EVALUATION OF THE EPIDEMIOLOGICAL TRAINING IN KAZAKHSTAN CONDUCTED BY THE CENTERS FOR DISEASE CONTROL AND PREVENTION CENTRAL ASIA REGIONAL OFFICE, 2011 CDEP ESPECIALLY DANGEROUS PATHOGEN DETECTION AND RESPONSE PROGRAM (FORMER TADR)

Keywords: training, workers SES, test, implement programs.

Abstract. Epidemiologists of the sanitary epidemiological and antiplaque services engaged in epidemiological surveillance of especially dangerous infectious diseases in Kazakhstan participated in a 5-week training within the Especially Dangerous Pathogen Detection and Response Program (Cooperative Biological Engagement Program (CBEP), former TADR). The training course was developed by the CDC specialists and included standard case definitions of especially dangerous infections (EDI), epidemiological surveillance and data analysis, basics of biostatistics, elements of analytical epidemiology and basics of EpiInfo statistical package. The trainings were launched in 2008 and two groups of epidemiologists were trained by 2011, who were able to use obtained knowledge and skills in practice.

The objective of the study was to assess the level of practical application of the obtained knowledge and skills, to determine the level of satisfaction with the training and to generate suggestions as to how to improve it.

A training evaluation tool was developed based on its objectives and similar evaluation conducted earlier by the CDC specialists. The assessment also included a verification component as a way to determine the validity of some responses. The assessment was conducted among the trained individuals who attended the training in the previous year or earlier, and who had still been employed in the sanitary epidemiological or antiplaque services as epidemiologists after the completion of the training.

According to the survey results, which included 22 epidemiologists, such modules as ‘data presentation’ (100% of participants applied in practice the knowledge gained from this module) and ‘outbreak detection and investigation’ (75%) were applied in practice best of all. EpiInfo (25%), and the ‘elements of analytical epidemiology (13%) were used more rarely. The ‘biostatistics’ module was not used by the specialists of the sanitary epidemiological service.

In the antiplaque service, the biostatistics and EpiInfo modules were used by 50% of training participants; elements of analytical epidemiology – by 36% of all participants. The outbreak detection and outbreak investigation modules were used in practice by 21% and 50% of participants accordingly. According to direct supervisors of the training participants, 17 (77%) of participants demonstrated positive changes in their knowledge and skills; 21 (95%) indicated that the training was useful. After completion of the training, 5 (22%) participants said they would like to get help at their workplace during outbreak investigations and data analysis so that they could continue applying these skills in practice independently in the future.

Training materials were successfully used in practice. For better use of skills on biostatistics, analytical epidemiology and EpiInfo, it is necessary to continue training at a workplace through the implementation of joint projects, outbreak investigations, and data analysis.
Introduction

The Dangerous Pathogen Detection and Response Program (CBEP), former TADR, is implemented in Kazakhstan on the basis of the intergovernmental agreement between Kazakhstan and the USA. One of the program's objectives is to improve the epidemiological surveillance system for especially dangerous pathogens in Kazakhstan. This assumes strengthening and standardization of epidemiological surveillance components, improvement of case detection and confirmation as well as introduction of the elements of analytical epidemiology to implement surveillance. These goals can be achieved by means of developing a staffing potential of specialists involved in epidemiological surveillance, such as clinicians, laboratory specialists and epidemiologists.

To achieve this objective, in 2005 under the program’s implementation, a team of experts from CDC Atlanta together with their colleagues from CDC/Central Asia regional office developed materials for the epidemiology module. The goal of these materials and further training was for trainees to develop an understanding of important concepts and methods in epidemiology as well as of epidemiological skills used in epidemiological surveillance. Upon the completion of this course, trainees were expected to raise their professionalism in the detection, investigation and control of infectious disease outbreaks and prevention of outbreaks in the future. An additional objective was to change a conceptual approach to prevention and control of infectious diseases by introducing modern western approaches used in the training materials for trainees.

The training materials were approved by specialists of the Ministry of Health of the Republic of Kazakhstan. It was recommended that epidemiologists dealing with especially dangerous infections from of the sanitary epidemiological service (SES) and the antiplaque service (APS) be trained within the program.

Training Structure

The training curriculum included five one-week modules:

Module 1: Basics of biostatistics, introduction into epidemiological surveillance, presentation of epidemiological data;

Module 2: Epidemiological data analysis, systematic approach to outbreak investigations;

Modules 3-4: Analytical methods in epidemiology

Module 5: Analytical software EpiInfo.

Each module consisted of in-class work, including lectures and case studies. After each module trainees were asked to complete a set of exercises at home in order to apply theoretical materials in practice. Trainees had to present results of their work on the first day of the following module for a group discussion.

The overall course duration for one group of participants was 6-8 months.

Prerequisites for Evaluation

To ensure long-term success of the epidemiological training program, we had to determine, whether the objectives were achieved and to what extend and what changes had to be made in the curriculum of future trainings.

There is no generally accepted or best way to conduct evaluation in post-diploma education. Usually, evaluation is based on the Kirkpatrick's methodology, which assumes testing of knowledge prior to and after the training (a pre- and a post-test), evaluation at a workplace, where possible, and ideally an evaluation of the impact the training had on the practical result. We used the first evaluation method for our training evaluation, however, for this study specifically we used the second approach (evaluation at a workplace).

Evaluation should provide answers to the following question: what is short and medium-term impact of a 5-week course on the practical skills of trainees of the first two cohorts in Kazakhstan.
We have established the following objectives:

1. Describe changes that took place in the day-to-day activities of trainees as a result of their participation in a 5-week course;
2. Determine the overall level of satisfaction of trainees with the course's content and structure (for example, topics not covered in the course, ideas for improvement);
3. Determine trainees' perception of the benefits/relevance of the course in their working environment/conditions (for example, the most/least useful topics covered during the course);
4. Determine barriers in implementation of activities aimed at changing the course content/materials.

It is obvious that practical application of skills and knowledge gained by the trainees are affected not only by the quality and content of trainings, but also by external factors. Recognizing this fact, we designed this study in such a way as to identify some internal and external factors affecting the use of skills and knowledge obtained during the training.

**Methods**

To create an evaluation tool, we reviewed and modified a questionnaire developed by specialists from the Division of International Health, CDC Atlanta (unpublished materials 'Further Evaluation of a 5-Week Epidemiology, Biostatistics and Scientific Communications Course For Russian-Speaking Healthcare Workers in Central Asia). We decided to use this tool, since the existing training curriculum was very similar to the curriculum of the training provided by CDC/Atlanta, likewise, the targeted audience was also very similar in terms of its level of education and areas of expertise within the healthcare sector. A combination of ordinal and nominal variables was used in the questionnaire.

Evaluation included a verification component as a means of determining the validity of some responses. This component was used for questions, which were aimed at measuring direct changes of activities in the four training modules – epidemiology, epidemiological surveillance, biostatistics and computer use. The confirmation process assumed report preparation, data and database analysis, etc. with the demonstration of those measurements, which became possible as a result of the training. Whenever possible, interviewers retained copies of materials confirming statements provided.

The study tool was first tested by CDC/CAR specialists and its pilot was tested at the (Scientific and Practical Center for Epidemiological Inspection and Monitoring) SPCEIM. Upon the approval of the Committee of the State Sanitary and Epidemiological Surveillance (CSSES), the survey was conducted by the graduates of the CDC/CAR Field Epidemiology Training Program in April 2011. The database was created and analyzed using EpiInfo 2002 analytical software. Fisher's exact test was used to evaluate statistical significance.

**Results**

**Description of the Study's Population**

Out of 30 individuals, who completed the training in 2008 and 2009, 22 (73%) continued working in the State Epidemiologic Surveillance Service or the Anti-plague service (APS) as epidemiologists. Out of the rest, 1 (5%) retired, 3 (14%) was providing a post-diploma training for epidemiologists, 4 (18%) changed jobs. Therefore, only 22 individuals were able to apply in practice the skills and knowledge that they gained during the training.

Out of 22 interviewed trainees, 8 (36%) worked in sanitary-epidemiological departments or the RSES, 7 (32%) in anti-plague stations, NS 7 (32%) at Kazakh Scientific Center for Quarantine and Zoonotic Diseases (KSCQZI). There were 13 (59%) females; with the average age of 48 years (median – 52 years of age), ranging between 26 and 68.
Employees of the SES dedicated 37% of their time to epidemiological surveillance, while employees of APS dedicated 16% of their time to epidemiological surveillance.

Specialists of the anti-plague service were spending 26% of their time on labora-
tory-related activities, SES – 0%; SES specialists were devoting 20% of their time to organizational work, while specialists of the APS were devoting only 5% of their time to organizational work (Diagram 1).

**Sanitary Epidemiology Service**

**Antypague service**

Diagram 1 – Average time spent by type of activities by SES and APS Employees

**Evaluation of importance of training modules in performing job responsibilities**

According to the responses provided, 90-95% of the participants found the following modules 'very important' or 'important': epidemiological surveillance, descriptive epidemiology, data analysis, elements of analytical epidemiology, outbreak detection and investigation; 80-85% of the participants rated similarly the following modules: standard case definition and biostatistics; and 68% found EpiInfo very important (Diagram 2).

Diagram 2 – Importance of training modules in preforming job responsibilities according to responses provided by the graduates of the 2008-2009 5-week epidemiological training (n=22)
Analysis of the practical application of skills and knowledge gained during the training

Once responses were verified, it was determined that the following training modules were best introduced in the practice of the SES: data presentation – 100% and outbreak detection and investigation – 75% (95% CI, 36%-97%). The biostatistics module was not used in day-to-day work of SES specialists; 13% of SES participants applied the elements of analytical epidemiology in practice (95% CI, 3%-65%) (Table 1a). Half of participants from the antiplaque service used the biostatistics and EpiInfo modules (50%, 95%CI, 23%-77%), 36% of them used elements of analytical epidemiology. Such modules as ‘outbreak detection’ and ‘outbreak investigation’ – 50% (95% CI, 23%-77%) were used the least– 21% (95% CI, 5%-51%) and 50% (95% CI, 13%-65%) respectively. (Table 1b). Comparison of the level of use of training modules by specialists from the two services showed that the outbreak detection module was used 3.6 times more often (p=0.02) by SES specialists, while the biostatistics module was used more often by APS specialists. There was a statistically insignificant difference between the following modules: data analysis was used 1.3 times more often by SES specialists, while the outbreak investigation was used 1.5 times more often by APS specialists. APS specialists used the elements of analytical epidemiology and EpiInfo 2.8 and 2 times more often respectively.

The surveyed SES specialists provided the following reasons as to why biostatistics was not used in practice: 'were not sure whether they would be able to apply this module on their own' – 2 (25%), 'did not have enough knowledge' – 1 (13%), 'insufficient time' – 2 (25%) and 'not part of job responsibilities' – 1 (13%). Four (29%) of the APS participants believed that the biostatistics module 'was not part of their job responsibilities'; 6 (75%) of SES specialists 'did not have enough time' to use EpiInfo, while 3 (21%) of the APS specialists indicated that 'it was not a part of their responsibilities' (Table 2).

<table>
<thead>
<tr>
<th>Knowledge and Skills</th>
<th>Used by (abs.)</th>
<th>%</th>
<th>95% CI</th>
<th>95% CI</th>
<th>Verification (responses, abs.)</th>
<th>%</th>
<th>95% CI</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard case definitions</td>
<td>8</td>
<td>100%</td>
<td>63%</td>
<td>0%</td>
<td>5</td>
<td>63%</td>
<td>25%</td>
<td>92%</td>
</tr>
<tr>
<td>Data analysis</td>
<td>8</td>
<td>100%</td>
<td>63%</td>
<td>0%</td>
<td>5</td>
<td>63%</td>
<td>25%</td>
<td>92%</td>
</tr>
<tr>
<td>Outbreak detection</td>
<td>6</td>
<td>75%</td>
<td>35%</td>
<td>97%</td>
<td>6</td>
<td>75%</td>
<td>35%</td>
<td>97%</td>
</tr>
<tr>
<td>Outbreak investigation</td>
<td>7</td>
<td>88%</td>
<td>47%</td>
<td>100%</td>
<td>6</td>
<td>75%</td>
<td>35%</td>
<td>97%</td>
</tr>
<tr>
<td>Elements of analytical epidemiology</td>
<td>1</td>
<td>13%</td>
<td>0%</td>
<td>53%</td>
<td>1</td>
<td>13%</td>
<td>0%</td>
<td>53%</td>
</tr>
<tr>
<td>Data presentation</td>
<td>8</td>
<td>100%</td>
<td>63%</td>
<td>0%</td>
<td>8</td>
<td>100%</td>
<td>63%</td>
<td>0%</td>
</tr>
<tr>
<td>Article/abstract preparation</td>
<td>7</td>
<td>88%</td>
<td>47%</td>
<td>100%</td>
<td>7</td>
<td>88%</td>
<td>47%</td>
<td>100%</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>37%</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>37%</td>
</tr>
<tr>
<td>EpiInfo</td>
<td>2</td>
<td>25%</td>
<td>3%</td>
<td>65%</td>
<td>2</td>
<td>25%</td>
<td>3%</td>
<td>65%</td>
</tr>
</tbody>
</table>
Table 1b – Knowledge and Skills Used in Practice According to Responses of the APS Participants, Verified (n=14)

<table>
<thead>
<tr>
<th>Knowledge and Skills</th>
<th>Used by (abs.)</th>
<th>%</th>
<th>95% CI LL</th>
<th>95% CI HL</th>
<th>Verification (responses, abs.)</th>
<th>%</th>
<th>95% CI, LL</th>
<th>95% CI HL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard case definitions</td>
<td>11</td>
<td>79%</td>
<td>49%</td>
<td>95%</td>
<td>8</td>
<td>57%</td>
<td>29%</td>
<td>82%</td>
</tr>
<tr>
<td>Data analysis</td>
<td>11</td>
<td>79%</td>
<td>49%</td>
<td>95%</td>
<td>7</td>
<td>50%</td>
<td>23%</td>
<td>77%</td>
</tr>
<tr>
<td>Outbreak detection</td>
<td>4</td>
<td>29%</td>
<td>8%</td>
<td>56%</td>
<td>3</td>
<td>21%</td>
<td>5%</td>
<td>51%</td>
</tr>
<tr>
<td>Outbreak investigation</td>
<td>9</td>
<td>64%</td>
<td>35%</td>
<td>87%</td>
<td>7</td>
<td>50%</td>
<td>23%</td>
<td>77%</td>
</tr>
<tr>
<td>Elements of analytical epidemiology</td>
<td>7</td>
<td>50%</td>
<td>23%</td>
<td>77%</td>
<td>5</td>
<td>36%</td>
<td>13%</td>
<td>65%</td>
</tr>
<tr>
<td>Data presentation</td>
<td>13</td>
<td>93%</td>
<td>66%</td>
<td>100%</td>
<td>12</td>
<td>86%</td>
<td>57%</td>
<td>96%</td>
</tr>
<tr>
<td>Article/abstract preparation</td>
<td>12</td>
<td>86%</td>
<td>57%</td>
<td>96%</td>
<td>9</td>
<td>64%</td>
<td>35%</td>
<td>87%</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>8</td>
<td>57%</td>
<td>29%</td>
<td>82%</td>
<td>7</td>
<td>50%</td>
<td>23%</td>
<td>77%</td>
</tr>
<tr>
<td>EpiInfo</td>
<td>10</td>
<td>71%</td>
<td>42%</td>
<td>92%</td>
<td>7</td>
<td>50%</td>
<td>23%</td>
<td>77%</td>
</tr>
</tbody>
</table>

Table 2 – Reasons for Not Using Skills by SES and APS Specialists (n=22)

<table>
<thead>
<tr>
<th>Knowledge and skills</th>
<th>Biostatistics</th>
<th>Elements of analytical epidemiology</th>
<th>EpiInfo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SES</td>
<td>AP S</td>
<td>SE</td>
</tr>
<tr>
<td></td>
<td>Abs. %</td>
<td>Abs. %</td>
<td>Abs. %</td>
</tr>
<tr>
<td>Lack of confidence in own abilities to implement this module</td>
<td>2 25%</td>
<td>1 7%</td>
<td></td>
</tr>
<tr>
<td>Not enough knowledge</td>
<td>1 13%</td>
<td>0 0%</td>
<td></td>
</tr>
<tr>
<td>Not enough time</td>
<td>2 25%</td>
<td>0 0%</td>
<td>3 38%</td>
</tr>
<tr>
<td>Not part of responsibilities</td>
<td>1 13%</td>
<td>4 29%</td>
<td>1 13%</td>
</tr>
<tr>
<td>Did not give a response</td>
<td>2 25%</td>
<td>2 14%</td>
<td>3 38%</td>
</tr>
<tr>
<td>Applied the skill</td>
<td>0 0%</td>
<td>7 50%</td>
<td>1 13%</td>
</tr>
<tr>
<td>Total*</td>
<td>9 100%</td>
<td>14 100%</td>
<td>8 100%</td>
</tr>
</tbody>
</table>

*amounts exceed 100% due to rounding

Five out of 22 (22%) participants indicated that they would like to receive assistance at their workplace during outbreak investigations and data analysis upon the completion of training. 2 (9%) would like to attend an additional training, 1 (5%) would like to be additionally trained in analytical epidemiology to be able to apply the skills in practice independently in the future (Table 3).
Table 3 – Satisfaction with the Course and Recommendations as to How to Improve Practical Application

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include a section on mapping into the EpiInfo module</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Additional training</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Additional training on analytical epidemiology</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Joint outbreak investigation, assistance at the workplace by CDC specialists</td>
<td>5</td>
<td>22%</td>
</tr>
<tr>
<td>Provision of computers</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Provision of special literature</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Meetings with trained epidemiologists to exchange experience</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>No recommendations</td>
<td>9</td>
<td>41%</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>100%</td>
</tr>
</tbody>
</table>

According to three (14%) APS participants, the content of the course should be changed for participants from the APS. Some other recommendations were provided as to how the course could be changed (Table 4).

Table 4 – Suggestions as to How to Improve the Course

<table>
<thead>
<tr>
<th>Suggestions as to How to Improve the Course</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase the course duration</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Use examples from Kazakhstan in lectures</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Reduce the time between modules and conduct the training in another place different from a workplace</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Make a group size smaller</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Increase a number of exercises and reduce a number of lectures</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Specialists from district SES should be trained as well</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>The course should be changed for APS participants (include epizoological segment, dispersion analysis, GIS)</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Use PC to build charts and diagrams</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Discuss the training content with training participants</td>
<td>2</td>
<td>9%</td>
</tr>
<tr>
<td>Do not include participants of the preretirement age</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Total number of respondents</td>
<td>22</td>
<td>100%</td>
</tr>
</tbody>
</table>

Changes in career

18 (82%) of respondents indicated that they had positive changes in career: 4 (18%) were promoted, 9 (41%) felt their colleagues started treating them as highly qualified specialists, 1 (4%) specified that he/she had developed contacts with the CDC office, 4 (18%) received leading positions. According to the responses provided by the training participants, 11 (50%) of them felt that their participation in this training helped improve public health in the area where they worked.

After the training, 16 (72%) of participants shared training materials with their colleagues; 14 (64%) participants conducted their own trainings, where they covered some topics using these training materials.

Participants’ supervisors believed that 17 (77%) participants demonstrated positive changes in their knowledge and skills while 21 (95%) indicated that the training was useful.

Discussion

80-95% of the participants indicated that all modules of the training were ‘very im-
important’ or 'important' except for EpiInfo (68%). Despite the fact that EpiInfo allows to accurately analyze data and do it more efficiently using statistical significance value, and data description was indicated as an important training module. This shows that specialists do not use EpiInfo often in their work and therefore do not fully understand the benefits of the software, which is confirmed by our findings. EpiInfo was introduced into SES practice by 25%, and into APS practice by 50%. 6 (67%) The SES specialists identified a lack of time as a barrier to practical application of EpiInfo in their work. It should be noted that the use of the software would accelerate routine work in the field, which is currently performed with the help of a calculator or in rare cases with the help of Microsoft Excel.

