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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректур авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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STUDY OF THE PROCESSES OF LIPID PEROXIDATION, THE STATE OF THE ANTIOXIDANT SYSTEM IN PATIENTS WITH POLYTRAUMA AND ALCOHOL ANAMNESIS

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Abstract.

Background: The effectiveness of management of patients with severe combined trauma and alcohol withdrawal syndrome, complicated alcoholic delirium remains relevant and modern in intensive care. Sedation is the mainstay of treatment in patients with alcohol withdrawal complicated by alcohol delirium. Choosing the optimal scheme of treatment tactics, considering sedation, in victims with polytrauma becomes a difficult task due to a diverse combination of injuries and a lack of time for tactical decisions of patient management. Given the fact that polytrauma is characterized by pronounced oxidative stress, the development of hypoxia, especially when combined with chronic alcoholism, the expressiveness of biochemical disorders deepens significantly, the study of the course of biochemical processes and their mutual influence and the formation of current tactics of intensive therapy for these diseases is promising.

Purpose: Study of lipid peroxidation processes and the state of the antioxidant system in patients with polytrauma and alcohol withdrawal syndrome complicated by alcoholic delirium.

Materials and methods: The study was conducted on the basis of the Department of Anesthesiology and Intensive Care with 12 beds for patients with combined trauma of the communal non-profit enterprise "Kharkiv City Clinical Hospital of Rapid and Emergency Medical Care named after Professor O.I. Meschaninov". To achieve the goal of the study, 40 patients with polytrauma were examined (thoracic and/or abdominal trauma: rib fractures, hemothorax, pneumothorax, hematomas of the liver or spleen, fractures of the waist and/or upper and/or lower limbs, pelvic fractures), medium severity. During the study, to achieve the goal, the main indicators of the oxidant-antioxidant system in patients were determined. We determined the content of the main indicators of the oxidant system: active products of thiobarbituric acid, diene conjugates, 8-isoprostane to assess the intensity of lipid peroxidation. The state of the antioxidant system was assessed by the content of superoxide dismutase, catalase, and glutathione peroxidase. The study was conducted on the 1st and 7th day of hospitalization of the patients.

Results and discussion: The main indicators of the intensity of lipid peroxidation in the human body are diene conjugates and active products of thiobarbituric acid. This provides an autocatalytic self-accelerating character. The obtained results indicate that in patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium against the background of chronic alcoholism due to the generation of reactive oxygen species, which is evidenced by an increase in the content of active products of thiobarbituric acid, diene conjugates, 8-isoprostane, against the background of insufficient antioxidant the system can develop oxidative stress, which

is accompanied by damage to biological molecules: lipids, proteins, nucleic acids. Thus, the obtained results indicate an increase in the intensity of free radical reactions and processes of lipid peroxidation. Changes in the content of lipid peroxidation parameters in the blood of patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium, indicate more pronounced violations of the integral redox state. Activation of lipid peroxidation processes leads to a violation of the elasticity and mechanical integrity of cell membranes, a decrease in the activity of lipid-dependent membrane-bound enzymes. In a complex analysis of the content of biochemical markers of lipid peroxidation, namely active products of thiobarbituric acid, diene conjugates and 8-isoprostane in the blood of patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium, it was found that distinct processes are observed upon admission to the intensive care unit lipid peroxidation and free radical processes. Against the background of increased activity of the oxidant system, a decrease in antioxidant resources was observed as a decrease in the content of superoxide dismutase, catalase, and glutathione peroxidase.

Conclusions: The work revealed the dynamics of the indicators of the antioxidant system in patients and is related, on the one hand, to the exhaustion of the body's compensatory capabilities under the conditions of the development of strong oxidative stress, and on the other hand, it was probably a consequence of the negative impact of the products of chronic endogenous intoxication, alcohol, acetaldehyde on hepatocytes, where detoxification processes occur in the body of patients with chronic alcoholism and alcohol withdrawal syndrome. During the study, a significant suppression of the activity of all studied enzymes was found in patients with polytrauma, complicated by alcoholic delirium during admission to the intensive care unit, and on the seventh day after the therapy. Superoxide dismutase is part of the first link of antioxidant protection. This enzyme forms hydrogen peroxide from superoxide anions, which is further transformed into oxygen and water under the action of catalase. Considering the leading role of the activation of pro-oxidant processes in chronic alcoholism, indicators of the antioxidant-pro-oxidant status can be used to predict the course of this pathology, as well as the effectiveness of the selected treatment tactics for patients in this category.

Key words. Polytrauma, alcohol withdrawal syndrome, alcoholic delirium, oxidant shock, antioxidant system, sedation, dexmedetomidine.

