дисбалансу мікробних асоціацій у вигляді зменшення коменсальної мікрофлори та збільшення умовно-патогенної мікрофлори.

Ключові слова: мікробіота ясеневої борозни, еубіоз, дисбіоз, психоемоційний стрес.

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усиление дисбаланса микробных ассоциаций в виде уменьшения коменсальной микрофлоры и увеличения условно-патогенной микрофлоры.

Ключевые слова: микробиота десневой борозды, эубиоз, дисбактериоз, психоэмоциональное напряжение.

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THE SCOPE OF INPATIENT MORTALITY DUE TO SAFETY INCIDENTS IN DOMESTIC HOSPITALS

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The problem of unintentional harm to patients is common in all countries, and especially in low- and middle-income countries. The article analyzes methodological approaches to assessing the levels of patient safety incidents in healthcare institutions. It has been established that more than 18 thousand patients die in Ukraine as a result of adverse events that can be prevented, which is significantly more than the number of victims of road traffic accidents and industrial accidents. The data obtained indicate the extreme urgency of the problem of unintentional harm to patients and the need for urgent measures to improve patient safety in domestic health care facilities. The purpose of the work was to assess patients' mortality scope due to safety incidents in domestic hospitals. Were analyzed thematic scientific publications, statistical directories of the Center for Medical Statistics of the Ministry of Health of Ukraine, national reports, and analytical reviews on the state of man-made and natural safety in Ukraine.

Keywords: incident, patient safety, health care, inpatient mortality, unintentional harm.

The work is a fragment of the research project "Science on the establishment of an optimal risk management system to ensure a safe medical environment", state registration No. 0120U101432.

During the provision of medical care, along with the benefit to the patient, for various reasons and primarily due to errors of medical personnel and other reasons that can be prevented, prerequisites for harm or harm to the patient arise, that is, patient safety incidents occur [9]. The adverse events (an incident that caused damage) caused by the unsafe treatment or patient care (organizational, diagnostic, treatment errors, traumatizing of patient in a healthcare facility as a result of a fall, injury by physical, chemical, or biological factors, etc.) is considered nowadays one of 10 [10], and in some studies [11] one of 3 leading causes of death and disability worldwide.

The terms "patient safety incident" and "adverse event" are used interchangeably in most works. In addition, phrases such as "unintentional harm" and "preventable harm" are used identically.

The problem of patient safety is extremely relevant for countries with low and middle incomes [10]. In addition to medical and social aspects, the problem of patient safety has a significant economic component. It has been established [14] that up to 15% of the funds allocated for inpatient care are spent on the treatment of patient safety cases.

Data on patient safety incidents and their consequences have prompted the international community and some countries to take large-scale measures to minimize this problem. Only in 2018¬2019 were adopted four thematic declarations, two of which were initiated by the WHO [2,3].These declarations mention, among other things, the significant potential for creating a hospital environment that is safe for patients.

As for Ukraine, there have been practically no research on prevalence estimates of patient safety cases incidents and their consequences, except in certain areas of medical practice, such as anesthesiology and intensive care [7].

The available data on the extension of unfavorable for patient health care cases are questionable.

Thus, officially according to the Y40-Y84 codes (complications due to therapeutic and surgical interventions) of the International Classification of Diseases (ICD 10) in Ukraine in 2017 were registered 1,334 deaths [1]. We have similar values for this indicator for 2018.

But there is reason to suppose that these figures are significantly underestimated [4,5], which, in our opinion, explains the underestimation of the problem of patient safety in Ukraine.

The best option for assessing the scale of the negative consequences of patient safety incidents in domestic hospitals would be to establish them by analyzing primary medical materials, and we are doing

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this work. However, other approaches can be used to make a preliminary assessments of the consequences of health care defects.

Thus, it is believed [8] that the level of in-patient mortality due to errors of medical personnel exceeds the number of victims of road traffic accidents (accidents) and victims of occupational traumatism combined.

This approach is valuable because the number of victims of accidents and occupational traumatism in Ukraine is fairly accurately recorded.

In this regard, there may be interesting approaches derived from the analysis of the frequency of adverse events in 26 hospitals in eight middle-income countries [13,15]. These studies found that the level of adverse events in these countries was about 8% for hospital patients, and almost a third of them (30%) had safety incidents directly or indirectly related to their deaths. Again, in the reports of the Center for Medical Statistics of the Ministry of Health of Ukraine, one can easily find data for recent years on the number of patients treated in domestic hospitals.

Patient mortality from safety incidents can also be estimated using data from the US National Academy of Engineering and Medicine (NASEM) [12]. It is estimated that 134 million adverse events occur each year due to unsafe care in hospitals in low- and middle-income countries, resulting in 2.6 million patient deaths.