Majority of the training modules were successfully implemented in practice. However, modules related to descriptive epidemiology, epidemiological surveillance system standardization, outbreak detection and investigation were better introduced in SES (63-100%). This can be easily explain if we consider the fact that epidemiological surveillance for human diseases is the foundation of responsibilities of this service (37% of time), moreover, it also deals with outbreak investigations.

The APS does not have the capacity to detect outbreaks of human diseases, but rather detects epizootic diseases among vectors. Most likely this can explain why the outbreak detection module was 3.6 times more effectively understood and introduced by the SES specialists with the statistical significance of p=0.02.

SES specialists experienced difficulties in implementation of such modules as biostatistics, elements of analytical epidemiology (13%) and EpiInfo (25%), although the APS specialists managed to find a better practical application for these modules (a statistically significant difference with respect to introduction into biostatistics (p=0.02)). This is most likely attributed to the experience related to performance of research activities and a better understanding of how the knowledge obtained can be used in practice. The training participants indicated that in order to improve practical application of these modules they would need assistance at their workplaces during data analysis and outbreak investigation, which will help them better understand how to use gained theoretical knowledge in practice.

The majority (95%) of managers of the trained specialists believed that the training was useful; 75% of the managers noticed positive changes in practical work.

Conclusion

The content of the 5-week training course to a great extend concurs to responsibilities of specialists of the SES of the oblast and republican levels engaged in EDI epidemiological surveillance. Some parts of the training can be marginally recommended to specialists of the anti-plaque service, who are involved in EDI outbreak epidemiological investigations dealing with data collection and analysis, protocol development, research projects, i.e. for KSCKZI specialists.

References
RESULTS AND PERSPECTIVES OF HIGHLY-SPECIALIZED MEDICAL CARE IN THE RESEARCH-CLINICAL CENTER FOR CARDIAC SURGERY AND TRANSPLANTOLOGY IN TARAZ

Key words: cardiac surgery, highly-specialized medical care, congenital and acquired cardiac defect, coronary artery bypass surgery.

Abstract. Much emphasis is put on prevention and treatment of cardio-vascular diseases in the country, because these pathologies are one of the main reasons for premature death and disability among population.

Establishment of cardiac surgery center in Taraz means cardiac surgery development on a program basis and is sign of state attention and support.

The article presents main results of 5-year activity of the Cardiac surgery center for the period of 2008-2012. As a result of modern diagnostics and surgical treatment technologies implementation, the Center does a wide range of surgeries for congenital, acquired cardiac defects and myocardium revascularization. The indicators of surgical activity of the Center are improving with each year. If in 2008 there were 152 surgical patients, in 2009-304. In 2010 – 401, in 2011-351 and in 2012 - 245 surgeries done.

Statistical data analysis of the country on the topic of surgical activities for heart surgery in 2010 has shown that our center took the 3rd place after cardiac surgery centers of Astana and Almaty. In the strategic perspective the Center is planning to conduct research and educational activities and on 13 May 2013 it was transformed into Research-clinical center for cardiac surgery and transplantology with increase in scope of activity.

Introduction

Much emphasis is put on prevention and treatment of cardio-vascular diseases in the country, because these pathologies are one of the main reasons for premature death and disability among population.

In Kazakhstan 56% of mortality causes are related to cardio-vascular pathologies, of which up to 80000 thousand people die annually. [1]

It should be noted that cardio-vascular diseases have a trend towards youthification, people of active working age are getting sick more often, i.e. it has become a social-economic problem in the country and there is a need to take drastic measures. In order to solve this problem on a national scale under the leadership of the head of state N.A. Nazarbayev there was a state program adopted: «Program of development and improvement of cardiac and cardiac surgery service for 2007-2009», which is continued to be successfully implemented.[2]

Establishment of cardiac surgery center in Taraz means cardiac surgery development on a program basis and is sign of state attention and support.

Materials and research methods

In Taraz city of Zhamby region since 2008 «Center for cardiac surgery» LLP has been actively working under the leadership of professor S. Dzhoshybayev MD, who provides highly-specialized cardiac surgical care to the population of the country. As a result of modern diagnostics and surgical treatment technologies implementation, the Center does a wide range of surgeries for congenital, acquired cardiac defects and myocardium revascularization (CABG).
94% of surgeries are done on an open heart in the conditions of bypass. In total there are more than 100 different surgeries done on the heart and large vessels in the Center.

**Results and discussion**

The Center provides highly-specialized medical care to the population of southern region of the country and conducts big organizational-methodological and consultative-treatment work. Patients come for surgeries to the center from different regions of Kazakhstan, as well as neighboring countries (Table – 1).

**Table 1 – In-patient treatment in the Center for 5 years**

<table>
<thead>
<tr>
<th>№</th>
<th>Regions</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Zhambyl region</td>
<td>157</td>
<td>329</td>
<td>279</td>
<td>283</td>
<td>251</td>
</tr>
<tr>
<td>2</td>
<td>South-Kazakhstan region</td>
<td>63</td>
<td>83</td>
<td>258</td>
<td>194</td>
<td>114</td>
</tr>
<tr>
<td>3</td>
<td>Kyzylorda region</td>
<td>4</td>
<td>5</td>
<td>17</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Atyrau region</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Mangystau region</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Almaty region</td>
<td>11</td>
<td>21</td>
<td>17</td>
<td>29</td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>Akmola region</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Aktove region</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Uzbekistan</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Kyrgyzstan</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>244</td>
<td>442</td>
<td>580</td>
<td>532</td>
<td>397</td>
</tr>
</tbody>
</table>

Patient oriented principles of medical care have been implemented in the Center.

In practical work the indicators of the Center activity are improving with each year. If in 2008 there were 152 surgical patients, in 2009-304, in 2010 – 401, in 2011-351 and in 2012 - 245 surgeries done (Table – 2).

**Table 2 – Amount of surgeries in the period of Center’s work**

<table>
<thead>
<tr>
<th>Years</th>
<th>Pacemaker</th>
<th>CABG</th>
<th>CHD</th>
<th>ACD</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>0</td>
<td>1</td>
<td>78</td>
<td>45</td>
<td>28</td>
<td>152</td>
</tr>
<tr>
<td>2009</td>
<td>0</td>
<td>14</td>
<td>181</td>
<td>109</td>
<td>0</td>
<td>304</td>
</tr>
<tr>
<td>2010</td>
<td>0</td>
<td>33</td>
<td>243</td>
<td>126</td>
<td>0</td>
<td>402</td>
</tr>
<tr>
<td>2011</td>
<td>2</td>
<td>15</td>
<td>238</td>
<td>96</td>
<td>0</td>
<td>351</td>
</tr>
<tr>
<td>2012</td>
<td>13</td>
<td>146</td>
<td>82</td>
<td></td>
<td></td>
<td>241</td>
</tr>
</tbody>
</table>

Statistical data analysis of the country on the topic of surgical activities for heart surgery in 2010 has shown that our center took the 3rd place after cardiac surgery centers of Astana and Almaty, which is presented in Table – 3.
<table>
<thead>
<tr>
<th>№</th>
<th>Name of organizations and regions</th>
<th>Name of surgery</th>
<th>CABG</th>
<th>Valve replacement</th>
<th>CHD</th>
<th>Total of surgeries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National research medical center</td>
<td></td>
<td>625</td>
<td>256</td>
<td>540</td>
<td>1421</td>
</tr>
<tr>
<td>2</td>
<td>National research surgery center</td>
<td></td>
<td>118</td>
<td>147</td>
<td>294</td>
<td>559</td>
</tr>
<tr>
<td>3</td>
<td>«Cardiac surgery center» LLP Taraz</td>
<td></td>
<td>33</td>
<td>126</td>
<td>243</td>
<td>402</td>
</tr>
<tr>
<td>4</td>
<td>Karaganda regional hospital</td>
<td></td>
<td>90</td>
<td>36</td>
<td>125</td>
<td>251</td>
</tr>
<tr>
<td>5</td>
<td>West-Kazakhstan medical university</td>
<td></td>
<td>58</td>
<td>34</td>
<td>37</td>
<td>129</td>
</tr>
<tr>
<td>6</td>
<td>SMME «CCC» Almaty</td>
<td></td>
<td>109</td>
<td>4</td>
<td>1</td>
<td>114</td>
</tr>
<tr>
<td>7</td>
<td>Akmola regional hospital</td>
<td></td>
<td>70</td>
<td>2</td>
<td>5</td>
<td>77</td>
</tr>
<tr>
<td>8</td>
<td>East Kazakhstan region</td>
<td></td>
<td>21</td>
<td>18</td>
<td>21</td>
<td>60</td>
</tr>
</tbody>
</table>

The Center is staffed by highly qualified staff – cardiac surgeons, cardiologists, anesthesiologists, functional and laboratory diagnostics physicians. There are two professors (MD), 2 cand. Sci. med., physicians of the highest qualification category.

The clinic is equipped with modern automated medical equipment. The whole complex of non-invasive assessment methods is done in the center – echo CG, day-long monitoring of blood pressure, Holter ECG monitoring, step-tests, as well as a wide range of clinical and biochemical tests, coagulation indicators, acid-base balance and blood electrolytes.

Cardiac surgery center’s activity is aimed at provision of high quality highly-specialized medical care to the patients with cardio-vascular diseases, including children, on the level of international standards.

Center staff uses team approach. The management gives specialists an opportunity for professional, scientific and career growth, acquiring experience of working according to international standards, improvement of qualification and knowledge.

Our corporate culture is based on performance, intellect, freedom, creativeness, mutual trust, respectful and humane attitude towards each other and especially to patients.

It is known that cardiac surgeries are one of the resource intensive expensive types of medical care. That is why there is state support provided for treating the patients with cardio-vascular diseases within the framework of quotas in the Republic of Kazakhstan.

Investments into development of hi-tech medicine in Kazakhstan allowed to return millions of dollars to the country, especially important is the fact that patients have an opportunity to get highly specialized treatment at home.

It should be noted that the main driver for targeted cardiac surgery development in each country is the growing need for heart surgery. Statistics shows that in Zhambyl region as well the number of patients in need of surgical treatment of heart diseases is constantly growing, therefore pushing medical community, health care organizers to more active and intensive ways of implementing this type of care. In this aspect such new need is the main driver for targeted development of own cardiac surgery concept, implementing the development of cardiac surgery service on a program basis. Here such an important factor should be noted as enthusiasm of leading cardiac surgeons-scientists. Thanks to them it has become possible to have targeted accumulation of scientific and practical experience in surgical treatment of heart diseases. There is no secret that personalities, authority, experience and devotion play an important role in each sphere of science and practical activities.
The management of the center works on professional development of the staff by means of participating in scientific-practical conferences, congresses, held on a national and international level. The staff members actively participate in trainings, master-classes and workshops in the country. There is exchange of experience with other cardiac surgery organizations of Astana, Almaty, Karaganda, Shymkent and other. Young doctors after graduating Medical schools do internship, residency, post-graduate and doctorate studies in the Center. Practical regional conference has been organized by the Center staff for pediatricians, cardiologists and anesthesiologists. There is «Cardiologists, intervention cardiologists and cardiac surgeons’ society» organized in the region. The main purpose of the society is to further develop and improve medical science and practice in the field of cardiology, intervention cardiology, cardiac surgery and angiosurgery, enforcement and protection of professional, economic, social and other rights of its members.

With support from the Ministry of healthcare the Center management has organized a III congress of cardio-vascular surgeons of Central Asia in Astana in 2009, which had large scientific and practical significance, raised the image and prestige of cardiac surgery service in Kazakhstan.

Since 2010 implementation of a Single national healthcare system has started in Kazakhstan (SNHS), providing patients with a right to choose a physician and medical organization. This will create competitive environment among the hospitals, hence raising the quality of medical care and at the same time keep the market prices for it. SNHS ensures transparency of medical services provision and is oriented towards final result.

Conclusions

1. Our competitive advantage is a rather high technological equipment and qualification of the cardiac surgeons, anesthesiologists and other specialists, participating in the surgery.

2. The Center intends to implement modern and efficient cardio-vascular diseases diagnostics and treatment methods, therefore easing the suffering of the patient and improving their quality of life.

3. In the research perspective the Center works on fundamental research to identify associate connection between the cardio-vascular diseases and histocompatibility antigen in order to prevent these pathologies.

4. In the strategic perspective the Center intents to expand diagnostics and surgical methods, implementation of heart defects correction in young children from their birth is planned.

5. In the near future Taraz will become a Center of a rather large scientific-medical center, where there is a synergetic effect of 3 factors – education, research and practice, it will raise healthcare level not only in the region, but in the country as well.

References


EPIDEMIC PROCESS CHARACTERISTICS OF NOSOCOMIAL INFECTIONS IN MULTI-PROFILE IN-PATIENT CLINIC

Key words: nosocomial infections, epidemiology, in-patient clinic.

Abstract. The biggest share of nosocomial infections (NCI) is happening in in-patient clinics. Frequency of such infections is no less than 5%.

The aim of this study is to assess epidemiologic manifestations of nosocomial infections in multi-profile in-patient clinic.

Retrospective analysis of epidemic situation with nosocomial infections was done in different departments of Military clinical hospital of the Ministry of defense of the Republic of Kazakhstan and prospective observation of the patients, undergoing the treatment there. Incidence indicators for each studied year were calculated in the process of research, as well as monthly morbidity and average indicators.

Total morbidity (incidence) of NCI in all departments was 0,78±0,13 per 1000 treated patients; however in the ICU it significantly exceeded cumulative indicator and was 205,45±9,64, i.e. approximately one in five patients, who was in ICU, was infected by nosocomial strain or their association. It was shown that there is season nature of fall-winter season in surgical departments and summer-fall season nature in internist departments. Infections of surgical field were dominating in the nosocomial infections structure (60,16%).

Introduction

Nosocomial infections and control over them are a global problem. Besides increasing additional morbidity and mortality among hospitalized patients, nosocomial infections increase the cost of health care services due to additional prescription of anti-bacterial medications and increased treatment time [1]. Prevalence of nosocomial infections in general is higher in developing countries with limited resources; therefore social economic burden of these infections is even higher [2-5].

The biggest share of nosocomial infections incidents is in in-patient care. The frequency of these infections is no less than 5% [6]. This defines topicality and social significance of studying the epidemiologic manifestations of nosocomial infections in in-patient care as a foundation for developing methodological bases and organization of infectious complications prevention among the patients.

The aim of this study is to assess epidemiologic manifestations of nosocomial infections in multi-profile in-patient clinic.

Materials and methods

Data collection and results implementation was done on the basis of multi-profile clinic – Military clinical hospital of the Ministry of defense of the Republic of Kazakhstan – MCH MD RK (450 beds). The study was done for 7 years (2006-2012 included). Development mechanism and characteristics of epidemic process of nosocomial infections (NCI) was studied in surgical and therapeutic departments of MCH MD RK using the method of retrospective analysis of medical records and prospective observation of incoming patients.

As research materials the following was studied: in-patients medical records (form 003/y) for 2005-2012, physicians and patients surveys data in the MCH MD RK for the same period, epidemiologic investigation charts for cases of nosocomial infections (NCI) outbreaks, Infectious control commit-
In the process of research morbidity incidence indicators were calculated for each year, as well as monthly and average morbidity indicators.

Statistical analysis

The results were presented in the following form: average ± standard deviation or in the form of percent ration to the total number of patients. Morbidity incidence indicators were expressed as proportion per 1000 person years.

For continuous variables the mean values were compared by using unpaired-t-test for independent variables; α value was set as 0.05.

Data analysis was done in the free statistical package of R version 2.14.1 with graphic front-end RStudio version 0.97.332.

In order to identify the main trend in epidemic process development (growth, decrease) statistical series flattening was done by means of calculating theoretical level of morbidity levels with the least squares methods. For quantitative assessment of epidemic trend «average annual growth, decrease rates» indicators were used, expressed in per cents. In assessment of morbidity trend scale proposed by Belyakov V.D. et al. (1987) was used.

Results

Epidemic process of nosocomial infections is characterized by intensive progress. Retrospective analysis of health outcomes of 1768 patients, that were treated in-patiently from 2005 to 2012, has identified nosocomial infection in 369 people (20.87%).

Total morbidity (incidence) of NCI in all departments was 0.78±0.13 per 1000 patients; however in the ICU it significantly exceeded the cumulative indicator and was 205.45±9.64, i.e. approximately one in five patients, who received intensive care was infected by a nosocomial strain or association of them.

The share of outbreak component in the general structure of NCI morbidity was 32.4±2.0%, mainly because of the infections, caused by gram-negative dextrose non-fermenting bacteria (P. aeruginosa, P. cepacia, P. putida).

Analysis of annual NCI dynamics allowed to identify differences in morbidity levels fluctuation in different profile departments.

In surgical departments (including ICU) monthly distribution of annual NCI morbidity indicators showed their increase in the period from October to February.

Such seasonal distribution is not caused by biological reasons, it rather reflects dependency on the intensity of diagnostic and treatment process and development of NCI agents after multiple passages through organisms of susceptible people.

A different picture is seen in analysis of seasonal distribution in the internist profile departments. Increase in NCI morbidity is seen from July to October, which may be a proof of exchange between the hospital and extra hospital flora.

The level of NCI was stable in the longstanding dynamics for all 8 years of observation and was never below 0.5 per 1000 of patients. Thorough analysis of the reasons for sharp decrease of NCI morbidity, identified in 2009, has shown that there was a fact of non-reported cases, primarily as a result of attempts to conceal cases of purulent-septic infections (PSI) in delivery and surgical departments, as well as by means of registering nosocomial pneumonia cases as extrahospital.

We have done an assessment of total NCI incidence dynamics by means of calculating longstanding (8 year) linear epidemic trend. Flattening of statistical series allowed to find out that from 2005 to 2012 absolute increase in NCI morbidity was 0.055; morbidity growth rate in 8 years was 7.29%, and average annual morbidity increase rate was 0.89%, which is a reason to characterize the longstanding NCI epidemic trend as stable.

Despite higher NCI morbidity indicators in surgical departments, where the indicators
are more than 200 higher, analysis of its longstanding dynamics shows that from 2005 to 2012 absolute decrease of NCI morbidity in surgical departments was 19.96%; morbidity decrease rate for 8 years was 9.26%, and average annual morbidity increase rate was 1.21%, which gives grounds to talk about moderate decreasing trend in NCI morbidity in surgical departments.

In 2008 according to the order of the Head of MCH MD RK №205 «On organization of infectious control over nosocomial infections» there was a position of epidemiologist introduced in the hospital. Preventive and anti-epidemic activities have been done together with epidemiologist and bacteriologist, which led to decrease in NCI morbidity mainly by PSI.

In the NCI structure the following prevail: infections of the surgical field (PSI), infections of urinary tract and respiratory system (60.16%, 19.24% and 14.09%, respectively).

**Surgical field infections**

In 14 out of 222 patients (6.3%) NCI diagnosis was not officially registered; the cases were identified by us by indirect signs: development of inflammatory infiltrates, healing the wounds by secondary adhesion, local use of antiseptics.

Purulent complications are most frequently registered after appendectomy, cholecystectomy, laparotomy in suturing multiple lesions of parenchymal hollow organs of abdominal cavity (16.22%, 13.06% and 13.51% respectively).

Wound infection (57.66%), then wound dehiscence and abdominal abscesses were registered most frequently. Generalized form of PSI was seen in 3 patients, its frequency of occurrence being 1.35%.