Connection with scientific programs, plans and topics.

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Introduction.

Traumatic injury is a significant problem and cause of death and disability worldwide. The main mechanism of traumatic injuries is traffic accidents (70%) with a significant frequency of complications (80%) [1,2]. Alcohol is one of the main causes of traffic accidents. Despite the increased punishment for driving vehicles while intoxicated, the role of alcohol in the occurrence of traffic accidents in Ukraine remains significant [3].

Today, the effective treatment of patients with severe combined trauma remains an urgent problem of the health care system. Among victims with polytrauma, 15-20% regularly drink alcohol, about 5% suffer from chronic alcoholism. The lethality in polytrauma reaches 36%, of which 50% - 60% of victims die at the pre-hospital stage [4-9]. The most pronounced manifestation of alcohol withdrawal syndrome is alcoholic delirium [10]. Data from the World Health Organization and information from Ukrainian specialists share the fact that chronic alcohol abuse is a problem among people of working age, which affects changes in the functional state of the body [11-13].

The authors determined that the prevalence of pro-oxidant factors leads to the development of oxidative stress. In patients with polytrauma, oxidative stress has a two-wave nature: it is triggered at the time of traumatic injury and after the injury. Secondary oxidative damage can be formed by the development of a hyperinflammatory state [14,15].

A few scientific sources have information on probable changes in the activity of antioxidant systems depending on the period of study. Over time, their activity decreases due to the exhaustion of compensatory capabilities of the body, which is accompanied by a shift in the antioxidant-prooxidant balance towards the activation of free radical processes [16,17].

It is known that with polytrauma, the greatest number of complications develops precisely in the early period of the traumatic disease, which is associated with shock, intoxication, and hypoxia [18]. It is known that chronic alcoholism is accompanied by depletion of the glutathione antioxidant system, and experimental studies have confirmed a decrease in catalase activity [19,20,21].

According to the literature, polytrauma is characterized by pronounced oxidative stress, the development of hypoxia. In cases of a combination of polytrauma and chronic alcoholism, the expressiveness of biochemical disorders significantly deepens [22]. Also, with chronic alcoholism, there is also a violation of tissue trophism, the development of hypoxia, in patients with a combination of polytrauma and alcoholism, these changes will be even more pronounced [23,24].

Choosing the optimal scheme of treatment tactics for victims with polytrauma becomes a difficult task due to a diverse combination of injuries and lack of time for decision-making

[25]. Specialists in the intensive therapy of polytrauma distinguish several concepts, namely: "golden hour" and "damage control" [26-28]. Sedation is the mainstay of treatment in patients with alcohol withdrawal complicated by alcohol delirium. Supportive measures include stabilization and treatment of concomitant pathologies, detoxification therapy and full nutritional support [29].

In most cases, alcohol withdrawal syndrome is better managed with the use of a symptom-based protocol, as it leads to the introduction of lower doses of drugs, shorter duration of treatment and reduces the risk of excessive sedation of the patient [30]. Several patients may be refractory to benzodiazepine therapy, and increasing doses of benzodiazepines may lead to respiratory depression and complications. Modern studies have proven the effectiveness of centrally acting alpha-2 agonists, such as clonidine and dexmedetomidine. The authors established that the use of dexmedetomidine as monosedation of delirium tremens is promising but requires additional research [31,32].

Purpose.

Study of lipid peroxidation processes and the state of the antioxidant system in patients with polytrauma and alcohol withdrawal syndrome complicated by alcoholic delirium.

Materials and methods.

In the work, a study of 40 patients with polytrauma of moderate severity (thoracic and/or abdominal skeletal trauma: rib fractures, hemothorax, pneumothorax, hematomas of the liver or spleen, fracture of the bones of the waist and/or upper and/or lower limbs, fracture of the pelvis). The patients had an alcohol history with alcohol withdrawal syndrome complicated by alcoholic delirium. They received intensive therapy in the department of anesthesiology and intensive therapy with 12 beds for patients with combined trauma of the communal non-profit enterprise "Kharkiv City Clinical Hospital of Urgent Medical Care named after Prof. O.I. Meschaninov", which is the clinical base of the Department of Emergency Medicine, Anesthesiology, and Intensive Care of the Kharkiv National Medical University. The control group is 20 practically healthy people of the appropriate age and sex.