The above methodological approaches to assessing the levels of unintentional harm to patients, as well as the relationship between the number of safety incidents and the disability and patient mortality as a result, can be used for similar estimates in domestic health care.

Thus, knowledge of the extent of harm to patients is important information for the medical and patient communities, as well as an important prerequisite for making appropriate decisions to improve patient safety.

The purpose of the work was to assess patients' mortality scope due to safety incidents in domestic hospitals

Materials and Methods. Were analyzed thematic scientific publications, statistical directories of the Center for Medical Statistics of the Ministry of Health of Ukraine, national reports, and analytical reviews on the state of man-made and natural safety in Ukraine.

Research methods used in the study were bibliosemantic, statistical, mathematical. Approaches to assessing the consequences of unintended harm to patients, proposed by the Organization for Economic Co-operation and Development (OECD) in their projects [14].

Results of the study and their discussion. Based on the judgment [8] that the inpatient mortality rate due to errors of medical personnel exceeds the sum of victims of accidents and injuries at work, we found that for this reason more than 10,770 people die in domestic hospitals. This figure is the sum of the number of deaths due to the road traffic accidents in 2007 (9,589 people) and the number of fatal industrial injuries in the same year (1,181 people) in Ukraine.

2007 was adopted as the base year, as it was then that the maximum mortality rates of Ukrainian citizens as a result of road accidents were recorded. Lately, at all levels, were taken the effective measures to improve a road safety. Also, until 2007, attention to patient safety, occupational safety and health, and road safety was roughly equally insufficient. In contrast to the indicators of fatal occupational injuries and deaths from road accidents, which, according to the State Statistics Service of Ukraine, tend to decrease after 2007, the rate of inpatient mortality, as before 2007, continues to grow [6].

That is, today the mortality rate of patients due to safety incidents is possibly much higher.

Taking into account the data [8,10] and considering that in 2007 in domestic hospitals were treated 11,732,456 people, according to the Center for Medical Statistics of the Ministry of Health of Ukraine, we receive 938,600 people (8% from11,732,456 treated in hospitals in 2007), who could be exposed to a medical error or other adverse event. Accordingly, in 30% of people, ie 281,580 out of 938,600, medical care defects were the main or indirect cause of death. If we assume that only in one of ten of these people medical care defects was the main cause of death, it is 28,158 people.

In addition, according to the NASEM data logic [12], we find that 1.94% of patients (2,600,000 patient deaths per 134,000,000 adverse events) who are caused unintentional harm, die. We have already noted above that in 2007 about 938,600 people suffered damage in Ukrainian hospitals while receiving medical care and 1.94% of this number - 18,208 people.

Summarized data on the calculation of patient mortality due to defects in medical care are given in the table. We see that the values of inpatient mortality rates, which could be avoid due to preventable reasons, obtained by different methodological approaches are quite close, and the average value exceeds 18 thousand people.

Table

Data on patient mortality in domestic HCFs through safety incidents according to different methodological approaches and ratios

Scientific sources of methodological approaches and ratio for assessing the scale and consequences of unintentional harm to patients	Estimates of mortality in domestic CHCs due to safety incidents, persons
Baker T., 2005 [8]	> 11 951
Wilson R.M. et al., 2012 [15]	28 158
NASEM, 2018 [12]	18 208
Average	> 18 262

Measures taken at various levels have had a positive impact on the safety of road users and the safety of workers. According to the State Emergency Service of Ukraine [1], in 2017 the death rate from road accidents was 4,529 people, and as a result of industrial injuries - 366 people, that is, the mortality in these areas has decreased more than twice compared to 2007. Whereas inpatient and postoperative mortality as indicators of patient safety after 2007 tends to increase [6] due to lack of proper attention to the problem [5]. That is, the problem of patient safety due to its negative medical, social and demographic consequences is much more relevant today than fatal injuries due to road accidents and fatal occupational injuries, which require urgent measures to minimize patient safety incidents.

Conclusions

1. The problem of unintentional harm to patients is common in all countries, and especially in low- and middle-income countries.

2. Each year more than 18 thousand patients die in hospitals due to reasons that could be prevented.

3. The number of patients who die in domestic health care facilities exceeds the number of victims of road traffic accidents and victims of occupational traumatism combined.

4. The problem of patient safety in Ukraine, given its relevance, requires in-depth research and priority attention from the state authorities to minimize it.