It was established that purulent post-operative wounds increase the length of stay of a patient 2.2 times.

**Conclusions**

1. Longstanding dynamics of NCI morbidity for the period of 2005-2012 was stable (average annual decrease rate – 0.89%); season nature of fall-winter season in surgical departments and summer-fall season nature in internist departments was identified.

2. Infections of surgical field were dominating in the nosocomial infections structure (60.16%).

3. The share of outbreak component in the general structure of NCI morbidity was 32.4±2.0%, mainly because of the infections, caused by gram-negative dextrose non-fermenting bacteria (*P. aeruginosa, P. cepacia, P. putida*).

**References**

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ASSESSMENT OF MAIN ANTISEPTICS USE TO DEBRIDE POST-OPERATIVE STITCHES IN COMBINATION WITH CLARITHROMYCIN

Key words: biocides, clarithromycin, biofilms.

Abstract. Use of antiseptic solutions, contaminated with isolates forming biofilms P. cepacia, P. aeruginosa and other hydrophil nosocomial strains when debriding wounds, post-surgical sutures and even intact skin presents a high risk for development of nosocomial infections. There is description in the literature of capability of clarithromycin to inhibit creation of biofilm for a wide range of microorganisms, including the kinds that are non-reactive to this antibiotic.

The aim of the present study is to study bacterial growth-inhibitory activity of the previously studied biocides in relation to P. cepacia strains, forming the biofilm, isolated and in combination with clarithromycin.

The work consisted of two parts: experimental and clinical. In the experimental part bacterial growth-inhibitory activity of a range of biocides was studied (70% ethanol, 0.1% CHX, 5% iodine tincture and Rokal-10), as well as their ability to inhibit formation of biofilm of clinical isolates P. cepacia 1/2, 1/4, 1/8 and 1/16 minimal inhibiting concentrations and in combination with clarithromycin. In the clinical part of the study we have assessed new (incident) morbidity of the surgical field infections with use of iodine tincture for debridement isolated and with clarithromycin on a model of 425 cases of major surgical interventions in the Military clinical hospital of the MD RK.

Biocides do not have significant effect on the P. cepacia biofilm, which proves their significant germicidal effect only on the plankton-like cells. Clarithromycin increases the latter by means of eliminating protective effect of biofilm. This phenomenon has a dose-dependent nature and is maximally expressed if clarithromycin is combined with iodine tincture and Rokal-10.

An only statistically significant factor of nosocomial infections prevention in surgical patients was use of clarithromycin solution prior to debridement of surgical sutures with iodine tincture.

Introduction

It is known that leading protection mechanism with relation to biocides (antiseptics and disinfectants) of pseudomonades is biofilm. Special danger is presented, when biofilm is formed in artificial water systems of the hospital, like the condensates of the air conditioning system and artificial lung ventilation, wash bowls and bath tubs, medication solutions and biocides [1].

Use of antiseptic solutions contaminated with isolates, forming biofilm, P. cepacia, P. aeruginosa and other hydrophil nosocomial strains when debriding wounds, post-surgical sutures and even intact skin presents a high risk for development of nosocomial infections.

Clarithromycin is a half-synthetic 14-member macrolide antibiotic, a derivative of erythromycin. Observed side-effects of antibiotic in central nervous system (head ache, lightheadedness, anxiety, fear, insomnia, disorientation, hallucinations, psychosis, de-personalization, clouded consciousness) limit its peoral administration [2].

There is description in the literature of capability of clarithromycin to inhibit creation of biofilm for a wide range of microorganisms[3-5], including the kinds that are non-reactive to this antibiotic, for example,
**Candida albicans** [6, 7]. Effect of clarithromycin is known on formation of biofilm among representatives of the *Pseudomonas daceae*, Pseudomonas Aureginosa [8, 9].

Therefore, the aim of this part of research is to study bacterial growth-inhibitory activity of the previously studied biocides in relation to *P. cepacia* strains, forming the biofilm, isolated and in combination with clarithromycin.

**Materials and methods**

The work consisted of two parts: experimental and clinical

Populations of *P. cepacia*, characterized by the presence of biofilm formation feature were taken for the study, the optical density of which was 1.25 – 1.57 bel.

Bacterial growth-inhibitory activity of a range of biocides was studied (70% ethanol, 0,1% CHX, 5% iodine tincture and Rokal-10), as well as their ability to inhibit formation of biofilm of clinical isolates *P. cepacia* 1/2, 1/4, 1/8 and 1/16 minimal inhibiting concentrations and in combination with clarithromycin.

Study of bacterial growth-inhibitory activity of the biocides was done in a suspension experimen. Ability of the studied agents to inhibit biofilm was studied in the experiment in U-shape wells in 96-well polystyrene plate. After incubation at a temperature of 37°C for 24 hours the growth-support medium was suctioned out and the well was washed by phosphate buffer solution. Residual biofilm, formed during incubation, was colored by 100 mcL of 0,1% crystal-violet solution at a room temperature for 15 minutes. After crystal-violet solution removal and washing the well with triple-distilled water the colored biofilm was diluted with 200 mcL of 33% acetic acid. Then 125 mcL of solution was transferred to another 96-well plate (with flat bottom) and spectrophotometric analysis was done with wave length of 570 nm.

A positive control was acetoacetic solution of the biofilm of *P. cepacia* isolate, cultivated without addition of any biocides and clarithromycin, and a negative controller was distilled water.

Biofilm formation indicator was expressed in per cent and was calculated using the following formula:

\[
\text{ПОБ} = \frac{\text{ОП}_{570} - \text{ОП}_{0}}{\text{ОП}_{570} - \text{ОП}_{0}} \times 100,
\]

where

- ПОБ — biofilm formation indicator;
- ОП570 — optical density of positive control;
- ОП0 — optical density of negative control;
- ОП570б — optical density of biofilm after contact with biocides.

Or each new test of biocide biofilm formation was assessed in 10 samples with the same concentration. Data collected were processed using Student t-test and were expressed as a mean ± standard deviation.

In the clinical part of the study we have assessed new (incident) morbidity of the surgical field infections with use of iodine tincture for debridement isolated and with clarithromycin.

We have done a perspective cohort study of 425 cases of major surgical interventions in the Military clinical hospital of the MD RK. Consecutive debridement of surgical sutures by water-diluted clarithromycin in concentration of 50 mg/ ml and iodine tincture served as intervention (exposed group). Patients, whose surgical sutures were debrided only with iodine tincture, were serving as non-exposed group (non-exposed group).

Development of infection on the surgical field in 30 days after the surgery was an «outcome» criterion.

Exposed group included 212 cases, non-exposed — 213.

**Results**

When exposing *P. cepacia* culture to combination of biocides and clarithromycin the highest bacterial growth-inhibitory activity was shown by ethanol, iodine tincture and Rokal-10; CHX almost did not decrease
the number of CFU (picture 1). None of the tested biocides had any significant effect of formation of biofilm in strains of *P. cepacia* (Table 1).

The most significant decrease of biofilm optical density was caused by ethanol and iodine tincture in concentration 1/2 MIC (86,62±7,75% and 83,54±8,9%, respectively).

Clarithromycin caused statistically significant inhibition of biofilm formation in combination with all biocides, and dose-dependent effect was seen (Table 1).

### Table 1 — Effects of biocides isolated and in combination with clarithromycin on formation of *P. cepacia* biofilm

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Ethanol</th>
<th>CHX</th>
<th>Iodine tincture</th>
<th>Rokal-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 MIC</td>
<td>86,62±7,75</td>
<td>99,98±5,71</td>
<td>83,54±8,9</td>
<td>95,01±6,91</td>
</tr>
<tr>
<td>1/2 MIC + CM*</td>
<td>77,42±4,84</td>
<td>93,08±4,13</td>
<td>23,13±8,07</td>
<td>27,05±4,19</td>
</tr>
<tr>
<td></td>
<td>t = 3,18, p = 0,006 **</td>
<td>t = 2,63, p = 0,02</td>
<td>t = 15,89, p &lt; 0,001</td>
<td>t = 26,59, p &lt; 0,001</td>
</tr>
<tr>
<td>1/4 MIC</td>
<td>114,43±7,52</td>
<td>98,69±8,66</td>
<td>99,63±5,51</td>
<td>95,55±3,49</td>
</tr>
<tr>
<td>1/4 MIC + CM*</td>
<td>100,82±8,37</td>
<td>99,33±7,44</td>
<td>69,34±5,19</td>
<td>49,23±3,40</td>
</tr>
<tr>
<td></td>
<td>t = 3,83, p = 0,001</td>
<td>t = 0,18, p = 0,86</td>
<td>t = 12,66, p &lt; 0,001</td>
<td>t = 30,06, p &lt; 0,001</td>
</tr>
<tr>
<td>1/8 MIC</td>
<td>106,05±4,94</td>
<td>100,78±2,36</td>
<td>102,41±8,73</td>
<td>107,57±6,37</td>
</tr>
<tr>
<td>1/8 MIC + CM*</td>
<td>103,95±2,14</td>
<td>94,42±5,03</td>
<td>86,18±7,69</td>
<td>89,42±11,32</td>
</tr>
<tr>
<td></td>
<td>t = 0, p = 0,99</td>
<td>t = 3,1, p = 0,003</td>
<td>t = 4,41, p = 0,00035</td>
<td>t = 4,61, p = 0,0002</td>
</tr>
<tr>
<td>1/16 MIC</td>
<td>104,9±5,96</td>
<td>98,32±7,82</td>
<td>100,34±4,23</td>
<td>84,66±7,15</td>
</tr>
<tr>
<td>1/16 MIC + CM*</td>
<td>106,27±4,54</td>
<td>95,16±6,96</td>
<td>100,10±2,94</td>
<td>89,96±6,32</td>
</tr>
<tr>
<td></td>
<td>t = 0,89, p = 0,38</td>
<td>t = 0,96, p = 0,35</td>
<td>t = 0,86, p = 0,35</td>
<td>t = 1,65, p = 0,12</td>
</tr>
</tbody>
</table>

* CM — clarithromycin

** — statistical significance of the biofilm formation levels during incubation with clarithromycin and without it

The most significant optical density reduction of biofilm was seen in combinations of clarithromycin with iodine tincture and Rokal-10; and absence of effect in these combinations was only seen in cases of small concentration of the agents (1/16 MIC).

In clinical part it was established that although surgical intervention length in exposed group was statistically higher than in non-exposed group (66,72±4,93 minutes compared to 61,46±7,32 minutes, respectively; p < 0,001), severity of post-operative condition among patients was not different.

Surgical field infection frequency in exposed group was 2,03±0,54 per 100 surgeries, and in non-exposed group — 9,89±0,47 (t = 157, 91; p < 0,001). Multivariational analysis done before and after surgical intervention aimed at elimination of confounders, has not identified any additional factors of surgical infection development.

### Conclusions

1. Biocides do not have significant influence at P. Cepacia biofilm, which proves their significant germicidal effect only on the plankton-like cells. Clarithromycin increases the latter by means of eliminat—
ing protective effect of biofilm. This phenomenon has a dose-dependent nature and is maximally expressed if clarithromycin is combined with iodine tincture and Rokal-10.

2. An only statistically significant factor of nosocomial infections development among surgical patients was use of clarithromycin solution prior to debridement of surgical sutures with iodine tincture.

References


NEEDS ASSESSMENT IN ADDITIONAL TRAINING IN HEALTH PSYCHOLOGY

**Key words:** Health Psychology, specialists, psychologists, socially significant diseases, training.

**Abstract.** In the government Health Care Development Program "Salamatty-Kazakhstan" significant place is given to reduce the level of diseases caused by behavioral factors, improve adherence to the principles of healthy lifestyles, through a complex approach to prevention and increase control of behavioral risk factors. [1]

Numerous studies show a close relationship between such diseases as cardiovascular diseases, cancer, endocrine with an increased risk of mental health problems. Most often, patients from this group noted, PTSD, depression and anxiety disorders. [2,3]

And also complex psychological issues associated with the perception of body image, self-esteem, relationships with others. Behavioral problems such as low levels of adherence to treatment, negative beliefs about their own health, low motivation for self care, avoidance of health-promoting behaviors. [4]

For example, in some studies indicate that the risk of developing cancer patients depressive disorders ranges from 11%- 93% , depending on the localization of the disease. [5]. [6]. One study indicated that the risk of depression associated with 60% risk of developing diabetes. [7]. For patients after a heart attack, the risk of anxiety disorders is about 40%, 60% of depressive disorders [8, 9]. Also, for all groups of patients with co-occurring mental and psychological problem significantly increases the risk of premature mortality, a longer period of rehabilitation and social adaptation.[10]

**Introduction**

These circumstances make it necessary to expand the range of services and the provision of other than narrowly - medical, as well medico-social and psychological assistance. To team members are included in the same way than the doctors and nurses, social worker, psychologist, volunteers, patients and their families, community organizations. [11] Already begun systemic involvement of specialist from non-medical education to provide psycho-social care. [1] At this point in the health system of the Republic already has more than 500 psychologists. [12] Also in the program indicates the need for, training of psychologists and social workers in primary care according to international standards of education. [1]

Effective methods of reducing risk behaviors, as well as the rehabilitation of patients with chronic diseases, there are motivational interviewing and cognitive behavioral therapy, methods of self-regulation and stress management. In international practice, these objects are achieved by multidisciplinary teams that include psychologists, whose counseling and implement other interventions in these referral.

**Modern direction covering this range of services is health psychology**

Health psychology is the study of psychological and behavioral processes in health, illness and healthcare.[15] It is concerned with understanding how psychological, behavioral and cultural factors are involved in physical health and illness, in addition to the biological causes that are well understood by medical science. Psychological factors can affect health directly, such as stress causing the release of hormones such
as cortisol which damage the body over time and indirectly via a person's own behavior choices which can harm or protect health such as smoking or taking exercise. [16]

Division of Health Psychology, British Psychological Society, describe specialty health psychology as part of psychology, uses methods and techniques of psychology, and research methods to: strengthen and maintain health, prevent and overcome disease, identify the psychological factors associated with physical diseases, improve the health care system, the impact on health policy. [17]

Usually health psychology focuses on these issues: how to help people adapt to chronic illness, what factors affect a healthy diet, avoiding harmful habits such as stress associated with cardiovascular diseases, why patients routinely violate the scheme medication. [18]

Several programs analysis of additional education in medical psychology in Kazakhstan, revealed that the programs are designed for people with basic medical education, mainly psychiatrists and narcologist. There are some point in the regulatory framework which limiting the possibility of training for in psychology specialists. In the analyzed programs are not included topics on changing behavior and reducing risk factors. These features ensure the relevance of the study objectives, needs assessment for additional education for professional psychologist whose providing services of in health care organizations.

Methods

The study is realized in the framework of the master's thesis on the public health subject. Used qualitative research methods. The planned number of participants in the study are (n-75). The sample is formed of psychologists (n-41), doctors (n-17), and medical organizations clients (n-17). Sites of research: primary care organizations (n-27), narcology centers (n-15), other health organizations (n-36).

Analysis

For data analysis produced transcriptions of audio records, formed percentage comparison. Made a content analysis and ranking of served populations. SWOT-analysis.

Findings

The publication includes only the data obtained from primary care sites total (n-27), it’s include psychologists (n-23), physicians (n-3), primary care managers (n-1). Were conducted 4 focus groups and 3 in-depth interviews with psychologists, with doctors and manager 4 in-depth interviews were conducted. The territorial representation of psychologists are: Almaty (n-10), Astana (n-3), Almaty region (n-3), Pavlodar (n-3), Karaganda (n-2), Taraz (n-2). The percentage of the territorial distribution of professional psychologists is in Figure 1.

Figure 1 – Basic education psychologists bachelor in the following fields: educational psychologists (n-16), psychologists - (n-6), clinical psychologist (n-1).
91.3% mentioned the importance of developing counseling skills and psychological diagnosis. Also, 82.6% expressed the need to obtain knowledge on the impact of physical illness on patient’s mental and emotional state. 77% identified the need to acquire basic knowledge about the kinds of clinics and psychiatric disorders.

Of the 23 psychologists who participated in the study, 69.5% indicated that counseling elderly patients. With teenagers and young people are working 52.3%, 34.7% provide services to children. With cancer patients, 26.8%, 17.3% percent reported that taking part in involving patients in screening survey. Number of references obtained by content analysis in Table 1.

**Table 1 – Number of references obtained by content analysis**

<table>
<thead>
<tr>
<th>A group of patients</th>
<th>Number of References</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerontological patients</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Teenagers and young adults</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Children</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Cancer patients</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>4</td>
<td>5.5</td>
</tr>
<tr>
<td>Relatives of patients</td>
<td>4</td>
<td>5.5</td>
</tr>
<tr>
<td>Patients with TB</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>The patients after heart attack</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Patients after surgery</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Patients after insult</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Former prisoners</td>
<td>1</td>
<td>11</td>
</tr>
</tbody>
</table>

More than 82.6% of psychologists reported that use different methods of psychological tests. 30.4% use questionnaires. 56.5% of psychologists use drawing tests. For 73.6% are significant information in the area of principles which used for test materials analysis, structures of psychological conclusion.

The percentage of the psychologists needs in the development of counseling skills and techniques of psychological services are presented in Table 2.

**Table 2 – The percentage of the psychologists needs in the development of counseling skills and techniques of psychological services are presented**

| Counseling model for behavioral changes. (nutrition, physical activity, smoking) | 91.3% |
| Methods of psychological rehabilitation of patients after insult, heart attack | 78.2% |
| Model of counseling oncology patients | 73.9% |
| Methods of psychological treatment in the rehabilitation of patients after surgery | 65.2% |
| Counseling elderly patients | 65.2% |
| Art therapy techniques | 52.1% |
| Methods and techniques of relaxation | 52.1% |
Discussion

For data summarize, structuring and make recommendations was used SWOT-analysis, the results are presented in Table 3.

Table 3 – SWOT-analysis

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Psychological care and treatment, integrated with the main strategic</td>
<td>1. The qualifications requirements for professionals in the field of clinical</td>
</tr>
<tr>
<td>directions Kazakhstan health care development.</td>
<td>psychology contrary to international and domestic educational system in</td>
</tr>
<tr>
<td>2. The presence of bachelor in Psychology at all psychologists.</td>
<td>this specialty.</td>
</tr>
<tr>
<td>3. Skills in the use of psycho-diagnostic techniques.</td>
<td>2. Lack of opportunities for passing the certification to improve the</td>
</tr>
<tr>
<td>4. Active listening skills, and providing emotional support.</td>
<td>professional level.</td>
</tr>
<tr>
<td>5. High motivation of additional training and professional development.</td>
<td>3. Uncertainty functions and activity areas.</td>
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<td></td>
<td>4. Lack of educational programs tailored specifically to the work of</td>
</tr>
<tr>
<td></td>
<td>psychologists PHC.</td>
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<tr>
<td></td>
<td>5. Low awareness of physicians about the psychologists direction and</td>
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<tr>
<td></td>
<td>methods of work.</td>
</tr>
<tr>
<td></td>
<td>2. The development and strengthening of a comprehensive, multidisciplinary</td>
</tr>
<tr>
<td></td>
<td>approach to social-oriented primary care.</td>
</tr>
<tr>
<td></td>
<td>2. Expanding preventive orientation in the psychologists practice.</td>
</tr>
<tr>
<td></td>
<td>3. Prevention and screening for mental disorders and suicide risk.</td>
</tr>
<tr>
<td></td>
<td>4. The development of psychological rehabilitation for patients with</td>
</tr>
<tr>
<td></td>
<td>physical illnesses.</td>
</tr>
<tr>
<td></td>
<td>1. The lack of specialists in the field of clinical psychology and health</td>
</tr>
<tr>
<td></td>
<td>psychology.</td>
</tr>
<tr>
<td></td>
<td>2. Reduced the effectiveness of prevention programs.</td>
</tr>
<tr>
<td></td>
<td>3. Reduced the effectiveness of rehabilitation programs.</td>
</tr>
<tr>
<td></td>
<td>4. The poor quality of services in the field of mental health.</td>
</tr>
</tbody>
</table>

Opportunities

1. Training was implemented the Department of Public Health and Social Sciences, Kazakh School of Public Health. At the moment research team analyzing the feedback and evaluation of training.