Patient inclusion criteria: age from 19-60 years, presence of injuries in two or more anatomical and functional areas, degree of severity of traumatic damage according to the ISS scale 9 - 15 points (average severity), severity of the condition of the victims according to the APACHE II scale 7-14 points, the state of chronic alcohol intoxication, revealed by the number of points ≥ 7 in the modified "LeGo Grid" test, 3 or more positive answers in the "CAGE" questionnaire, established alcoholic delirium (arousal on the RASS scale $\geq +2$; hallucinations; convulsions and the presence of delirium on the scale CAM-ICU and psychiatrist consultations).

During the study, to achieve the goal, the main indicators of the oxidant-antioxidant system in patients were determined. We determined the content of the main indicators of the oxidant system: active products of thiobarbituric acid, diene conjugates, 8-isoprostane to assess the intensity of lipid peroxidation. The state of the antioxidant system was assessed by the content of superoxide dismutase, catalase, and glutathione peroxidase. The

study was conducted on the 1st and 7th day of hospitalization of the patients.

The content of active products of thiobarbituric acid in blood serum was determined by a spectrophotometric method based on the ability of malondialdehyde to form a colored complex in the reaction with thiobarbituric acid [33]. The content of diene conjugates in blood serum was determined by the spectrophotometric method of Z. Placer (1968) as modified by V.B. Gavrillov, and singing (1983) [34]. The content of 8-isoprostane in blood serum was determined in the reactions of peroxidation of arachidonic acid of cell membranes and determined by the ELISA method of kits "8-isoprostane ELISA" reagents of the company "US Biological" (USA). The content of superoxide dismutase was determined according to the principle of competitive enzyme immunoassay using the Human Superoxide Dismutase (SOD) ELISA Kit (USA). The content of glutathione peroxidase was determined according to the principle of sandwich enzyme-linked immunosorbent assay using the Human GPX1 (Glutathione Peroxidase 1) ELISA Kit (USA). The content of catalase was determined according to the principle of sandwich enzyme-linked immunosorbent assay using the Human Catalase (CAT) ELISA Kit test set. (USA). To determine the content of catalase, superoxide dismutase, and glutathione peroxidase, enzyme immunoassay STAT-FAX No. 303-4469 was used.

Methods of mathematical and statistical analysis of the obtained results. On the basis of the created database, a statistical analysis was carried out using a package of application programs for statistical data processing STATISTICA 7.0 for WINDOWS, (StatSoft Inc., USA) and MICROSOFT EXCEL 2010, intended for solving medical and biological problems. The mathematical processing of the obtained results was carried out in accordance with the generally accepted methodology of statistical analysis. Considering the nature of the distribution of the analyzed values, parametric (mean value, standard deviation) and non-parametric methods were used. The critical value of the level of significance (p) was taken to be $\leq 5\%$ ($p \leq 0.05$). To compare two samples with binary characteristics, the Pearson test or Fisher's exact test was used with the construction of correlation tables. The χ -square and odds ratio were used to assess the causal role of various factors in the development of lesions. To determine the presence and strength of the relationship between the

features, a correlation analysis was performed: determination of the Pearson linear coefficient (for parametric features) and Spearman's analysis (for non-parametric ones).

Results and discussion.

The main indicators of the intensity of lipid peroxidation in the human body are diene conjugates and active products of thiobarbituric acid. This provides an autocatalytic self-accelerating character. The results obtained by us are presented in the table.

Diene conjugates and active products of thiobarbituric acid are secondary and end products of lipid peroxidation, formed from hydroperoxides. The latter are a product of the interaction of polyunsaturated fatty acids, which are part of phospholipids, with active forms of oxygen. An increase in the content of diene conjugates and active products of thiobarbituric acid in the blood is a sign of the activation of lipid peroxidation processes. This leads to damage to the integrity of cell membranes and cell death [35]. Another marker of the development of oxidative stress is 8-isoprostane, which is a chemically stable, specific, early marker of the activation of lipid peroxidation and the development of oxidative stress [36].

During the study, it was established that patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium, are characterized by an increase in lipid peroxidation processes and the development of oxidative stress. This is evidenced by the increase in the serum content of the following parameters - active products of thiobarbituric acid by 2.21 times in patients admitted to the intensive care unit and diene conjugates by 1.92 times when admitted to the intensive care unit ($p < 0.001$) and 8 -isoprostane - was higher by 1.93, ($p < 0.001$), compared to the indicators of the control group.

The content of active products of thiobarbituric acid in the blood of patients on the first day of admission to the intensive care unit significantly ($P < 0.0001$) exceeded these indicators in the blood of healthy individuals by 2.21 times. After a week, patients observed a decrease in the content of this indicator in the blood by 1.82 times ($P < 0.001$) compared to the time of admission to the department. The content of active products of thiobarbituric acid in the blood was almost equal to the values in the control group and was within the reference values. If we compare the blood content of this parameter of lipoperoxidation after treatment in the intensive care unit, significant positive changes

Table 1. Biochemical indicators of lipid peroxidation in blood serum of patients with polytrauma and alcohol withdrawal syndrome complicated by alcoholic delirium (Me [25%; 75%]).