References

1. Analitychnyy ohlyad stanu tekhnohennoyi ta pryrodnoyi bezpeky v Ukrayini za 2017 rik. Ukrayinskyy naukovo-doslidnyy instytut tsyvilnoho zakhystu. Kyiv: 2018. 345 c. Dostupno na: https://www.dsns.gov.ua/files/ prognoz/report /2017/%D0%_2017.pdf. [in Ukrainian]

2. Bezopasnost patsiyentov. Vodosnabzheniye, sanitariya i gigiyena v uchrezhdeniyakh zdravookhraneniya. Doklad Generalnogo direktora VOZ. A72/27.t. 2019. Dostupno na: https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_27-ru.pdf. [in Russian]

3. Globalnyye deystviya po obespecheniyu bezopasnosti patsiyentov. WHA72.6. 28 maya 2019 g. BO3. A72/VR/7. 2019. Dostupno na: https://apps.who.int/gb/ebwha/pdf _files/WHA 72/A72_R6-ru.pdf. [in Russian]

4. Pylypenko MI, Stadnyk LL, Ryhan MM, Skaletskyi YuM, Shalyopa OYu. Medyko-sotsialni naslidky problem bezpeky patsiyentiv v onkoradiolohiyi. Problemy radiatsiynoyi medytsyny ta radiobiolohiyi. 2015; 20: 204–214. Dostupno na: http://www.radiationproblems.org.ua/20_2015_ru_s204.html [in Ukrainian]

5. Serdyuk AM, Ryhan MM, Naumenko OM, Asaulyuk IK, Skalets′kyy YUM. Pytannya bezpeky khvorykh u systemi zabezpechennya yakosti nadannya medychnoyi dopomohy. Likarska sprava. 2017; 12 (1141) 149155. [in Ukrainian]

6. Skaletskyi YuM, Yavorovskyi OP, Hychka SH, Ryhan MM, Didkovskyi VL, Brukhno RP. Tendentsiyi statsionarnoyi ta pislyaoperatsiynoyi letalnosti yak pokaznykiv bezpeky patsiyentiv v Ukrayini. Ukrayinskyi medychnyi chasopys. 2020; 3 (137) 2: 3841. . [in Ukrainian]

7. Fedosyuk RM, Kovalyova OM, Slabkyy HO. Medyko-sotsialne obgruntuvannya systemy bezpeky patsiyentiv i potentsiynykh shlyakhiv yiyi implementatsiyi u sluzhbi anesteziolohiyi ta intensyvnoyi terapiyi Ukrayiny. Ukrayina. Zdorovya natsiyi. 2018; 1(47): 9099. [in Ukrainian]

8. Baker T. Reconsidering the Harvard Medical Practice Study Conclusions about the Validity of Medical Malpractice Claims. T. Baker. Journal of Law, Medicine & Ethics.– 2005. – № 10. – P. 4.

9. Brian McCaughan, Clifford F Hughes, OPEN DISCLOSURE HANDBOOK. McCaughan Brian, F Hughes Clifford, 2014. 92 p. Available at: http://www.cec.health.nsw. gov.au /__data/assets/pdf_file/0007/258982/CEC-Open-Disclosure-Handbook.pdf.

10. Jha AK. Presentation at the "Patient Safety – A Grand Challenge for Healthcare Professionals and Policymakers Alike" a Roundtable at the Grand Challenges Meeting of the Bill & Melinda Gates Foundation, 18 October 2018. Available at: https://globalhealth.harvard.edu/ qualitypowerpoint.

11. Makary Martin A. Medical error—the third leading cause of death in the US. Martin A Makary, Michael Daniel. BMJ 2016; 353:i2139. Available at: https://doi.org/10.1136/bmj.i2139.

12. National of Sciences, Engineering, and Medicine. Crossing the global quality chasm: Improving health care worldwide. Washington (DC): The National Academies Press; 2018. Available at: https://www.nap.edu/catalog/25152/crossing-theglobal-quality-chasm-improving-health-careworldwide.

13. Patient safety in developing and transitional countries. New insights form Africa and the Eastern Mediterranean. Geneva: World Health Organization; 2011. Available at: http://www.who.int/patientsafety/research/emro_afro_report.pdf?ua=1.

14. Slawomirski L, Auraaen A, Klazinga N. The economics of patient safety: Strengthening a value-based approach to reducing patient harm at national level. OECD Health Working Papers. Paris: OECD Publishing; 2017. 96.s. Available at: http://dx.doi.org/10.1787/5a9858cd-en.

15. Wilson RM, Michel P, Olsen S, Gibberd RW, Vincent C, El-Assady R et al. Patient safety in developing countries: retrospective estimation of scale and nature of harm to patients in hospital. BMJ. 2012; 344:e832. Available at: https://doi.org/10.1136/bmj.e832, accessed 18 June 2020).