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ON THE STATE AND PERSPECTIVES OF GERONTOLOGY SERVICE OF ALMATY

Key words: gerontology service, elderly and old people, long-livers, preventive care.

Abstract. There is a trend for quick population aging in the world. Population aging and global changes in lifestyle together place chronic and non-infectious diseases (including
depression, diabetes, cardio-vascular diseases (CVD) and cancer), as well as trauma, among the main causes of morbidity and mortality. The Republic of Kazakhstan (RK) is also part of the aging countries in the world. In the age structure of RK population as of 1 January 2007 the number of people over 65 years was 1 194,0 tsd. People or 7.85 % of the total number of population and it is growing every year. Currently in the RK there are about 7925957 of men and 8516002 of women. Among them about quarter is men (24 %) and 29.6 % women of old and elderly age (OEA). Average life expectancy in the RK in the last years is: in 2011 – 68, 41 years (men – 63,51 years, women – 73,32 years); in 2012 – 69 years (men – 63,6 years, women – 74 years); in 2013 it is reaching 70 years (men – 64 years, women – 73 years). Till 2018 the life expectancy is planned to reach 70 years, till 2024 – up to 80 years. This means increase of population that needs due to their health condition active multi-aspect support from the society and therefore readiness of the state to achieve this challenge. In Almaty gerontology offices are opened in clinics № 1, № 8, № 17, № 5, «Clinic of the World war 2 veterans (Veterans clinic)». In other clinics responsibility for gerontology patients’ treatment are placed at the general practitioners or heads of the general care departments. The data from each treatment organization on the veterans, long-livers, single, elderly and immovable patients are analyzed in the Veterans clinic, where gerontologists work, overseeing each area. Gerontologists of the Veterans clinic do consults and provide organizational and methodological care to gerontologists of other areas on the issues of gerontology care to relevant people. Health improvement of the gerontology age people is done out-patient, in day care, at home or in hospices, nursing homes and in other relevant in-patient care clinics of the city: City clinical hospital (CCH) № 1, CCH № 7, Central city clinical hospital (CCCH), CCH № 5, as well as within the quotas limits in scientific-research institutions: cardiology, surgery in the branch of the Republican veterans hospital. Growth of elderly patients has been recorded, long-livers with polymorbidity pathology and satisfactory work of the gerontology service. Service reforms are needed in the form of increasing prevention activities with implementation of modern management.

Introduction

There is a trend of quick aging of population in the whole world. To 2050 there will be more than 2 billion people over 60 years in the world, about 85 % of which will be leaving in the currently developing countries mostly in urban areas. In contrast with modern wealthy countries, countries with low or medium income level are aging quickly, not being able to get rich, which makes the problem more difficult.

Aging of population and global changes in life style together put chronic and non-infectious diseases (including depression, diabetes, cardio-vascular diseases (CVD) and cancer), as well as trauma, among the main causes of morbidity and mortality. There is a shift in mortality and morbidity causes distribution from younger towards older age from infectious, perinatal, and pregnancy related diseases to non-infectious diseases [1].

Aging brought attention to the issue of direct relevance for organization of services provision – increase of multi-system morbidity frequency. So far there is no full understanding of the fact that the problem of shift towards chronic diseases or adult health should take the lead compared to the programs devoted to prevention and treatment of infectious diseases, maternal and child health. It is impossible without bigger attention to solving the problem of unequal access to medicine, which is relevant for all countries with social inequality [2].

The Republic of Kazakhstan (RK) is also part of the demographically aging countries in the world. In the age structure of RK population as of 1 January 2007 the number of people over 65 years was 1 194,0 tsd. People or 7.85 % of the total number of population and it is growing every year. For comparison
as of the beginning of 2005 the aging threshold was 6.4 %, by 2030 according to the estimates there will be 11.5 % of elderly [3].

Currently in the RK there are about 7925957 of men and 8516002 of women. Among them about quarter is men (24 %) and 29.6 % women of old and elderly age (OEA) [4]. Average life expectancy in the RK in the last years is: in 2011 – 68, 41 years (men – 63,51 years, women – 73,32 years); in 2012 – 69 years (men – 63,6 years, women – 74 years); in 2013 it is reaching 70 years (men – 64 years, women – 73 years). Till 2018 the life expectancy is planned to reach 70 years, till 2024 – up to 80 years.

This means increase of population that needs due to their health condition active multi-aspect support from the society and therefore readiness of the state to achieve this challenge [5].

It should be noted that geriatric care system does not simply mean geriatrics services or provision of primary medical care to population above labor age in a general understanding. It is considered from different stand points:
- as a wide range of issues, related to health parameters and peculiarities of morbidity in elderly people;
- as a level of care provision that is based on a well organized system of geriatric training, diagnostic and treatment services, methodological and informational support;
- as an organizational model of multi-agency services provision style;
- as strategy of re-orienting health care and social protection system to targeted differentiated efficient care provision in the end of the life with use of best international practices;
- as a moral norm of social relations: gratitude of younger generation to the parents and support of the weak, developing qualities of respect and care for elderly people among children, development of volunteer movements among youth;
- as joining the efforts of state and non-government (community, religious, funds etc.) institutions;
- as a philosophical approach, based on the principles of social equality, confidence in positive development of state policy, economy and medicine [6].

Gerontology and geriatrics issues have not been duly developed in our healthcare system. It is even more relevant then to point out the significance of gerontological plan development. The so-called gerontological plan is basically a program document that presents main directions of state policy with regards to elderly people, creation of favorable conditions for their development and use of rights, assisting in their active participation in all spheres of social life. Strategic plans of the republic do not provide for development of gerontological plan, which, in our opinion, is a significant oversight in the process of socially oriented state building, one of the priority of which are elderly people.

With the absence of a separate gerontological plan in the RK, however, the government develops and implements separate sectoral programs in certain spheres of state policy. So, some issues of social protection provision and creation of generally favorable conditions for use of rights by elderly people is touched upon in such program documents, as: Concept of social protection of population, adopted by the Act of the Government of the Republic of Kazakhstan of 27.06.2001 № 886; State program for healthcare reform and development in the Republic of Kazakhstan for 2005-2010, adopted by the Decree of the President of the Republic of Kazakhstan of 13.10.2004 № 1050; Program of further enhancement of social reforms in the Republic of Kazakhstan for 2005-2007 adopted by the Act of the Government of the Republic of Kazakhstan of 30.11.2004 № 1241; Disabled people rehabilitation program for 2006-2008, adopted by the Act of the Government of the Republic of Kazakhstan of 06.01.2006 № 17; article 42, chapters 10 and 11 of the Code of the Republic of Kazakhstan «On population

Based on the analysis of these programs, it becomes obvious, that some system problems were not covered, that impede full-scale implementation of elderly people’s rights, namely: lack of gerontological sensitivity in republic’s legislation, weak social services development, coverage with social workers, gerontology and geriatrics specialists, weak research base for studies on aging problems, weak socialization etc. Therefore, considering volume and multi-dimension nature of these issues, their solution is rather difficult without comprehensive systemic approach and development of gerontological plan in the republic (National action plan for aging problems). However, there is effect of the same principles and approaches seen as earlier with sectoral division in the part of strategic development planning. Currently our republic is entering the new stage of development and implementation of comprehensive strategic programs will follow. Analysis of gerontological planning system enables to talk about lack of due attention to this issue on the part of government bodies responsible for policy implementation in this area, underestimation of the upcoming demographic changes among population of the country is in place. Single activities to bring attention to this issue do not have the necessary effect for solving the problems in this area.

This all defines the scope of most important issues that need to be solved, namely:

absence of gerontological plan of the main activities in state policy aimed at elderly people, lack of research in geriatrics, as well as lack of trained specialists in this area [7,8].

Aim and objectives: analysis and assessment of gerontology service work that is targeted on the needs of elderly population.

Materials and methods: mass analysis of statistical visit charts of the elderly population in Almaty.

Results


Gerontology offices have been created in the following city clinics: № 1, № 8, № 17, № 5, «Veterans clinic». In other clinics responsibility for gerontology patients’ treatment are placed at the general practitioners or heads of the general care departments. The data from each treatment organization on the veterans, long-livers, single, elderly and immovable patients are analyzed in the Veterans clinic, where gerontologists work, overseeing each area. Gerontologists of the Veterans clinic do consults and provide organizational and methodological care to gerontologists of other areas on the issues of gerontology care to relevant people.

Health improvement of the gerontology age people is done out-patient, in day care, at home or in hospices, nursing homes and in other relevant in-patient care clinics of the city: City clinical hospital (CCH) № 1, CCH № 7, Central city clinical hospital (CCCH), CCH № 5, as well as within the quotas limits in scientific-research institutions: cardiology, surgery in the branch of the Republican veterans hospital. For 6 months of 2013 there were 5128 people treated, from those in need- 5910 people, which was 90 % (2012 –5123 people treated, from those in need -5640 -99.7%).
In the day care hospitals 7145 individuals have received medical care, which comprised 100% of the people in need – 7145 people. (2012 – 7123-100% of the people in need – 7123). Number of who received care at home increased: 10800-100% (similarly in 2012 – 10240-100%) with cardio-vascular diseases, chronic lung and locomotor system diseases. In nursing homes 360 people were treated (2012 – 467 people), also an increase was seen pf people treated in the given healthcare organization.

On an annual basis 4651 single and elderly people are covered with preventive medical examinations, including full examination 4200 people, partial – 451 people (similarly in 2012 – 4230, including full examination 2845 people, partial – 1385 people.). After comprehensive medical examination the gerontologists identify medical and social problems of the patients and help with their solution.

Non-transportable patients are monitored by medical workers at home, annually a team of physicians: general physician, surgeon, neurologist, and ophthalmologist see the patients and take clinical tests: complete blood count (CBC), common urine analysis (CUA), mucus analysis, ECG.

8651 people are covered with chest x-ray, in 2012 – 8610 people.

Diagnostic tests for all retired people are done free of charge. 40% (in 2012 – 41 %) of non-transportable people are covered by mucus analysis for BK. There are 2 neglected cases of TB registered in 2012.

There are 20310 elderly people in Almaty subject to regular medical check-ups (in 2012 – 20266 people). In the nosology structure leading places are taken by circulatory system diseases – 9512 people (46,9 %), then respiratory diseases – 2610 (12,8%), gastrointestinal tract (GIT) diseases – 2514 (12,4%). Maximal growth rates were registered for neoplasms – 410 patients (2%), diseases of endocrine - 2405 patients (11,8%) and nervous system - 1348 (6,4%). At the same time respiratory system diseases, traumas and circulatory system with the most growth were dominating among prinary morbidity. 1511 people suffered from other diseases, which comprised 7%.

There were 31420 visits done by clinic’s physicians to single, elderly, non-transportable people at home on their requests and 37230 active visits. In 2012 – there were 31561 calls and 37852 active visits respectively. All single elderly people are covered by care from social workers of the territorial centers of social protection in city districts. Social workers monitor 218 single and elderly people (in 2012 – 221 people).

Such complex rehabilitation factor as health resort treatment is actively used for retired people. Annually such treatment is received in JSC «Resort Kazakhstan», «Ardager», «Ak-kayin». In the analysed period of 6 months 823 patients have received treatment, total cost comprising over 16 460 000 teng 2012 – 884 people with cost over 17 680 000 teng.).

According to the list of medications approved by the Order of the Ministry of healthcare of the RK (MH RK) elderly people get according to indications free medications – 14230 patients worth - 47 712 000 tenge. In 2012 г. 14033 patients have received medications worth 33 640 506 tenge.

Number of deaths among single and elderly people for the first 6-months of 2013 – 945 people, in 2012 - 947 people, respectively. There is a slight decrease of deaths noticed.

Among the mortality causes the first place is taken by cardio-vascular diseases – 496 people (52,3%). In 2012 it were 502 people (53,6%). Second place is taken by oncological diseases – 114-12,0 % (2012 – 164-8,6%). Third place is taken by other diseases –103-10,8 % (2012г. -134 people).

Discussion

Treatment and prophylaxis organizations of the city do all necessary activities to provide timely medical care for people of geriatric age, improvement of quality of life and increasing life expectancy of this group. Gerontology service of the city do scheduled work for dynamic medical service for war and labor veteran’s and other representatives
of the group. However the share of gerontology morbidity is growing in parallel with increase of elderly people. The true morbidity cannot be reflected in this study, because the results are assessed on the basis of utilization of medical services.

Conclusions

Gerontology service requires reforms in the form of enhancing preventive services with active implementation of modern management in gerontological care organization. This will lead to further development of socially oriented model of primary medical care.

The reasons for social inequality lie in social conditions that do not directly depend on the healthcare system. These root causes can be eliminated by means of cross-sectoral actions and intergovernmental activity. Furthermore, healthcare sector can take significant measures to achieve equality on the healthcare level. The basis for this is a reform portfolio, aimed at achieving total coverage, i.e. universal access to healthcare services while ensuring social protection of people’s health.

Recommendations:

1. Taking into account progressing aging of population in the RK in order to satisfy in the future different needs of elderly people, including provision of high quality medical care, it is necessary to develop regulatory documents, approved by the MH RK for development of gerontological services in RK and in Almaty in particular.

2. In the physicians’ development institutes there should be courses included on the issues of geriatrics to improve skills of general physicians, gerontologists not only in the RK, but abroad as well.

3. Organize in each territorial clinic in the RK, including Almaty gerontology offices for provision of specialized medical care to people of gerontology and geriatrics age group.

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MONITORING OF ACTION PLAN IMPLEMENTATION FOR ORGANIZATION OF INTERNATIONAL CONFERENCE, DEVOTED TO 35TH ANNIVERSARY OF ALMATY DECLARATION ON PRIMARY MEDICAL CARE

Key words: WWII clinic, primary care, preventive treatment, the survey population.

Abstract. The article analyses preparation to organization of an International conference devoted to the 35th anniversary of the Almaty declaration on primary medical care (PMC) in Almaty. The declaration was a result of World health organization (WHO) conference on PMC. Since adoption of Declaration increase in the role of PMC has been considered as an important part for improvement of population’s health and welfare, as well as creation of a more equitable society. PMC is the first link in the healthcare system, where people come with their problems, and where majority of population’s needs for medical care are satisfied. Taking into account key characteristics of PMC, it has always been a part of strategic healthcare development program. It is one of the main strategies in implementation of new European healthcare policy «Health 2020» and achievement of the UN Millennium development goals. Principles of Almaty declaration on PMC stay in the center of discussions for action program post-2015, which concentrate on several approaches and priorities, such as sustainability for all, maximum increase of healthy life expectancy, accelerating the progress on action program for health indicators, provided in the Millennium development goals, in particular, the problem of non-infectious diseases burden and universal access to healthcare has not been solved. On the service territory of the Veterans clinic there are 152 organizations with 20292 workers. Currently the amount of population served is 33949 people, including 22126 women, 11823 war veterans or people with equal status. There is a data base created in the clinic for registered population, patients register for endocrine, obstetrics-gynecology and pediatrics services. The clinic has implemented diagnostic and treatment protocols. Day hospital unit provided medical care to 7145 individuals. 10800-100% (same in 2012 – 10240-100%) people with CVD, chronic respiratory, locomotor system diseases have received care at home. There is an increase seen in patients, receiving care at home. In order to decrease prevalence of socially significant diseases annually comprehensive medical check-ups cover 4651 single and elderly citizens. Placement of thesis «On gerontology service» in communication platform G-Global and participation with presentation in a virtual exhibition «Healthcare: present and future» on 6-7 November 2013 had special significance. Monitoring was conducted for implementation of the Veterans clinic action plan. The preparation for the conference brings the results: all planned activities are gradually done, the clinics takes active part in virtual activities.

Introduction

The conference is held in close cooperation with the European bureau of the World health organization (WHO) and United Nations Children’s Fund (UNICEF) and is devoted to 35th anniversary of Almaty declaration. This declaration of 1978 is called «Health for all by 2000». The declaration was a result of WHO conference on PMC. It says that PMC is the main function and center of the healthcare system in any country
and is the first level of contact of a person, family and society with national healthcare system, providing the closest location of healthcare to the places of work and residence» [1].

Since Almaty declaration of WHO/UNICEF was adopted in 1978 enhancing the role of PMC has been considered as the most important part in improvement of health and welfare of population, as well as creating a more equitable society.

PMC is the first link in the healthcare system, where people come with their problems, and where majority of population’s needs for medical care are satisfied. Majority of PMC definitions agree on the following:

- PMC emphasizes not only treatment, but prevention of diseases and raising medical awareness of a patient.
- PMC quickly reacts on the needs of population and is supported by it.
- PMC is targeted on a patient and is providing continued medical care. By this term a situation is meant, when a patient and sometimes patient’s family turn to one physician, who gradually learns their medical and social status and wins their trust, thanks to which patients are more compliant with physician’s instructions [1,2].

Taking into account main features of PMC, it has always been a part of strategic healthcare development program. It is one of the main strategies in implementation of new European healthcare policy «Health 2020» and achievement of the UN Millennium development goals. Furthermore PMC is part of the WHO program to achieve universal healthcare coverage and initiative of the Secretariat general «Each woman, each child: from promises to actions».

Principles of Almaty declaration on PMC stay in the center of global discussions for action program post-2015, which concentrate on several approaches and priorities, such as sustainability for all, maximum increase of healthy life expectancy, accelerating the progress on action program for health indicators, provided in the Millennium development goals, in particular, the problem of non-infectious diseases burden and universal access to healthcare has not been solved [3].

For successful achievement of the goals the program of PMC should include the following components:

- increase of the population awareness about widely spread pathologies and their prevention methods;
- assistance to adequate supply with food and promotion of good nutrition;
- ensuring safety of water and improvement of sanitary conditions;
- protection of maternal and child health, including family planning;
- immunization against main infectious diseases;
- control over local endemic diseases and their prevention;
- sufficient treatment of widely spread diseases and traumas;
- provision of the basic medications.

PMC as a medical component of this program should be related to the society and should reflect its needs.

In order to achieve necessary intersectoral cooperation and comprehensive PMC time has come to reconsider the existing uniqueness of PMC, in order to assist countries in the development of strategies for PMC rationalization in response to changes [4].

Due to these reasons International conference is held, devoted to 35th anniversary of the Almaty declaration on PMC on 6-7 November 2013 in Almaty, Kazakhstan.

Aim and objectives: analysis of preparation in MSE with REA «Veterans clinic» to organization of International conference devoted to the 35th anniversary of Almaty declaration on PMC.

Materials and methods

Monitoring of implementation of action plan on preparation for the conference was done in «Veterans clinic».

MSE «City clinic of the veterans» is located in a typical building at Amangeldy street 41 (picture 1).
The clinic has capacity for 500 visits, in 2013 in 6 months of 2013 there were 39539 people served, including 21000 women and 13349 war and labor veterans, and individuals with equal status. Number of visits to clinic in 2012 was 10107 people.

Veterans clinic has license № 13010809 of 05.07.2013 for provision of medical care in 20 specializations.

On the service territory of the Veterans clinic there are 152 organizations with 20292 workers. Currently the amount of population served is 33949 people, including 22126 women, 11823 war veterans or people with equal status (picture 2).

There is a data base created in the clinic for registered population, patients register for endocrine, obstetrics-gynecology and pediatrics services. The clinic has implemented diagnostic and treatment protocols.