Groups	active products of thiobarbituric acid, $\mu\text{mol/g}$ of protein	Diene conjugates, $\mu\text{mol/g}$ of protein	8-isoprostane, ng/ml
CONTROL (n=20)	3,14 [2,45; 3,75]	1,74 [1,31;1,97]	2,24 [2,06; 2,54]
Group, 1 day (n=40)	6,94 [5,85; 7,60] $p_1 < 0,0001$	3,34 [2,98;3,63] $p_1 < 0,001$	4,33 [3,78;4,93] $p_1 < 0,0001$
Group, 7 days (n=40)	3,82 [3,14; 5,63]# $p_1 < 0,0006$	2,66 [2,21; 3,16] $p_1 < 0,001$	3,17 [2,84; 3,97] $p_1 < 0,0001$

Note. $P1 < 0.0001$ - reliability of differences compared to indicators in the control group.

- $P < 0.0001$ - reliability of differences compared to 1 day in the group.

were determined in patients who received dexmedetomidine, compared to patients who were treated according to standard regimens.

Similar changes in the content of diene conjugates in the blood were determined in patients during admission to the intensive care unit: it was statistically significantly increased by 1.92 times compared to the content of this product of lipid peroxidation in the control group. A week after intensive therapy in patients, the content was statistically significantly reduced by 20.4%, but remained elevated by 1.53 times compared to the control. It should be noted that there was a significant difference between the content of diene conjugates in the blood on the seventh day of stay in the department compared to the first day in patients, and little positive dynamics.

During the study, it was established that patients have an increase in the concentration of 8-isoprostane in their blood. Analysis of the serum content of 8-isoprostane in the blood showed that it was 2.24 [2.06; 2.54] ng/ml. In the blood of patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium upon admission to the hospital, the content of 8-isoprostane in the blood was statistically significantly increased by 1.93 times. After a week of hospital stay, the content of 8-isoprostane in the blood decreased significantly - by 26.8% ($P < 0.0001$) in patients compared to this indicator at the time of admission to the department.

Simultaneously with the activation of free radical processes and the formation of oxidative stress, we noted a probable decrease in the indicators of the antioxidant status. It is known that enzyme antioxidants exhibit the most powerful protective properties in the body. The antioxidant status was assessed by determining the content of the main antioxidant enzymes - superoxide dismutase, catalase, and glutathione peroxidase.

According to research data, it was determined that the content of superoxide dismutase in the blood was reliably reduced by 42.8% during admission to the hospital compared to the control and was 1123 [987.7; 1309] pg/ml. After a week of stay in the intensive care unit, the content of superoxide dismutase in the blood of patients increased statistically significantly by 1.39 times ($P < 0.0001$) compared to this indicator during admission to the hospital and remained 1.25 times lower than this indicator in the blood of the control group and was 1568 [1438; 1833] pg/ml.

The content of catalase in the blood of healthy individuals was 9.9 [8.33; 11.25] pg/ml. In the blood of patients during admission to the department, a statistically significant decrease ($p < 0.0001$) in the content of this indicator of antioxidant protection was observed by 27%, and its content was 7.23 [6.42; 8.42] pg/ml.

A week after the use of dexmedetomidine, a significant statistically significant increase in the content of catalase in the blood of patients was observed by 26.3% in comparison with admission to the department and amounted to 9.13 [8.08; 10.20] pg/ml, which is only 7.7 % differed from the control ($p > 0.14$).

It is known that the enzyme glutathione peroxidase plays a major role in the inactivation of lipid hydroxyperoxides. Analysis of the content of glutathione peroxidase in the blood of patients during admission to the department showed that there was a statistically significant decrease in its content by

23.3% ($p < 0.0001$) compared to the control. A decrease in the content of glutathione peroxidase in the blood of patients may be associated with the depletion of compensatory reactions aimed at normalizing the processes of lipid peroxidation.

A week after the therapy, similar changes in other indicators of the antioxidant system are observed in the blood of patients, namely, an increase in the content of glutathione peroxidase by 23.2% ($p < 0.0001$) compared to the content of this indicator at the time of admission to the department and practically did not differ from control ($p = 0.2068$).

It is known from the scientific literature that the main function of glutathione peroxidase is to protect cells from the negative effects of xenobiotics, in particular alcohol and free radical oxidation products. Therefore, the reduction of glutathione peroxidase is associated, on the one hand, with the depletion of the body's antioxidant system, and on the other hand, with inhibition by alcohol breakdown products.