Реферати

МАСШТАБИ СТАЦІОНАРНОЇ ЛЕТАЛЬНОСТІ ПАЦІЄНТІВ ЧЕРЕЗ ІНЦИДЕНТИ БЕЗПЕКИ У ВІТЧИЗНЯНИХ ЛІКАРНЯНИХ ЗАКЛАДАХ

Науменко О.М., Скалецький Ю.М., Риган М.М., Дідковський В.Л.

Проблема ненавмисної шкоди пацієнтам властива для всіх країн, і особливо для країн з низьким і середнім рівнем доходів населення. У статті проаналізовано методичні підходи до оцінки рівнів інцидентів безпеки пацієнтів у закладах охорони здоров'я. Установлено, що внаслідок несприятливих подій, які можна попередити, в Україні помирає більше 18 тис. пацієнтів, що значно більше, ніж кількість жертв унаслідок дорожньо-транспортних пригод і нещасних випадків на виробництві. Отримані дані свідчать про надзвичайну актуальність проблеми ненавмисної шкоди пацієнтам і потребу в невідкладних заходах з покращення безпеки пацієнтів у вітчизняних закладах охорони здоров'я. Метою роботи була оцінка масштабів летальності пацієнтів через інциденти безпеки у вітчизняних лікарняних закладах. Під час підготовки публікації аналізувалися тематичні наукові публікації, статистичні довідники Центру медичної статистики МОЗ України, національні доповіді та аналітичні огляди про стан техногенної та природної безпеки в Україні.

Ключові слова: інцидент, безпека пацієнтів, охорона здоров'я, стаціонарна летальність, ненавмисна шкода.

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МАСШТАБЫ СТАЦИОНАРНОЙ ЛЕТАЛЬНОСТИ ПАЦИЕНТОВ ИЗ-ЗА ИНЦИДЕНТОВ БЕЗОПАСНОСТИ В ОТЕЧЕСТВЕННЫХ ЛЕЧЕБНЫХ УЧРЕЖДЕНИЯХ

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Проблема непреднамеренной вреда пациентам свойственна для всех стран, и особенно для стран с низким и средним уровнем доходов населения. В статье проанализированы методические подходы к оценке уровней инцидентов безопасности пациентов в учреждениях здравоохранения. Установлено, что в результате неблагоприятных событий, которые можно предупредить, в Украине умирает более 18 тыс. пациентов, что значительно больше, чем количество жертв в результате дорожно-транспортных происшествий и несчастных случаев на производстве. Полученные данные свидетельствуют о чрезвычайной актуальности проблемы непреднамеренного вреда пациентам и потребность в неотложных мероприятиях по улучшению безопасности пациентов в отечественных учреждениях. Цель работы - оценка масштабов летальности пациентов из-за инцидентов безопасности в отечественных лечебных учреждениях. При подготовке публикации анализировались тематические научные публикации, статистические справочники Центра медицинской статистики Минздрава Украины, национальные доклады и аналитические обзоры о состоянии техногенной и природной безопасности в Украине.

Ключевые слова: инцидент, безопасность пациентов, здравоохранение, стационарная летальность, непреднамеренный вред.

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ASSESSMENT OF THE FUNCTIONAL TYPES OF BODY MOBILIZATION BASED ON A DYNAMIC ANALYSIS OF SPECTRAL INDICATORS OF HEART RATE VARIABILITY AND THEIR CLASSIFICATION

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The article is dedicated to the blessed memory of the hrv method and the cybernetic model of dual-circuit regulation of cardiac activity author Roman Markovich Baevsky (August 3, 1928 - May 31, 2020.)

The article is devoted to the study of electromagnetic phenomena of human cardiac activity and the possibilities of their clinical use in practical medicine to assess the level of health in order to prevent NCDs. The results of a dynamic analysis of the spectral parameters of cardiac activity during the performance of an orthostatic test by functionally healthy people are given in the article. The authors described four functional types of mobilization/adaptation, gave a characterization and interpretation to them, proposed a variant of their classification based on the cybernetic model of dual-circuit regulation of cardiac activity R.M. Baevsky.

Key words: heart rate variability, spectral analysis.

The work is a fragment of the research project "Development of algorithms and technology for introducing a healthy lifestyle in patients with non-communicable diseases based on the study of psycho-emotional status", state registration No. 0116U007798.

Studying the processes of mobilization/adaptation, signaling continues to be one of the fundamental areas of systems biology and systems medicine. Adaptation provides daily adaptation to the action of the external environment and is of key etiological importance in the etiopathogenesis of non-communicable diseases (NCDs). Electromagnetic phenomena play a fundamental role in the functioning of the human body, and they should continue to be studied to further solve the global problem of NCDs.

The electromagnetic phenomena of cardiac activity can and should be considered as a sensitive indicator of the adaptive reactions of the whole organism because they have great prognostic and diagnostic

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