On 4 May 2011 new day hospital facility was opened with capacity of 30 beds. It is equipped with comfortable furniture, home appliances, treatment and physiotherapy equipment. Day hospital provides treatment including full complex of rehabilitation and health improvement activities, medication therapy, physiotherapy procedures, therapeutic exercise and massage. 7145 people have received treatment in day hospital, which comprised 100% of those 7145 people in need (in 2012 – 7123-100% of people in need). There is a decrease seen in number of treated patients because the amount of treatment at home has increased.
10800-100% have received treatment at home (the same in 2012 – 10240-100%), these were patients with cardio-vascular diseases, chronic respiratory, locomotor system diseases. There is an increase seen in patients, receiving care at home.

25 million Tenge has been allocated from the budget for medications provision for patients with diabetes, including 2 million Tenge for self-control tools (1 blood glucose monitor and test stripes).

Work is done to decrease prevalence of socially significant diseases. Annually comprehensive medical check-ups cover 4651 single and elderly citizens, including full checks 4200 people, partial – 451 people (same in 2012 – 4230, including full checks 2845 people, partial – 1385 people).

There is information available to the patients on guaranteed amount of free medical care in state and Russian languages. Preventive work is done in the form of periodic medical examinations with consequent dynamic monitoring and health improvement, visual promotion information, lectures, discussions, open house days, which are held in April October each year on the issues of increasing joint responsibility of population for health protection, observance of the healthy life style.

Obstetrics-gynecology service is working in the clinic, where there is clear continuity in work of all clinical departments. For the last 3 years there were not severe cases of late gestational toxicosis (such as, eclampsia) with decrease of their number, and level of perinatal mortality. Congenital syphilis was not registered as well. Prevention and treatment of iron and iodide deficiency of pregnant women is done.

Preventive examinations of the screening age population are done in the clinic; identification of the following: circulatory system diseases, oncological cases of: stomach, prostate, breast, cervix; viral hepatitis B and C.

**Results**

Prior to the conference, devoted to the 35th anniversary of Almaty declaration on
PMC an action plan was developed, including:

1. Conducting departmental meetings, devoted to 35th anniversary of Almaty declaration.
2. Organizing gerontological seminar, devoted to 35th anniversary of Almaty declaration.
3. Organizing Open house day for elderly population of Almaly district of Almaty with participation of narrow-field specialists.
4. Publications in mass media to the International day of the elderly.
5. Event devoted to the Day of disabled people as a result of the WWII (Preventive medical check-ups at home with participation of narrow-field specialists, dental examinations, blood tests, if indicated – rehabilitation in day hospital or at home).

All items on the action plan have been implemented, placement of thesis «On gerontology service» in communication platform G-Global and participation with presentation in a virtual exhibition «Healthcare: present and future» on 6-7 November 2013 had special significance.

Discussion

Preparation of the MSE with REA «Veterans clinic» to organization of International conference, devoted to the 35th anniversary of the Almaty declaration on PMC is done on the necessary level. This treatment and prevention organization is in line with other medical organizations of the city. The thesis published at G-Global communication platform raised interest, in short period of time this publication was seen about 40 times, there are 8 comments. The thesis was presented in 3 languages in virtual exhibition, which also proves a breakthrough not only in technological, but also intellectual perspective.

Conclusions

Organization of such conferences has given incentives for the work of «Veterans clinic» to enhance their main quality indicators and had general positive effect on moral and professional environment of the organization staff. This will all lead to further development of socially oriented model of PMC, gerontology service in particular, the interests of which lobbies the «Veterans clinic».

Qualified staff assists in enhancing quality of life of elderly patients, provides constant support to them, and provides continuous preventive care. This allows to decrease risk of conditions that require intervention, the frequency of which is growing every year due to lack of gerontology specialists.

Significant changes in age structure of Almaty population with it getting older have significant impact on the community and require large-scale and comprehensive measures [5].

Comprehensive protection of elderly people should become of the priorities in state policy. Elderly people need to have optimal conditions for health protection, availability of all forms of social and medical care [6,7]. All these issues are under constant monitoring of clinic specialists and the team takes efforts to solve them.

References

COMPETENT EXECUTION OF THE DISCHARGE DOCUMENT FROM A HOSPITAL BY PHYSICIANS FOR COMMISSION OF REGIONAL PUBLIC HEALTH DEPARTMENT’S CONSIDERATION AND RECEIVING TERTIARY CARE AT THE LEADING CLINICS OF THE REPUBLIC OF KAZAKHSTAN

Key words: Portal of the hospitalization bureau, planned hospitalization, population, quality of discharge document, measure of a medical specialist’s level.

Abstract. Currently, the region has an operating system of planned hospitalization in hospitals at all levels, through the Portal of the hospitalization bureau considering the patient’s right to free choice of doctors and medical organization with the possibility to get a guaranteed amount of free medical care, specialized as well as tertiary medical care (according to existing orders, number 166 dated March 31, № 492 dated July 3, 2010, № 983 dated December 20, 2010).

After the study of many different forms and content of discharge documents submitted for commission of regional public health department’s consideration, that do not reflect the true nature of the case, it was necessary to develop a single sample discharge document for maximal optimization of work of all stakeholders, starting from the head of the medical institution, a medical specialist, patient, to technical operator, who sends out the discharge documents to the commission.

Introduction

To assess health of a patient and the need to provide tertiary care in leading clinics of the Republic of Kazakhstan, maximally full qualitative data in the form of discharge document is needed, it should also meet all the requirements of the Portal of tertiary care, to provide timely and modern medical care.

Goal

To improve health-care organizations’ activities on submitting discharge document notes for consideration by the commission of the regional health care department, in order to further optimize and simplify work of the commission on the Portal of tertiary care of the regional health care department, I, responsible for Portal of the
Hospitalization Bureau of tertiary care of the regional health care department of Almaty region Kulchikova K.A., developed a single sample discharge document note presented in the following table. (attached)

<table>
<thead>
<tr>
<th>№</th>
<th>Name of medical institution which send the patient</th>
<th>&quot;State-owned public enterprise on the right of economic jurisdiction of Aksu district&quot;, Almaty region Tel.: 8(72832) 2-29-64</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of head of the institution</td>
<td>Zhumageldin Ashimgali Kussainovich</td>
</tr>
<tr>
<td>2</td>
<td>Name of the doctor who sent patient</td>
<td>Person in charge for the Portal of Hospitalization Bureau Head of clinic Baulybaev Targyn Tel.: 8(72832) 2-26-71</td>
</tr>
<tr>
<td>3</td>
<td>Name of Research institute</td>
<td>&quot;The National Surgery Research Center named after A.N. Syzganov&quot; Almaty</td>
</tr>
<tr>
<td>4</td>
<td>Research institute’s bed profile</td>
<td>Adult Cardiac Surgery</td>
</tr>
<tr>
<td>5</td>
<td>The purpose of hospitalization</td>
<td>Operative therapy</td>
</tr>
<tr>
<td>6</td>
<td>Name of the patient</td>
<td>Ongarova Saule IIN 111111111111</td>
</tr>
<tr>
<td>7</td>
<td>Date of birth</td>
<td>11.07.1958</td>
</tr>
<tr>
<td>10</td>
<td>ICD-10 CODE</td>
<td>Q 25.0</td>
</tr>
<tr>
<td>11</td>
<td>Conclusion decision of the Research Institute</td>
<td>Had an advisory with cardio surgeon Mr. Khakimov S.K. of the National Surgery Research Center named after A.N. Syzganov Dated 17.06.2013. DS: Congenital heart defects. Mitral and Aortic insufficiency, regurgitation of 1-2 type, tricuspid valve, chronic cardiac insufficiency-2A, function class-3, 2nd degree hyperpiesia. Function class-3, 2nd degree circular deficiency Approved on 12.07.2013</td>
</tr>
<tr>
<td>12</td>
<td>Brief anamnesis</td>
<td>Is sick since childhood ad is subject to regular medical check-up DS: Stenosis and mitral insufficiency. Aortic valve insufficiency. First stage cardiac insufficiency. Function class 2, cerebrovascular disease. 2nd degree hyperpiesia. Was on an outpatient and hospital treatment in regional cardiology center. Surgical treatment quota on the tertiary care Portal was recommended.</td>
</tr>
<tr>
<td>13</td>
<td>Clinical analyzes</td>
<td>FBC dated 01.07.2013 – Hemoglobin(HgB) - 131g/dl endoplasmic reticulum – 4,84. White blood cells – 5,4. blood-sedimentation test – 27 mm/hr dated 14.01.2013</td>
</tr>
<tr>
<td></td>
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<tr>
<td>---</td>
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</tr>
<tr>
<td>14</td>
<td>Biochemical analysis</td>
<td>dated 01.07.2013 bilirubin – 11.8 mg/dL total protein – 81.5, urea 10.7  mg/dL creatinine -13.2 mg/dL ALT – 0.04, AST – 0.035. Sugar-4.2 mg/dL</td>
</tr>
<tr>
<td>15</td>
<td>Results of photoentgenography</td>
<td>Lungs  plan radiography  dated 10.06.2013, conclusion of the phthisiologist – salutary</td>
</tr>
<tr>
<td>16</td>
<td>Echocardiogram</td>
<td>Mitral and Aortic valve insufficiency,  regurgitation of 1-2 type, tricuspid valve, HA2. Diastolic dysfunction of LV and RV of a relaxation dysfunction type.</td>
</tr>
<tr>
<td>17</td>
<td>ECG</td>
<td>Regular sinus rhythm with a heart rate 67 beats/min. Left axis deviation. Incomplete right bundle branch block. Changes in T anteroseptal leads.</td>
</tr>
<tr>
<td>18</td>
<td>Blood microreaction</td>
<td>01.07.2013 negative</td>
</tr>
<tr>
<td>19</td>
<td>stool ova &amp; parasites test</td>
<td>negative (28.06.2013)</td>
</tr>
<tr>
<td>20</td>
<td>HIV/AIDS results</td>
<td>negative (27.06.2013)</td>
</tr>
<tr>
<td>21</td>
<td>Hepatitis markers</td>
<td>negative (29.06.2013)</td>
</tr>
<tr>
<td>22</td>
<td>Coagulogram</td>
<td>(dated 29.06.2013) Activated partial thromboplastin time 35s, thrombin time – .11s, prothrombin time - 16.1 sec, INR -0.89, time of Quick-115%, ethanol gelation test – negative, fibrinogen (on Clauss) -2.66/l, L – L factor – 27-90 %, XIIa factor-dependent fibrinolysis – 7 min. SFC – 5.0 g/l. Conclusion: Normal Coagulation</td>
</tr>
</tbody>
</table>

Attached sample of discharge document note can be used by all health care facilities of the Republic of Kazakhstan, as it meets all the requirements of presenting information to tertiary care portal, as well as to the portal of Hospitalization Bureau of healthcare organizations in general.

**Materials and methodology**

In 2011, the commission received 17,587 non-standard discharge document notes for tertiary care that do not reflect the true nature of the patient appointments for tertiary care in the Republican Hospitals, 6657 of which applied to tertiary care portal, 5547 were hospitalized, 1110 were removed from the waiting list., for various reasons . Of 17 587 applications, i.e. applications to receive tertiary care by health-care organizations -10,930 appoints were incorrect, including wrong or false ICD-10 code, 5700 were not consistent with the diagnosis of the patient, 2310 were inappropriate, that is, those with medical conditions that require specialized medical care in various regional health care facilities non-compliant with the list of tertiary care centers, 150 were not citizens of the Republic of Kazakhstan, in 2770 cases appropriate amount of examinations was not conducted and so on.

Meetings on all relevant issues concerning the Portal of Hospitalization Bureau, including tertiary care, training seminars, appointing responsible medical specialists, deputy chief physicians in charge of the control and quality of the Portal of Hospitalization Bureau were held.

**Results**

After the introduction of the above-mentioned sample and also after intensive training of personnel, managers, specialist doctors of health - care organizations in the Portal of Hospitalization Bureau for tertiary care, for the same period of 2012 5670 patients were hospitalized, 700 were removed
from the waiting list, what significantly reduced up-planned instances.

It is time to move from quantity to quality, since significant experience was gained, furthermore tertiary care portal - like a mirror reflects all the nuances of our work with the population.

First and foremost It would be desirable to put high-quaified doctors with broad clinical thinking, with experience in public health practice, as well as specially trained to work on the Portal instead of today's technical operators on the Portal.

It allows to manage and organize this much needed, hard work in the right direction, and the results will immediately reflected on the quality of our work.

I would also like to note that necessary working conditions for high-quality processing of incoming information and to solve all the extra questions in case of necessity were provided for the doctors and persons in charge for tertiary care Portal of the healthcare department working on the Portal of Hospitalization Bureau, In general, there is a positive shift in the field of health care facilities, nevertheless, questions such as continuity, prompt and quality issues of diagnosis, hospitalization, and the level of qualification of the doctors on at places, objective competent assessment of the patient's condition in correspondence with ICD-10 still remain open;

Summing up, I would like to appeal to everyone who stands at the guard of health of our people, that work with the Portal is not a responsibility of people in charge of it, but it is also a duty of every physician to know the Portal of hospitalization Bureau, competently submit applications for consideration, keeping a close contact with the patient as well as with the institution that takes the patient to treatment.

Portal of the hospitalization Bureau must be a green corridor for patients to access timely and quality health care, and that requires a competent, well-considered approach from the side of medical specialists, and the whole level of medical professionals of healthcare organization which sends patients for treatment.

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EXPERIENCE OF TREATING PATIENTS WITH POLYTRAUMATISM IN CITY CLINICAL HOSPITAL (CCH) №4

Key words: polytraumatism, traumatic disease, intensive therapy.

Abstract. The article describes theoretical aspects and experience of patients’ treatment with polytraumatism in the conditions of city clinical hospital №4 in Almaty. Treatment results depend on the timely and comprehensive nature of diagnostic and treatment activities.

Multisystem trauma is an injury by one or more mechanical traumatic agent in 2 to 6 anatom- ic parts of the body, one of which is always life-threatening and is assessed with score 4 in AIS scale (6). Polytraumatism is one of the three leading mortality causes among Kazakhstan's pop-
ulation. In the age group below 40 years, deaths from trauma take the 1st place. About a third of surviving patients end with disability, in half of them quality of life is decreased mainly due to the traumas of locomotor system as part of polytraumatism (4). The reasons for these complications are that polytraumas and multisystem traumas are the injuries as a result of car accidents, catatraumas (high-energy traumas), and the vast majority of these locomotor system injuries are difficult in nature. Treatment of such injuries requires non-conventional solutions, high qualification of orthopedic trauma surgeon and long intensive rehabilitation. There is also an influencing factor that 20% of locomotor system injuries are open and there is a risk of supplicative complications. Improvement of care in cases of polytrauma is one of the most relevant issues of modern traumatology. The leading causes of mortality among patients with polytrauma in hospital stage are shock, blood loss, multisystem organ failure and infectious complications (7,8).

Introduction

Earliest possible anti-shock therapy and injuries diagnostics simultaneously with stabilizations of the vital functions is a necessary condition in polytrauma treatment. Emergent surgeries should be done within the first hour after trauma, including (if there are no contraindications) stabilization of bone fragments predominantly with external fixation. Compliance with these principles is possible if patients with polytrauma are concentrated in specialized departments of large multi-profile hospitals. It is necessary to avoid massive casting, skeletal traction. Timely less traumatic stable fixation of broken bones in patients with difficult multisystem trauma does not need justification, because it decreases mobility of bone fragments, decreasing sensory input, providing anti-shock effect, increases patients mobility, eases the care, decreases the number of hypostatic complications, which ultimately increases good treatment outcomes.

Materials and research methods

In the CCH №4 since 2012 an algorithm for polytrauma patients care has been adopted. Generally accepted international standards lie in the basis of this algorithm.

The patient is emergently hospitalized to ICU bypassing the admissions department. Trauma team is activated by the nurse when the information is received from emergency care services or in cases of self-admission, a person in charge of trauma team activation, gathering necessary data records them in the activation form and if at least one of the severe trauma criterion is in place, notifies the responsible traumatologist. Criteria of severe trauma: impairment of consciousness < 12 points in GCS; respiratory rhythm < 30 times/min; BP < 89 mmHg; heart rate > 120 times/min; stridor; SpO2 < 89%. Within 5 minutes after activation the team members – responsible traumatologist, surgeon, anesthesiologist, radiologist, functional diagnostics department physician, anesthesiologist’s assistant, two nurses, two nurses’ aides arrive to the resuscitation ward, get ready for patient’s admission or in case of self-admission start working immediately in protective clothing. Head of the team is a responsible traumatologist according to the internal regulations.

Medical care provision:

1. Ensuring clear airway. (Removal of foreign bodies, blood etc., start on O2 through the mask 10-15 liters per minute, immobilize C-spine, if this has not been done during emergency care stage)
2. Respiration (Assessment of chest condition. Auscultation of heart and lungs).
4. Stop external bleeding with the help of pressure dressing.
5. Do tests— (CBC, CUA, blood biochemistry, coagulogram, blood alcohol test).
6. Neurological assessment (Glasgow coma scale assessment)

The team leader makes a decision on the necessity of examination and treatment level, as well as on the location of the further treatment after assessing the scale of inju-
ries. Vital functions are monitored (BP, heart rate, saturation, RR, ECG, general physician consult, after the examination urinary catheter is put, head, chest, pelvis, L-spine, and other injured segments, CT is done if necessary).

In the admissions department there is an emergency OR equipped with the operating table, modern equipment for anesthesia and monitoring, kits for osteosynthesis and sets of pin and rod equipment, electro-optical device, mobile ultrasound. It is possible to provide emergent surgical treatment in such OR to the patients with multisystem trauma of locomotor system, head injury, chest and abdominal injuries.

First of all surgery is done to repair the life-threatening damages. If the patient has fractures osteosynthesis is done urgently. The main requirements for osteosynthesis in treating the patient with polytrauma are: 1) secure immobilization of bone fragments; 2) minimal invasion; 3) low traumatism; 4) short surgical intervention.

Blocking intramedullary fixation (BIMF) fully complies with these requirements and is successfully used in femoral, lower leg and shoulder fractures. Additional advantages have been identified, namely: single-step good reposition, absence of need for staged surgeries, minimal risk of postoperative infection (6, 7, 9). Open, multiple fractures are fixed with modern external fixation devices until the patient is stable. After stabilization of hemodynamic and clinical-laboratory indicators, if local conditions are in place on day 2-7 fracture fixation is done with modern implants, blocking rodes, angle stable plates.

Significant decrease of lethality and postoperative complications was noticed after implementation of this algorithm. Only in 2012 242 patients with polytrauma were treated in the department of multi-system trauma of the CCH №4. As for the type of trauma 81 patients were victims of domestic trauma (33,5%), 161(66,5%) after the car accident. 49 patients died (20,2%). The main cause of mortality was severe head trauma in 38 cases (77,5%), severe multisystem trauma - 8 cases (22,5%). Average treatment time was 28,5 bed/days. Since November 2012 (since the polytrauma treatment protocol was introduced) 61 patients were treated in the CCH №4. Mortality was 16,8% (10 patients). Average treatment time was 24,3 bed-days.

Conclusions

It is necessary to actively implement modern polytrauma diagnostics and treatment methods in the clinical practice.

Implementation of the injuries protocols, modern locomotor system fractures fixation methods leads to decrease of treatment time, lesser complications and improvement of quality of life.

References


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ENDOPROSTHESIS REPLACEMENT IN THE PRESENCE OF DYSPLASTIC COXARTHROSIS

Key words: hip replacement, coxarthrosis, congenital hip dysplasia (CHD).

Abstract. Connective-tissue dysplasia (dysplastic syndrome) in orthopedics - is a genetic or congenital disorder of connective tissue. Presents in increased mobility (hypermotility) of abartrosis, combined with the weakness of the connective tissue. It should be noted that early detection of developmental dysplasia (hypoplasia of one or both hips) responds well to correction and treatment.

Introduction

Unstable hip is very common - from 5 to 20% of newborns, however there are some geographical peculiarities of incidences. [7] For example it is 8% in Kazakhstan [1], 2-3% - in Russia [2], 2% - in Germany [3], in the USA incidences are higher among white population rather than among Afro-Americans and it comprises 1-2% [4]. Among native Americans hip abarticulation is observed in 25-50 cases out of 1000. Congenital dislocated hip is very rare among South American Indians, among population of south-eastern Asia and Africa [7].

Congenital dislocated hip is more often (80% of cases) among girls, CHD (about one third of cases) is inherited genetically. Hip dysplasia is 10 times more likely to be detected among those born in pelvic presentation, more often firstborns. Dysplasia can also be caused by medical correction of pregnancy, pregnancy complicated by toxemia. Most affected is a left hip (60%), more rarely right (20%) or both (20%) [8].

Goal of the study

To review outcomes of the total hip replacement for the patients with dysplastic coxarthrosis at the endoprosthesis replacement unit of the city clinical hospital #4 of
Almaty during the period from 2012 to 2013, to determine the best approach in the surgical treatment of this pathology.

**Materials and methodology**

During the period from 2012 to 2013 2137 total hip replacement were executed in the endoprosthesis replacement unit of the city clinical hospital #4 of Almaty. 57 of them were conducted because of dysplasia. Dysplastic hip presents a wide range of changes in the anatomy of the acetabulum, proximal femur and in their relationships. Planning of treatment of dysplastic coxarthrosis and its success often depends on the severity of dysplasia, and the degree of dislocation. In this regard, it becomes necessary to classify the pathology to compare individual cases and for a competent presurgical planning, and hence to improve the outcomes of treatment. Complementary criteria for this classification are the accuracy (reliability) and ease of use (validity).

In search of universal classification many systems to assess the degree of dysplasia and dislocation of the hip were proposed. Thus, according to the standard International Classification of Diseases - ICD-10 (1989) three degrees of severity of the process were distinguished:

- 1st degree — subluxation (dysplasia);
- 2nd degree — semiluxation;
- 3rd degree — dislocation.

However, this classification is very superficial in its reflection of those anatomical changes, which are happening during the dysplastic coxarthrosis, because it is not orthopedic.

Eftekhar (1978) includes 4 stages of this condition:

- A - slightly elongated and beveled acetabulum with some deformity of the head;
- B - intermediate false acetabulum
- C - high false acetabulum
- D - high dislocation, no neo-acetabulum

Mendes et al. (1996) suggested a classification of congenital dysplasia of femur in adults for the total hip arthroplasty planning. For this purpose they determine following terms: subluxation and high dislocation. This classification includes following points: the adequacy of the bone of the acetabulum and its inclination; condition of the soft tissues, the presence of contractures, muscle weakness; deviation of the pelvis, lumbar spine contortion, difference in extremities length, gonycampsis.

Kerboul et al. (1987) offered the following scale: Front, rear and intermediate types of dysplasia. These classification is rarely found in the literature and there is no data to present evidence of their reliability. The acetabular angle described by Sharp, and the Wiberg's angle (1939) are also used to measure the degree of dysplasia. Radiographs taken in the anteroposterior projection, show the inclination degree of acetabular. Method has its value mainly in assessing minor dysplasia, when there are no severe deformation and displacement of the femoral head.

The most commonly used are classifications by Crowe [5] and Hartofilakidis (1988). For the method proposed by Crowe on radiographs of the pelvis in the anteroposterior projection it is necessary to measure the height of the pelvis (from the highest point of the iliac crest to the lower edge of the tuberosity of the ischium), to identify the place where femoral head and neck are connected and the shape of tear. Classification is based on raising the proximal migration of the femoral head and its percentage in relation to the height of the femoral head or pelvis. The author distinguishes four degrees, based on the distance from the bottom edge of the figure of tear till the place where femoral head and neck are connected from the medial side (which are almost on the same level by the norm). According to Crowe, the average height of the femoral head is 20% (1:5 ratio) from the height of the pelvis. Thus if we have 50% dislocation, it means that the head is displaced in a proximal direction from the reference line by a distance comprising 10% of the height of the pelvis [5,6].
Table 1 – Crowe’s classification

<table>
<thead>
<tr>
<th>Degree</th>
<th>Dislocation</th>
<th>% of the height of the pelvis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crowe I</td>
<td>Less than 50%</td>
<td>Less than 10%</td>
</tr>
<tr>
<td>Crowe II</td>
<td>From 50% to 75%</td>
<td>10-15%</td>
</tr>
<tr>
<td>Crowe III</td>
<td>From 75% to 100%</td>
<td>15-20%</td>
</tr>
<tr>
<td>Crowe IV</td>
<td>More than 100%</td>
<td>More than 20%</td>
</tr>
</tbody>
</table>

Picture 1 – Classification: I – 50%, II – 50-75%, III – 75-100%, IV – more than 100%

Table 2 – In 1988 Hartofilakidis et al. divided dysplasia and dislocation into 3 types

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Deficiencies of the acetabulum as verified during surgery</th>
</tr>
</thead>
</table>
| Dysplastic hip   | The femoral head is contained within the original acetabulum despite the degree of subluxation | Segmental deficiency of the superior wall  
Secondary shallowness due to fossa-covering osteophyte |
| Low dislocation  | The femoral head articulates with a false acetabulum that partially covers the true acetabulum to a varying degree | Complete absence of the superior wall  
Anterior and posterior segmental deficiency  
Narrow opening and inadequate depth of the true acetabulum |
| High dislocation | The femoral head is completely out of the true acetabulum and migrated superiorly and posteriorly to a varying degree | Segmental deficiency of the entire acetabulum with narrow opening.  
Inadequate depth  
Excessive anteversion  
Abnormal distribution of bone stock, mainly located superoposteriorly in relation to the true acetabulum |
Image 2. Hartofilakidis' classification:
A – dysplasia,
B – low dislocation,
C – high dislocation.

Yiannakopoulos et al., after reviewing 102 X-Ray pictures of CHD in adults, report about high validity and applicability of the Hartofilakidis's classification during pre-surgical planning what was confirmed by anatomical changes detected during the surgery [7].

Validity of Hartofilakidis and Crowe classification was studied by Decking et al. (2004). Study included X-Ray picture of 51 patients (62 athermalosis).

Image 3. a – X-Ray picture of CHD: type 1 according to Hartofilakidis;
b–the same picture with notes according to the Crowe's system: A – height of the pelvis, B – between distance from the figure of tear to place where femoral head and neck are connected, B/A<0,1 (less than 10% of height of the pelvis) – Crowe I.

Image 4. a – X-Ray picture of CHD: type 2 according to Hartofilakidis;
b–the same picture with notes according to the Crowe's system: A – height of the pelvis, B – between distance from the figure of tear to place where femoral head and neck are connected, 0,1<1,5 (10-15% of height of the pelvis) – Crowe II.

Image 5. a – X-Ray picture of CHD: type 2 according to Hartofilakidis;
b—the same picture with notes according to the Crowe's system: A – height of the pelvis, B – between distance from the figure of tear to place where femoral head and neck are connected, \( B/A > 0.2 \) (more than 20% of height of the pelvis) – Crowe IV.

According to the data of this study, both reviewed classifications by their validity more applicable rather than others, mentioned above, though X-Ray picture reviewing by this methods is connected with some challenges. Thus Crowe's method requires pelvis's X-Ray picture capturing its whole height, what is not fulfilled in many hospitals. Moreover, in extreme conditions identification of tear's figure and of exit points of femoral head into neck is impossible. In some cases differentiation of 2nd and 3rd types according to Hartofilakidis (contact between false and true acetabulum) was discutable [6]

It is possible to argue that both classifications (Crowe и Hartofilakidis) can be used equally because they are complementary. Hartofilakidis's classification is more focused on the status of acetabulum in different stages of dysplasia and hip dislocation, at the same time Crowe helps to visually understand degree of femoral head's migration (in particular in high dislocations). Except that, subluxation can be of the same degree even in different conditions of an acetabulum.

In other words for a more accurate diagnosis of dysplasia-coxarthrosis or of a high dislocation it is necessary to use both systems of dysplasia degree assessment, because they reflect different parts of one and the same pathologic process. That said, we tried to develop a working classification of dysplasia-coxarthrosis, which is based on the Hartofilakidis and Crowe systems.

This classification is represented by a scale, where value of the grade is in direct proportion to dysplasia-coxarthrosis intensity (from 0 to 10) and is a score reflecting degree of CHD and rate of migration of the proximal femur.

### Table 3

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Femoral head</td>
<td></td>
</tr>
<tr>
<td><strong>Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Norm</td>
<td>0</td>
</tr>
<tr>
<td>Femoral head is slightly dislocated (less than 50%)</td>
<td>1</td>
</tr>
<tr>
<td>Subluxation is more obvious (displacement of the femoral head from 50 to 75%)</td>
<td>2</td>
</tr>
<tr>
<td>displacement of the femoral head is 75-100%</td>
<td>3</td>
</tr>
<tr>
<td>displacement of the femoral head is more than 100%</td>
<td>4</td>
</tr>
<tr>
<td><strong>Acetabulum</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Norm</td>
<td>0</td>
</tr>
<tr>
<td>Shallowness of the true acetabulum is present (angle Sharp &gt;40 degrees), absence of false acetabulum</td>
<td>1</td>
</tr>
<tr>
<td>The femoral head articulates with a false acetabulum that partially (on a half or more) covers the true acetabulum</td>
<td>2</td>
</tr>
<tr>
<td>Layering of false acetabulum on true is still at place but less than 50%</td>
<td>3</td>
</tr>
<tr>
<td>complete isolation of true and false acetabulum</td>
<td>4</td>
</tr>
</tbody>
</table>
Consequently, total score - 8 corresponds to the complete dislocation of the hip – high-dislocation? True neoarthrosis. This condition conventionally assumes displacement of the femoral head to 4.5 sm (average height of the femoral head). Further alignment is as follows:

<table>
<thead>
<tr>
<th>Characteristics of proximal femur and acetabulum</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement of the femoral head on 4.5-6.5 cm There is a contact between femur and flank bone</td>
<td>9</td>
</tr>
<tr>
<td>More than 6.5 cm displacement of proximal femur keeping the contact with flank bone, and also absence of any contact with flank bone or complete anti-septic necrosis of femoral head</td>
<td>10</td>
</tr>
</tbody>
</table>

Thus, on the basis of analysis of existing classifications of dysplasia and congenital high hip dislocation an attempt to develop unified classification was undertaken, where scores distribution by the degree of severity of the process can be as follows:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0-1</td>
</tr>
<tr>
<td>II</td>
<td>2-4</td>
</tr>
<tr>
<td>III</td>
<td>5-7</td>
</tr>
<tr>
<td>IV</td>
<td>8-10</td>
</tr>
</tbody>
</table>

Initially - Harris Hip Score - pain disappeared, range of motion increased up to 97 - 100 points by Harris. The center of rotation restored, limb length becomes equal. Also the following complications are observed: of a phlogistic nature, dislocation of the endoprosthesis head. Patients are satisfied with the results of surgery for hip replacement. During prosthetic following technical difficulties occured: the high hip dislocation complicates diaplasis and fixation of cups into the true acetabulum.

Tracked results – 40 surgeries of Total Hip Arthroplasty (THA) in dysplastic coxarthrosis, representing 5 % of all cases of implantation of hip arthroplasty. Of these - 36 women (90 %), males - 4 (10 %). The average age of the patients was 53. Ambilateral damage was observed in 25 (62.5%) patients. Arthroplasty implantation was complicated not only due to the disorder of the anatomical relationship of dysplasia, but the fact that 23 (57.5 %) patients previously had surgeries: open reduction of dislocation of the femoral head, different methods of femoral osteotomy (valgus, varus), acetabular roof formation, myotomy, extra-articular surgery.

Indication for endoprosthesis were changes in the joint, corresponding to stages III and IV of disease according to Kelgren (1956) and stage II with severe pain syndrome, ino effect of non-surgical treatment.

For THA we used implants of the following companies:
- «De Puy» (USA) – in 10 (25 %) cases;
- «Stryker» (USA) – in 30 (75 %) cases;

Uncemented fixation cruz/press-fit cup (with screws). Uncemented implant was used in 30 (75%) surgeries, hybrid implant — in 10 (25%) cases (uncemented cups with screws, cement cruz).

Most commonly used technique was formation of the bed from the superior and posterior portions of the walls of the acetabulum and uncemented implantation of small size acetabular component (42-46) with the maximum possible preservation of bone. Defects of the upper edge of the acetabulum (undercovered cup up to 10-
15% ) were within the normal range and and were filled with bone chips.

Bone autoplasty of the femoral head in 12 surgeries was used in rear upper quadrant. In 10 cases of them reinforcing rings with a low-profile cemented cup of Burch-Schneider type were applied. In two cases (to strengthen the acetabular roof) cemented plastics with cement reinforced by two cancellous screws was used.

28 people have undergone limb shortening of 4-5 cm or more, where subtrochanteric shortening osteotomy was held (extirpated segment length from 2 to 5 cm).

During the surgery planning in these cases, we set two main objectives:
1. Lowering of the femoral head to the required level;
2. Recovering anatomical limb length.

**Outcomes**

Post-surgery complications:
1. Phlogistic complications were seen in 2 cases (5% of the total surveyed). In one patient, the effect was achieved by nonsurgical treatment with a positive result, and one patient had to remove the implants due to the development of deep infection in the prosthesis, and a year later, after the relief of the phlogistic process, revised arthroplasty has been conducted.
2. Dislocation of the femoral head occurred in 2 cases (5%) due to breakage of mechanical regime by the patients, dislocations occurred at a later time (4 to 6 months after surgery). These patients have undergone ineffective non-surgical emboles that caused the operative exploration of arthroplasty replacement of heads on a larger size (for increasing the amount of offset) and elimination of dislocations.

Depending on the degree of acetabular dysplasia and proximal femur part the type of prosthesis was chosen. One of the main problems with dysplasia is implantation of the acetabular component in primary acetabulum. In our opinion, only osteoplastic operations will produce high quality and long-term fixation of the acetabular component, and later, already with the full bone bed to do a re-prosthetics. Most often, we use femoral head itself for plastics. If it is missing, we use a transplant from the iliac wing.

Positive long-term functional results were observed in 90% of operated patients: no pain, significantly improved movement in the arthrosist. 82% of patients reported disappearance of the Trendelenburg phenomenon.

In one case, we were forced to remove the prosthesis without reimplantation, due to the worsening of chronic osteomyelitis, 1 patient still has neurological symptoms of neuritis of the sciatic nerve, in 4 cases endoprosthesis cruz had been replaced because of its aseptic loosening , 2 patients are not satisfied with the range of movements in prosthetic arthrosis, 1 patient still has defected mechanics of walking and severe pain in the hip. Thus, altered anatomical relationship with dysplastic coxarthrosis require a differentiated approach in the selection of the type of prosthesis and its implantation procedure in each individual case. In some cases, it is neccessary to do bone plastics of cranio-ateral or dorsal segments of primary acetabulum for quality fixation of the acetabular component.

**Conclusions**

1. Earlier surgeries significantly impede implantation of an artificial prosthesis and affect long-term results.
2. Endoprosthesis with dysplastic coxarthrosis is among the most complex and often problematic sections of orthopedics. Damage of normal anatomic relationships of both the hip and pelvis, spine, limbs, greatly complicates the planning of the surgery and its execution.
3. A lot of unusual situations that may arise during the operation on dysplastic coxarthrosis, increased number of risk of intraoperative complications require careful preparation for the surgeries, ability to predict all the different options, and
necessity to have additional design tools and materials.

4. Apply modern hip implants mainly of uncemented fixation, as well as additional structures in patients with dysplastic coxarthrosis that allows to get a good anatomical and clinical outcome for a long time.

References

1. B. Agaliyev head of the section of medical and social assessment № 1 of the department on control and social protection for West Kazakhstan Oblast according to the data of Ministry of Labor and Social Protection of Kazakhstan.


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EVALUATION OF THE SCHOOL CLOSURE EFFECTIVENESS DURING THE INFLUENZA AND ACUTE RESPIRATORY ILLNESS EPIDEMICS BASED ON THE SCHOOL HOLIDAY MODEL

Key words: influenza, epidemic, anti-epidemic activities.

Abstract. The question of practicability of school closure during the influenza epidemic is actively debated. However, an anti-epidemic effectiveness of this action has not been closely studied.

The purpose of this study was to determine an anti-epidemic effectiveness of school closure using school holidays as a model in a context of a large city. The study’s objective was to study the impact that school fall (1 week) and winter (2 week) holidays had on influenza and ARI morbidity rates over the last 13 seasons (2000 – 2013) in the city of Tashkent.

We used weekly data on the influenza and acute respiratory infections (ARI) morbidity rates collected during the routine surveillance in Tashkent for the 2000-2013 seasons. Intense incidence rate was calculated per 10 000 population for each age group. We studied average morbidity rates for influenza and other acute respiratory infections (ARI) registered during fall and winter holidays and during 2 weeks after holiday periods and compared those with 2-week peri-
Introduc
tion

During the 2009-2010 influenza pandemi
c period preparation as well as during the
pandemic itself, a question of effectiveness
of closure of schools and other educational
facilities was actively debated [1]. Apart
from the debates about anti-epidemic effec
tiveness of school closure, there were other
opinions with regards to definition of epide
mic criteria of introduction of this measu
re, period of time, during which schools
should remain closed, and a strategy with
regards to closure of certain or all schools in
the region, since in addition to the burden
related to the epidemiological situation it
self, closure of childcare facilities would
imply a number of social and economic
problems [2,3,4]. A justified strategy and
tactics of school closure during an epidemic
period has not been developed. A lot of fac
tors contributing to solution of this issue de
pend on an organization of the healthcare
and educational system in the country. Valid
justifications are needed to adopt a decision
to close educational and daycare facilities
even at the regional level, not to mention a
countrywide action. Therefore, evaluation of
practicability and effectiveness of closure of
educational and childcare facilities as an an
ti-epidemic measure during an influenza ep
demic is of a considerable interest.

The purpose of this study was to define
anti-epidemic effectiveness of school clo
sure using a school holiday model in the
context of a large city. The objective of the
study was to analyze an impact that school
fall (1 week) and winter (2 week) holidays
had on influenza and ARI morbidity levels
over the last 13 seasons (2000 – 2013) in
the city of Tashkent.

Materials and Methods

To conduct the study we used the data of
the routine epidemiological surveillance of
weekly influenza and other acute respiratory
infection (ARI) morbidity levels during the
last 13 seasons (2000 – 2013) in the city of
Tashkent. To define an age structure of the
morbidity, we analyzed an aggregate influ
enza and ARI morbidity within 4 age groups
(0-2, 3-6, 7-14 and 15 and older). Intense
incidence rate was calculated per 10 000
population for each age group. Annual fall
and winter holidays were used as a school
closure model. Fall holidays lasted for 7

Morbidity rates decreased among school children (7-14 years of age) by 14.5-27.2%
(p<0.01-0.001) during fall school holidays throughout 8 seasons. A 24.6 – 63.6% (p<0,001) de
crease was observed during winter holidays during 12 seasons.

Moreover, school holidays had an impact on a decrease of morbidity among younger children
and adults. For example, a 11.9-25.6% (p≤0.05-0.01) morbidity decrease was observed among
0-2 year old children during fall holidays during 5 seasons. Morbidity among 0-2 year old chil
dren was 15.8 – 38.7% lower during winter holidays and 13.1 – 44.3% (p<0,05-0,001) lower
during the post-holiday periods during 5 seasons. The 14.9 – 53.5% morbidity decrease among
3-6 year old children was observed during a holiday period during 7 seasons, while a 13.4 –
47.9% (p<0.01-0.001) morbidity decrease was observed during the post-holiday period during 4
seasons. Morbidity among adults was 10.5 – 61.6% (p≤0.05-0.001) lower during the holiday
period during 10 seasons and 10.2 – 39.4% (p<0.05-0.001) lower during the post-holiday period
during 5 seasons.

School holidays result in a decrease of the influenza and ARI morbidity rates among students
by 13.4 – 63.6% and among other age groups by 10.2 – 61.6%; therefore, closure of schools
during an influenza epidemic can be a rather effective anti-epidemic activity, which will lower a
burden for the healthcare system. Qualitative criteria of an objective evaluation of severity of an
epidemiological situation defining terms and periods, during which schools will remain closed,
ned to be developed.
days and since they did not always coincide with a calendar week, a 1-2 week period was covered. Winter holidays lasted longer and -14 days on average and covered the period of 2-3 weeks. A comparative analysis of the dynamics of average aggregate influenza and ARI morbidity rates within the 4 age groups during the holiday period (2) and 2 weeks of the post-holiday period (3) relative to a 2-week post-holiday period was conducted (1).

Significance levels of the differences in mean intense incidence rates were calculated using Student’s t-test. Confidence level was set at 95% (P ≤ 0.05). The differences in statistically significant morbidity rates was shown in extensive indicators (%).

Results

During the period of observations, school children (7-14 years of age) played a significant role in an influenza and ARI epidemic process ranking number three by the morbidity level after children in the 0-2 and 3-6 age groups (image 1). The share of 7-14 year old children among all sick individuals ranged between 17.5 and 23.7% in different years.

An almost every day exposure of large groups of school children (25-45 children) in relatively constrained conditions in a confined area of classrooms, explains a high epidemiological significance for school children.

School holidays can be considered a very convenient model of school and childcare facility closure as an anti-epidemic measure. Analysis of the morbidity over a number of years has demonstrated that fall holidays as a rule start during a relatively low epidemiological season (early November). Only once fall holidays coincided with the epidemic rise of morbidity in the fall of 2009 (the 2009-2010 influenza pandemic). Winter holidays, on the other hand, as a rule start at a time of an intensive rise of morbidity (late December). We did not look at significance of spring holidays because they take place at the end of a season (late March) with low influenza and ARI morbidity.

It was established that during the 13 seasons that we analyzed, a statistically significant (p<0.01-0.001) 14.5-35% reduction in influenza and ARI morbidity among 7-14 year old children during fall holidays was observed during 8 (61.5%) seasons (Table 1). During the post-holiday period, the morbidity rate remained 13.4 – 14.6% (p<0.05-0.001) lower than that in the pre-holiday period only during 2 seasons (15.4%). During other seasons, the post-holiday period morbidity level exceeded that of the pre-holiday period. During the 2009-2010 pandemics, fall holiday period morbidity went up by 56.9% and increased 323.4% more during the post-holiday period.

During winter holidays (table 2), a statistically significant (p<0.001) 24.6-63.6% decrease in the morbidity level among school children (7-14 years of age) was observed during most of the seasons – 12 season (92.3%). A statistically significant (p<0.001) 14.3-63.1% decrease of the morbidity level during the post-holiday period was observed during 8 out of 13 seasons (61.5%) compared to the pre-holiday season. A 3.7 – 158.8% morbidity increase in the post-holiday period compared to the pre-holiday period was observed only during 4 out of 13 seasons (30.8%).

We have also detected that an interruption in class attendance by school children during holiday periods had an impact on a decrease of the influenza and ARI morbidity among younger children and adults. For example, we noticed a significant (p<0.05 – 0.01) 11.9-25.6% reduction of the influenza and ARI morbidity level among 0-2 year old children during fall holidays during 5 out of 13 (38.5%) seasons and a 12.5% post-holiday period reduction during one season. A statistically significant (p<0.05) 14.3% and 11.2% reduction of morbidity was observed in 1 holiday and 1 post-holiday periods respectively.

A statistically significant (p<0.05-0.001) 15.8 – 38.7% reduction of morbidity among 0-2 year old children during the holiday period and a 13.1 – 44.3% reduction during the post-holiday period were observed during 5
(38.5%) seasons. Among 3-6 year old children, a statistically significant (p<0.01-0.001) 14.9 – 53.5% reduction of morbidity during the holiday period was observed during 7 (53.9%) seasons and a 13.4 – 47.9% reduction was observed during the post-holiday period during 4 (30.8%) seasons. We have also observed a statistically significant (p<0.05 – 0.001) 10.5-61.6% decrease in morbidity among adults during the holiday period during 10 (76.9%) season and a 10.2-39.4% decrease during the post-holiday period during 5 (38.5%) seasons by.

Discussion

A relatively low level of influenza and ARI morbidity was observed during fall holidays compared to winter holidays. In addition, a period of interruption of classes during fall holidays is relatively short (1 week). Therefore, winter holidays, which usually start during a high epidemic period and last longer than fall holidays (2 weeks) had a more significant impact on reduction of the morbidity rate. The impact of early and extended closure of schools on a decrease of the morbidity level has been observed by other researchers as well [2, 3, 4].

When school holidays coincided with a period of an active morbidity increase, in addition to a decrease of the morbidity level among school children we have also observed a decrease of morbidity among pre-school children and adults, which is an indirect evidence of an epidemiological significance of school children as active sources of infection during seasonal activation of the epidemiological process.

The decrease in the numbers of sick students over the holidays and post-holiday period reduced the sources of infection and therefore decreased the intensity of the epidemic process among pre-school children and adults, both in households and in the city.

However, the effectiveness of this activity cannot be observed in all cases. For example, during the 2009-2010 influenza pandemic an active morbidity increase started after fall holidays (late October) and finished before winter holidays (early November).

Due to social and economic problems [2] arising from such an anti-epidemic measure as closure of childcare facilities, it must be conditioned by risks of significant prevailing social and economic damages of an epidemic. With this regards, it is necessary to develop application criteria for closure of childcare facilities in case of unfavorable epidemiological conditions. At the same time it should be noted, however, that short-term closure of schools for less than 2 weeks will not ensure a sufficient anti-epidemic effectiveness of this measure. Closure of childcare facilities during an active increase in morbidity (with an at least 2 hold increase of the epidemic threshold) and prior to a decrease of the critical morbidity level would be most effective.

It would not be feasible to close only some childcare facilities (facilities with a high morbidity level) since this action will not limit the spread of an epidemic throughout the region.

When discussing social and economic problems in families of school children related to closure of schools [2,4], it should be noted that such problems do not usually arise on a mass scale during fall, winter and spring breaks, which cumulatively last for 4 weeks.
Morbidity per 10 000 people
Age groups: 0-2, 3-6, 7-14, 15 and older

**Table 1 – Influenza and ARI Morbidity Dynamics during Fall Holidays**

<table>
<thead>
<tr>
<th>Season</th>
<th>Indicators</th>
<th>Age groups</th>
<th>0-2 years of age</th>
<th>3-6 years of age</th>
<th>7-14 years of age</th>
<th>15 years of age and older</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2000-01</td>
<td>Int. ind.*</td>
<td>%</td>
<td>95.4±3.3</td>
<td>93.6±3.1</td>
<td>124.3±4.8</td>
<td>80.4±3.4</td>
</tr>
<tr>
<td>2001-02</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>92.0</td>
<td>129.0</td>
<td>100.0</td>
</tr>
<tr>
<td>2002-03</td>
<td></td>
<td>%</td>
<td>107.5±4.3</td>
<td>111.9±3.6</td>
<td>104.3±5.5</td>
<td>55.2±2.3</td>
</tr>
<tr>
<td>2003-04</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>103.4</td>
<td>96.5</td>
<td>100.0</td>
</tr>
<tr>
<td>2004-05</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>99.0</td>
<td>108.0</td>
<td>100.0</td>
</tr>
<tr>
<td>2005-06</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>82.6</td>
<td>87.5</td>
<td>100.0</td>
</tr>
<tr>
<td>2006-07</td>
<td></td>
<td>%</td>
<td>93.8±3.3</td>
<td>88.8±3.2</td>
<td>106.2±1.4</td>
<td>48.3±2.9</td>
</tr>
<tr>
<td>2007-08</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>91.4</td>
<td>107.3</td>
<td>100.0</td>
</tr>
<tr>
<td>2008-09</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>86.4</td>
<td>89.1</td>
<td>100.0</td>
</tr>
<tr>
<td>2009-10</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>74.4</td>
<td>98.1</td>
<td>100.0</td>
</tr>
<tr>
<td>2010-11</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>108.8</td>
<td>119.7</td>
<td>100.0</td>
</tr>
<tr>
<td>2011-12</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>85.9±3.1</td>
<td>87.6±3.1</td>
<td>38.0±1.8</td>
</tr>
<tr>
<td>2012-13</td>
<td></td>
<td>%</td>
<td>100.0</td>
<td>82.7</td>
<td>100.1</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Intensive indicator per 10 000 people in a given age group.
1 – pre-holiday period; 2- holiday period; 3 – post-holiday period.
Table 2 – Influenza and ARI Morbidity Dynamics during Winter Holidays

<table>
<thead>
<tr>
<th>Season</th>
<th>Indicators</th>
<th>Age groups</th>
<th>0.2 years of age</th>
<th>3.6 years of age</th>
<th>7.14 years of age</th>
<th>15 year of age and older</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2000-01</td>
<td>Int ind*</td>
<td>%</td>
<td>128±3.3±8</td>
<td>96±6±3.3</td>
<td>127±7±3.8</td>
<td>72±1±2.6</td>
</tr>
<tr>
<td>2001-02</td>
<td>Int ind</td>
<td>%</td>
<td>116±4±3.7</td>
<td>91±8±3.4</td>
<td>99±7±3.3</td>
<td>61±2±4.1</td>
</tr>
<tr>
<td>2002-03</td>
<td>Int ind</td>
<td>%</td>
<td>77±4±3.0</td>
<td>92±4±3.3</td>
<td>122±7±3.8</td>
<td>45±7±2.1</td>
</tr>
<tr>
<td>2003-04</td>
<td>Int ind</td>
<td>%</td>
<td>110±4±3.4</td>
<td>90±7±2.4</td>
<td>98±8±3.1</td>
<td>74±9±2.1</td>
</tr>
<tr>
<td>2004-05</td>
<td>Int ind</td>
<td>%</td>
<td>133±9±3.9</td>
<td>89±3±3.2</td>
<td>112±6±3.7</td>
<td>69±1±4.2</td>
</tr>
<tr>
<td>2005-06</td>
<td>Int ind</td>
<td>%</td>
<td>87±8±3.1</td>
<td>69±3±2.7</td>
<td>65±2±7.2</td>
<td>59±4±2.4</td>
</tr>
<tr>
<td>2006-07</td>
<td>Int ind</td>
<td>%</td>
<td>76±8±3.0</td>
<td>73±4±2.9</td>
<td>98±4±3.1</td>
<td>46±7±2.1</td>
</tr>
<tr>
<td>2007-08</td>
<td>Int ind</td>
<td>%</td>
<td>100±2±1.0</td>
<td>100±8±0.8</td>
<td>99±1±9.4</td>
<td>100±1±0.8</td>
</tr>
<tr>
<td>2008-09</td>
<td>Int ind</td>
<td>%</td>
<td>124±9±3.8</td>
<td>127±1±3.8</td>
<td>153±1±4.1</td>
<td>49±2±2.1</td>
</tr>
<tr>
<td>2009-10</td>
<td>Int ind</td>
<td>%</td>
<td>100±1±0.8</td>
<td>100±1±1.2</td>
<td>126±6±2.5</td>
<td>33±1±2.5</td>
</tr>
<tr>
<td>2010-11</td>
<td>Int ind</td>
<td>%</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
</tr>
<tr>
<td>2011-12</td>
<td>Int ind</td>
<td>%</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
</tr>
<tr>
<td>2012-13</td>
<td>Int ind</td>
<td>%</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
<td>100±1±0.8</td>
</tr>
</tbody>
</table>

* Intensive indicator per 10 000 people in a given age group.
1 – ore-holiday period; 2- holiday period; 3 – post-holiday period.

Conclusions

School holidays resulted in a 13.4 – 63.6% and 10.2-61.6% decrease of the influenza and ARI morbidity level among school children and other groups of population respectively, therefore, closure of schools during an influenza epidemic can be a sufficiently effective anti-epidemic measure, which will reduce a burden on the healthcare system. Therefore, a qualitative criteria for an objective evaluating of severity of an epidemiological situation, which will define terms and duration of periods, during which schools will remain closed, needs to be developed.

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PERFORMANCE ASSESSMENT OF THERAPEUTIC DEPARTMENTS OF A MULTI PROFILE HOSPITAL BY PATIENTS

Key words: multi-profile hospital, therapeutic departments, medical care, patients’ satisfaction.

Abstract. The program for healthcare reform and development for 2011-2015 special emphasis is put on the multi-profile clinics development, ensuring qualified patient care and at the satisfaction level of the patients with the care provided. The main part of previous studies has been devoted to care provision, without emphasizing the multi-profile in-patient clinics, in particular general care departments. Most of the studies were done abroad, and only some publications in Kazakhstan. Patients’ opinion was not studied.

In course of this work patient opinion was studied for the general care departments of the multi-profile hospitals according to several criteria the level of medical care provided and the satisfaction of the patients. The studies were done in Central city clinical hospital of Almaty, which has 5 departments of general care profile with 135 beds. Main records and documents, as well as operational data on the performance of the departments in 2010 – 2012 have been analyzed, survey of 500 patients was done, with a questionnaire that allows to assess 17 indicators. The materials were processed with analysis of variance.

It was identified that the hospitalization waiting time by the patient in the admissions department for majority of hospitalized patients (76.6 %) was no more than 30 minutes, and within 2 hours 21.7% of patients were hospitalized. However with a confidence interval of 95% the number of such patients can reach 2.8%, forming a negative evaluation of the medical care. Another important element for quality of medical care provision in the in-patient department is regularity of patients’ assessments by the attending physicians. Almost all respondents were satisfied with the work of the attending physician. However one in 3 patients was not assessed by the Chair staff, which was seen as insufficient attention by the patients. Almost all patients have evaluated the work of doctors and nurses as excellent and good, they were satisfied with the medical care provided. Along with general satisfaction with the sanitary conditions of the rooms, 5% of the patients have expressed dissatisfaction with condition and frequency of sheets change, and 9% were dissatisfied with the quality and organization of catering in the in-patient department. Conclusions were drawn based on the results of the study.

Introduction

The state program for healthcare reforms and development «Salamatty Kazakhstan» for 2011-2015 has foreseen the development of multi-profile clinics, as institutions that could provide the best qualified treatment for the patients. The main amount of studies has been done on the issues of care organization, at the same time only limited studies were done on the issues of performance assessment in multi-profile in-patient clinics, namely the general care departments that take a significant share of the patients. Most of the studies were done abroad, and only some publications in Kazakhstan [1, 2, 3, 4, 5]. The works on studying the patient satisfaction with the provided care are almost nonexistent.

In the address of the President of the Republic of Kazakhstan to the nation of 6 February 2008 «Increase of citizens’ welfare – a main task of state policy» it was stated that healthcare system does not comply with the
requirements of the citizens [6]. Priority of the medical care quality has been defined in the State program for healthcare reforms and development for the period till 2010. And the medical care quality should be mostly ensured at the level of medical organization on the basis of patient satisfaction level [5, 7, 8, 9, 10, 11]. Some studies have been done for the assessment of sanitary and hygiene conditions in medical organizations [12], but the satisfaction level with medical care was rarely studied.

Taking into account all of the above mentioned on the need to have performance in the medical organization that is satisfying the patients, the objective of the research is to study according to the main indicators opinions of the patients in general care departments of a multi-profile hospital on the medical care provided and satisfaction level, provide recommendations, aimed at increasing the satisfaction level with the treatment and conditions of stay in the in-patient departments.

**Materials and methods**

As an object of the research Central city clinical hospital of Almaty has been chosen, in the structure of which there are 5 general care departments, including: therapy (budgetary and fee-based), neurology (budgetary and fee-based) and gastronephrology. The structure allows to consider this object as suitable for the objective set and an optimal research model.

Main records and materials (forms 14, 16, 003/Y,066/Y, 001/Y) and operational data on the departments performance for 2010 – 2012 have been analyzed. Surveys were done with 500 patients, who were receiving in-patient care in general care departments, on the principles of anonymity and voluntary participation. The questionnaire had 17 indicators, characterizing the activities of the departments and patients satisfaction. 12 questionnaires have been turned away, 488 have been statistically processed (in budgetary general care department -116 (23,8%), in fee-based general care department– 88 (18%), in budgetary neurology – 114 (23,4%, in fee-based neurology -80(16,4%), in gastronephrology -90(18,4%). The total number of questionnaires and number of respondents by departments allow to consider this material representative on qualitative and quantitative basis.

The material has been processed using analysis of variation with use of MSExcel and SPSS software. Standard deviation was identified in average relative numbers, Student t-test, justified use of which enables to draw conclusions on the materiality of the differences between the average numbers and/or get results for qualitative relations measurement [13, 14, 15].

**Results**

For study the patients’ opinions it is necessary to provide general characteristics of the departments. There are 135 beds (27% of the total beds number of the hospital), including: in budgetary and fee based general care department– 30 beds each; in budgetary neurology department– 30, in fee-based neurology – 20; in gastronephrology – 25. Medical care in general care departments is provided for all nosologies. In the last 3 years there were total of 6444 to 4758 patients treated. Decrease of the total patient number happened due to decrease of the number of beds in the departments, which is the case for the hospital in general.

Staffing of the general care departments with the medical personnel in the last 3 years is within the limits of 95-percent confidence interval (95% CI) is 83,7±93,0%, where staffing of the physicians in budgetary departments is 93,2±100,0% and fee-based departments 67,0±86,2%. Among the physicians in the general care departments 38,1% is under 40 years old, 42,9% – from 41 to 60 and 19,0% – over 60. Among the doctors 76,2% have work experience over 10 years, 57 % have the highest, and 14% first qualification categories. Of the nursing staff 72,4% is under 40, and 41,4% of nurses have less than 5 years experience.

Among the respondents there were significantly more women – 334 (68,4 ± 2,10 %), than men – 154 (31,6 ± 2,10 %) and the ma-
majority of the respondents (75.2%) was over 40 years old (Table 1). The patients in the age group 41 to 50 comprise 33.6% to the total number of all respondents. It can be assumed that the peculiarities of age and gender structure are typical in general to all general care departments.

A significant criterion for the timely nature and quality of care provision in the inpatient department is the waiting time in the admissions department. It was defined (table 2) that for the majority of the patients (76.6 ± 1.92%) the waiting time was no more than 30 minutes, and 21.7% patients were hospitalized in the time frame of 2 hours.

**Table 1 – Age distribution of the respondents**

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of respondents abs.</th>
<th>X±S,X% to total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>49</td>
<td>10,0 ± 1,36</td>
</tr>
<tr>
<td>31-40 years</td>
<td>72</td>
<td>14,8 ± 1,68</td>
</tr>
<tr>
<td>41-50 years</td>
<td>164</td>
<td>33,6 ± 2,13</td>
</tr>
<tr>
<td>51-60 years</td>
<td>122</td>
<td>25,0 ± 1,97</td>
</tr>
<tr>
<td>51-60 years</td>
<td>81</td>
<td>16,6 ±</td>
</tr>
<tr>
<td>Total</td>
<td>488</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 2 - Respondents distribution by waiting time in the admissions department**

<table>
<thead>
<tr>
<th>Waiting time in the admissions department</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Abs.</td>
</tr>
<tr>
<td>Under 30 minutes</td>
<td>374</td>
</tr>
<tr>
<td>Under 1 hour</td>
<td>41</td>
</tr>
<tr>
<td>Up to 2 hours</td>
<td>65</td>
</tr>
<tr>
<td>Over 2 hours</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>488</td>
</tr>
</tbody>
</table>

However 8 patients out of 488 were hospitalized in more than 2 hours after coming to the admissions department. Despite the fact that the share of such patients is insignificant (95% CI is 0,6 ± 2,8 per cent), this fact causes dissatisfaction with the medical care among these patients.

Another important element for characterizing the quality of medical care in the inpatient department is the regularity of assessment by the attending physician. All respondents have noticed daily assessments, and 23.4% of them stated assessment 2 times per day. Furthermore all patients have been assessed by the head of the department. That correlates good with the fact that all respondents were satisfied with the work of the attending physician.

Staff of the chairs (associate professors or professors), based in the department, assessed 326 of 488 respondents (66.8%), whereas 1 in 3 patients has not been assessed, which patients noted as insufficient attention to them.

The work of the departments’ physicians has been evaluated as excellent by 212 patients (43.4 ± 2.24%), «good» by 272 patients (55.7 ± 2.25%). Only 4 patients have evaluated it as «satisfactory». Despite the positive evaluation of general work of the physicians, the fact that there are more evaluations as «good», rather than «excellent» cannot be avoided. At the same time nurses’ work has been evaluated as «excellent» by 52.7% of the respondents, and «good» by 46.5%.

It correlates with the fact that all 488 respondents are satisfied with the medical care provided in the general care departments. At the time of discharge 107 (22%) patients
have assessed their condition as «excellent», 374 (76,6%) - as «good», 7 (1,4%) – as «not bad». Almost all respondents have noticed subjective feeling of improvement. Only one patient, who has been in the in-patient care for 2 days, has stated lack of changes.

All respondents are satisfied with the sanitary condition of the rooms, however about 5% of patients have expressed dissatisfaction with the conditions and frequency of sheets change and 9% dissatisfaction with quality and organization of catering in the in-patient department.

Discussion

The patients, who get treatment in the general care department of multi-profile hospital comprise about 25% of the total number of patients in the clinic. Therefore, subjective assessment by these patients of the medical care, satisfaction with the treatment and conditions of stay in the in-patient department significantly reflect the opinion on medical organization that is formed among the patients and community.

According to the study results, multi-profile clinics that has been chosen as an object, complies with the requirements of state program «Salamatty Kazakhstan» as an institution that provides high-quality treatment for patients and as a medical organization that in general satisfies the patients. It relates to the quality of medical care as well. At the same time in majority of the developed countries ensuring quality of medical care is the most significant task in solving the problem of population health protection. In preparation and implementation of the medical care quality program in accordance with the WHO recommendations, not only clinical and economic criteria have been defined as priorities (medical technologies, risk of medical intervention calculation, optimal use of resources), but patient satisfaction with the quality of medical care as well. It is known that in cases of dissatisfactory level of medical care the population has more criticism to the level of medical care [9, 16, 17, 18].

An undoubted positive sign of the chosen multi-profile clinics is high staffing level with medical personnel. More than 75% of the physicians have over 10 years of experience, and about 60% have the highest qualification category.

A relatively high evaluation of the medical care by the patient is also justified by the quick decisions on hospitalization in admissions department. However, for 2–3 per cent of the patients the waiting time for hospitalization was over 2 hours.

Almost all respondents are satisfied by the medical care, provided in general care departments. At the time of discharge 98% of the patients have assessed their condition as good and excellent. This correlates with satisfaction with the attending physician’s work, daily assessment, and in 25% of the cases assessment twice a day. All patients have been assessed by the head of the department. About 45% of patients have assessed the work of the physicians as excellent and about 55% as good. Work of nurses has been rather highly evaluated.

A significant share of patients (about 70%) have been seen by an associate professor or professor of the chair based in the clinics. At the same time one of 3 patients has not been seen, which was naturally seen as insufficient attention to them.

Speaking of the medical care provision in the in-patient department assessment of sanitary-hygiene conditions should be noted. With a general positive assessment of the sanitary state of the patient rooms about 5% (over 20 patients) have expressed dissatisfaction with the condition and frequency of sheets change, and about 9% (over 40 patients) with the quality and organization of catering.

As a result of the patients survey in general care departments rather objective data on the quality and level of medical care provision have been gathered, some disadvantages have been identified.

Conclusions

1. Multi-profile clinic, chosen as research object is in compliance with the re-
requirements of State program «Salamatty Kazakhstan» as an institution that provides high quality patients’ treatment and is generally satisfactory for the patients.

2. Women (about 70%) and individuals over 40 years old (75%) prevail in the structure of the general care departments. It can be assumed that these peculiarities of age and gender are typical for all general care departments.

3. Waiting time in the admissions department for the decision on hospitalization over 2 hours causes dissatisfaction among the patients with the medical care, therefore measures should be taken to prevent such cases in the future, even though these are some individual cases (2 – 3 per cent of all patients).

4. 1 in 3 patients has not been assessed by the chair staff, which patients note as insufficient attention to them. It is reasonable to explain to those patients, who have not been assessed the reasons for such decision.

5. Despite positive assessment of sanitary conditions in the rooms, part of the patients is not satisfied with the condition and frequency of sheets change, quality and organization of catering.

6. Survey for the patients of multi-profile clinic allows getting rather objective data on the level of medical care provision, some of its qualitative features, identifying gaps in the performance. It is reasonable to conduct random surveys periodically in order to identify the satisfaction level with the medical care provided, identify the gaps, which need managerial decision-making.

References


6. Address of the President of the Republic of Kazakhstan N.A. Nazarbayev to the nation of 6 February 2008 «Increasing wealth of the citizens of Kazakhstan – a main goal of state policy ».


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ASSESSMENT OF HIV-INFECTION PREVALENCE BASED ON THE RESULTS OF SENTINEL SURVEILLANCE IN ZHAMBYL REGION

Key words: epidemic, HIV-infection, prevalence, sentinel surveillance, vulnerable groups of population, prevention, AIDS prevention center, Zhambyl region.

Abstract. HIV-infection problem, the pandemic of which has been in place for 3 decades and that covers more and more countries and population groups, remains one of the topical problems in science and public healthcare. According to the opinion of WHO, UNAIDS experts risk of potential spread of HIV-infection can be decreased by means of developing and implementing new technologies of epidemiological surveillance. Since 2005 in Kazakhstan with methodological and technical assistance from CDC, UNAIDS there has been a staged implementation of a new innovative for the country program of sentinel surveillance.

The aim of the work is to assess prevalence of HIV-infection among vulnerable population groups of Zhambyl region based on the results of sentinel surveillance.

In the work there have been epidemiologic, laboratory and statistical methods used. The study was done on the basis of Zhambyl regional AIDS prevention center together with the specialists of the epidemiology and emergencies course of the Higher school of public health. Analysis of HIV-infection prevalence among vulnerable groups (VG) was done on the basis of annual sentinel studies among the population of injected drug users (IDU), sex workers (SW), men, having sex with men (MSM), convicts for years 2006-2012. Sample selection was done in accordance with the recommendations of the Republican AIDS prevention center (2010). Sample size was defined separately for each population group with the help of Epi-Info software, maximum sta-
istical discrepancy with the 95% confidence interval was 5.0%. On the laboratory stage there was a linked anonymous HIV testing done with the help of enzyme-immunoassay (EIA) with pre- and post-testing consults.

**Quantitative data on HIV-infection prevalence among vulnerable population groups in Zhambyl region** have been gathered. In the period 2006-2012 prevalence indicators on average were among IDU – 2.1%, among SW – individual cases, among MSM – 1.0%, among convicts – 1.3%.

**Sentinel surveillance** proves activation of epidemic process of HIV-infection among IDU, SW, MSM, convicts. The methodology of HIV-infection sentinel surveillance, implemented in the region, allows estimate with reliability HIV prevalence among vulnerable population groups, gives additional information about the scale, nature and epidemic development trends in the region at a given period of time.

**Introduction**

At the end of 20th century there have been significant changes in the infectious diseases structure in many countries of the world. The so-called «emerging and re-emerging infectious diseases» appeared. The diseases that seemed to be killed have gained wide popularity, such as syphilis, diphtheria, tuberculosis, circulation of some pathogenic agents has started again, there appeared a large group of infectious diseases that were not known before – bacterial ( legionaries’ disease, Lyme disease), viral ( viral hepatitis C ,D, E, hemorrhagic fevers ) [1-3]. The authors note that emerging and re-emerging diseases have potentially severe, often very severe clinical progression. Among them more and more attention is paid to HIV-infection due to the spread rates, quick finish with 100 % mortality.

Currently according to the estimates of international experts [4,5], HIV epidemic has stabilized on the global scale, however the levels of new HIV-infection and death from AIDS cases have stayed unacceptably high. In Kazakhstan according to the data of the Republican AIDS prevention center as of 1.01.2013 with an increase 19784 cases of HIV-infection have been registered, 1278 died from AIDS, including 8 children under 14.

Lack of effective treatment and vaccination means currently does not allow the healthcare organs and institutions conduct a full complex of activities to fight against HIV-infection epidemic. At the same time modern approach to fighting against HIV-infection is largely defined by the scientifically based system of epidemiologic surveillance. Let us note, that modern epidemiological surveillance concept over HIV-infection has started to be implemented only in the last 20 years. According to the data of some research [6,7], the concept of epidemiological surveillance was dominant in the CIS space, including Kazakhstan, which was based on a mandatory HIV testing. Later new epidemiological surveillance technologies were developed. These include sentinel surveillance (biological and behavioral), «enhanced» systems HIV of epidemiological surveillance – infection of second generation.

Along with official HIV-infection cases registration an innovative program of sentinel surveillance is widely used in Kazakhstan, it is an important component of the monitoring and evaluation system for the programs against HIV-infection on the national and regional levels. Sentinel surveillance was first introduced in the republic in 2005 on the national level and since that has been conducted on an annual basis in the regional centers and some big regional cities, where there are subdivisions of AIDS prevention services. Let us note that sentinel surveillance is mostly targeted at gathering information from the vulnerable population groups for the purpose of assessing HIV prevalence among them and behavioral risk-factors.

**The aim** of this work is to assess HIV prevalence among vulnerable population
groups of Zhambyl region based on the results of sentinel surveillance.

Materials and methods

The study was done on the basis of Zhambyl regional AIDS prevention center together with the specialists of the epidemiology and emergencies course of the Higher school of public health.

The following materials comprised the basis of the study:

- Data on the EIA tests for HIV-infection (statistic form №4) for 2006-2012;
- Results of field studies of HIV-infection sentinel surveillance (serological part) among the population of injected drug users (IDU), sex workers (SW), men, having sex with men (MSM), convicts for years 2006-2012.

In the work there have been epidemiological, laboratory and statistical methods used.

Field studies for sentinel surveillance in their design were single-step cross-sectional studies, in which prevalence indicator (P) has been calculated. This indicator is used for quantitative description of the morbidity and takes into account not only those diseases that appeared in the given period of time, but all that are seen in the observed period, i.e. disease prevalence level is described, in our case HIV-infection in the studied sentinel groups [8]. In the quantitative form the prevalence indicator (P) is calculated according to the formula below:

\[ P = \frac{D}{N}, \]  

(1)

Where P – prevalence indicator;

D – number of all existing cases of diseases at a given moment; N – quantity of population studied.

Sample selection was done in accordance with the recommendations of the Republican AIDS prevention center (2010) [9]. Sample size was defined separately for each population group with the help of Epi–Info software, maximum statistical discrepancy with the 95% confidence interval was 5.0%.

In sentinel surveillance in IDU group there was snow-ball sampling method used.

Population in question – IDU, those, who use drugs with injections for 12 months prior to study date, living for this period of time on the territory of sentinel site. Inclusion criteria: membership in IDU group; age 16 and above; oral informed consent.

HIV-infection sentinel surveillance among SW was done in sex workers location (clusters). Studied population – women age 16 and above, providing sex services for remuneration for 12 months, prior to the study date.

HIV-infection sentinel surveillance among MSM was also done using the snow-ball sampling in their locations, where they have gathered to find sexual partners and communicate (hotels, restaurants, bars, apartments). The data on the location were provided by MSM themselves – volunteers of AIDS prevention center. Studied population – men, having oral or anal sex with other men for the last 12 months and who have not participated in similar studies for the period of sentinel surveillance.

Convicts in the HIV-infection sentinel surveillance were represented by those individuals, who have been imprisoned for more than 6 months prior to the study date. Respondent selection was done according to the systematic random sampling based on the convicts’ list.

On the laboratory stage there was a linked anonymous HIV testing done with the help of enzyme-immunoassay (EIA) with pre- and post-testing consults. Capillary blood drawing was done to the filtered test-cards (Dry blood spot – DBS method). Serologic study included 2 stages: screening (diagnostic testing systems for HIV of Russian origin were used), expert (confirmation of all positive and 10% of negative results was done using testing systems from «Muret» company). Biological material of each participant was coded, everyone had an identification code. Only the study participant could identify himself with the results of HIV laboratory testing.

On each stage statistical processing of the results was done, average error – m was calculated, reliability of the difference of aver-
age indicators was defined based on the Student’s test – t, with p ≥ 95%.

Results

Analysis of epidemiological situation with HIV-infection in Zhambyl region has shown that as of 01.01.2013 with an increase there were 712 cases of HIV-infection identified, among them 12 cases in children under 14. Cumulative morbidity indicator in the region was 55,3 per 100 thousand population, with a republican indicator being – 94,1 per 100 thousand population.

Table 1 presents data on prevalence of HIV-infection among studied vulnerable groups (IDU, SW, MSM, convicts) according to the results of sentinel surveillance for the period of 2006-2012 in %.

<table>
<thead>
<tr>
<th>Name of VG</th>
<th>Years</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDU</td>
<td></td>
<td>1,3±1,0</td>
<td>5,7±1,4</td>
<td>2,0±1,0</td>
<td>0,4±0,2</td>
<td>2,6±1,0</td>
<td>0,9±0,6</td>
<td>1,7±0,8</td>
</tr>
<tr>
<td>SW</td>
<td></td>
<td>2,4±1,4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>MSM</td>
<td></td>
<td>-</td>
<td>-</td>
<td>1,0±0,9</td>
<td>1,0±0,9</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Convicts</td>
<td></td>
<td>0,6±0,4</td>
<td>1,7±0,7</td>
<td>1,7±0,7</td>
<td>1,7±0,7</td>
<td>1,7±0,7</td>
<td>0,6±0,4</td>
<td>0,9±0,5</td>
</tr>
</tbody>
</table>

From the table it can be seen that prevalence indicators (P) among IDU have been fluctuating in different years from 0,4% to 5,7. On average HIV prevalence among IDU was 2,1%. Among the SW the studies have identified 3 cases of HIV-infection in 2006, prevalence indicator (P) being 2,4±1,4%. Among MSM sentinel surveillance has identified 1 case of HIV-infection in 2008 and 2009 each, prevalence indicator (P) was 1,0±0,9 and 1,0±0,9 respectively. Among convicts prevalence indicator (P) was fluctuating from 0,6% to 1,7%, on average– 1,3 %.

Discussion

The study has shown that Zhambyl region based on the level of cumulative HIV-infection morbidity is among the regions with average level of infection (HIV prevalence from 30 to 100 per 100 thousand population, operational classification of M.A. Khasanova, M.K. Saparbekov, 2010) [10].

However, despite stable nature of HIV spread among population of the region, the given sentinel surveillances in the period of 2006-2012 prove that epidemic process of HIV-infection actively involves vulnerable population groups. These are injected drug users, sex workers, men, having sex with men, convicts.

The highest prevalence indicator (P) as it has been shown above in the studied period was among IDU – 2,1%. This indicator, characterizing HIV prevalence in the population of IV drug addicts does not exceed the «threshold» level (5%) of «concentrated» stage of epidemic (UNAIDS classification, 2008) [11]. Comparison of the HIV prevalence indicators identified as the results of sentinel surveillance in Zhambyl region with corresponding indicators in other regions of Kazakhstan shows that HIV prevalence among IDU in the country is not homogeneous. So, according to the data of L.Yu. Ganina et al. (2012), prevalence indicators (P) among IDU in the republic based on the results of sentinel surveillance in 2010 varied from 0% to 13,7%, in 2011 – from 0% to 18,0% [12]. Such uneven distribution picture of the HIV prevalence indicators among IDU is probably related to the fact that regions of the country are now on the different stages of epidemic process. Furthermore one of the reasons for varied indicators is the...
presence of systematic and random errors, which usually distort the results of epidemiologic studies. Therefore, when doing sentinel surveillance it is necessary to pay attention first of all to standardization of study measurement tools, i.e. all means of data collection: starting with questionnaire to laboratory tests.

Monitoring of HIV-infection prevalence among sex workers (SW) plays an important role in development and efficiency analysis of HIV/AIDS prevention programs. In our sentinel studies HIV prevalence among SW population in 2006 was 2.4%, which is below the «threshold» level of the «concentrated» epidemic stage almost 2,1 times. Despite low prevalence indicators among population of SW, this group in the studied region is one of the vulnerable groups both from standpoint of getting infected themselves with HIV and from standpoint of their potential role in transmitting the infection to the clients. Let us note that in the CIS, including Kazakhstan sexual transmission way plays increasingly bigger role in development of HIV-infection epidemic [5-9]. It has been noted that SW population is vulnerable to HIV-infection due to large number of sexual partners, lack of sexual behavior control mechanism, low level of awareness, migration, engaging into alcohol and drugs abuse.

Sentinel surveillance in Zhambyl region has identified 1 case of HIV infection among MSM population in 2008 – 2009 each, which is a sign of rather good epidemiologic situation with HIV in this population. In Kazakhstan MSM are a closed target group, because there is high risk of stigmatization and discrimination among population. This factor is largely a serious obstacle to getting objective epidemiologic data. But there are studies [13] showing that HIV-infection prevalence among MSM in many cities of East Europe and Central Asia is up to 10 times higher than among the population in general.

Literature data [3-6,14] show that HIV-infection in penitentiary institutions is spreading rather quickly, and the main epidemiologic risk factors are joint injections with use of non-sterile tools and unprotected sexual intercourse, primarily homosexual. The study has identified annual stable prevalence rate of HIV-infection among convicts of Zhambyl region (on average, for the studied period the prevalence indicator was 1,3%). It was established that majority of HIV cases among convicts was related to infection prior to penitentiary institution of Zhambyl region, except 1 case of HIV infection in convict, who was infected inside the penitentiary institution. Taking into account that more than half of convicts have experience of drug abuse, presence of internal HIV reservoir in penitentiary system of Zhambyl region is a negative forecasting sign, because it can contribute to quick HIV spread in penitentiary system of the region.

Therefore, the studies on assessment of HIV-infection prevalence among IDU, SW, MSM and convicts have shown, that sentinel surveillance methodology is an important HIV-infection monitoring tool, allowing to define HIV prevalence level among vulnerable population groups, who have high HIV infection risk, in order to get comprehensive information for further use for the purposes of the most effective interventions to improve public health condition in the region.

Conclusions

1. HIV-infection prevalence according to the data of sentinel surveillance on average in Zhambyl region is as follows: among the injected drugs users – 2,1%, among sex workers – individual cases, among men, having sex with men – 1,0%, among convicts – 1,3%.

2. Methodology of HIV-infection sentinel surveillance implemented in Zhambyl region allows to assess prevalence of HIV among vulnerable population groupw, fives additional information on the scale, nature and development trends of HIV/AIDS epidemic in the region at a given period of time.
References

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