The obtained results indicate that in patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium against the background of chronic alcoholism due to the generation of reactive oxygen species, which is evidenced by an increase in the content of active products of thiobarbituric acid, diene conjugates, 8-isoprostane, against the background of insufficient antioxidant the system can develop oxidative stress, which is accompanied by damage to biological molecules: lipids, proteins, nucleic acids. Thus, the obtained results indicate an increase in the intensity of free radical reactions and processes of lipid peroxidation.

Changes in the content of lipid peroxidation parameters in the blood of patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium, indicate more pronounced violations of the integral redox state. Activation of lipid peroxidation processes leads to a violation of the elasticity and mechanical integrity of cell membranes, a decrease in the activity of lipid-dependent membrane-bound enzymes.

In a complex analysis of the content of biochemical markers of lipid peroxidation, namely active products of thiobarbituric acid, diene conjugates and 8-isoprostane in the blood of patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium, it was found that distinct processes are observed upon admission to the intensive care unit lipid peroxidation and free radical processes. Against the background of increased activity of the oxidant system, a decrease in antioxidant resources was observed, in particular, a decrease in the content of superoxide dismutase, catalase, and glutathione peroxidase.

A statistically significant increase in the content of 8-isoprostane in the blood of patients confirms the development of oxidative stress, since this substance is a metabolite of the polyunsaturated acid cascade, namely arachidonic acid. Its presence signals the powerful formation and release of highly reactive compounds that damage cellular and extracellular formations, biological molecules, etc. Under such conditions, the course of the pathological process is significantly aggravated and creates additional conditions for deepening the expressiveness of endogenous intoxication. As part of the study, it was found that more pronounced changes in the concentration

of 8-isoprostane in the blood were observed in patients with polytrauma and alcohol withdrawal syndrome, complicated by alcoholic delirium during hospitalization, which, in our opinion, is natural, considering the peculiarities of the pathogenesis of the pathology.

Conclusion.

The dynamics of the indicators of the antioxidant system in patients was revealed and is related, on the one hand, to the exhaustion of the compensatory capabilities of the body under the conditions of the development of strong oxidative stress, and on the other hand, it was probably a consequence of the negative impact of the products of chronic endogenous intoxication, alcohol, acetaldehyde on hepatocytes, where the processes take place detoxification in the body of patients with chronic alcoholism and alcohol withdrawal syndrome. The latter is confirmed by numerous data from the scientific literature regarding significant changes in not only biochemical but also morphological indicators of hepatocytes [37].

During the study, a significant suppression of the activity of all studied enzymes was found in patients with polytrauma, complicated by alcoholic delirium during admission to the intensive care unit, and on the seventh day after the therapy. Superoxide dismutase is part of the first link of antioxidant protection. This enzyme forms hydrogen peroxide from superoxide anions, which is further transformed into oxygen and water under the action of catalase.

Considering the leading role of the activation of pro-oxidant processes in chronic alcoholism, indicators of the antioxidant-pro-oxidant status can be used to predict the course of this pathology, as well as the effectiveness of the selected treatment tactics for patients in this category.

Prospects for further research.

Further study of the relationship between the main markers of pathogenetic processes and, as a result, characteristic biochemical disorders affecting the condition of patients with polytrauma and alcohol history. It is promising to study the course of combined traumatic illness in patients with chronic alcoholism and alcohol withdrawal syndrome, complicated by alcoholic delirium at all stages of the intensive care protocol of each patient to achieve quality of life.

Conflict of interest.

The authors of the manuscript knowingly acknowledge the absence of actual or potential conflict of interest regarding the results of this work with pharmaceutical companies, manufacturers of biomedical devices, other organizations whose products, services, financial support may be related to the subject matter or sponsored.

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REFERENCES

1. Guidelines for essential trauma care. World Health Organization, International Society of Surgery/Société

Internationale de Chirurgie and the International Association for the Surgery of Trauma and Surgical Intensive Care (IATSIC).

2. Prevention WH. Global status report on road safety 2013: Supporting a decade of action. Geneva, Switzerland: World Health Organization. 2013.

3. Shchorichna dopovid pro stan zdorovia naseleennia, sanitarno-epidemichnu sytuatsiiu tarezultaty diialnosti systemy okhorony zdorovia Ukrainy. 2017 rik, MOZ Ukrainy, DU «UISD MOZ Ukrainy». – Kyiv : MVTs «Medinform», 2018.

4. Balogh ZJ. Polytrauma: It is a disease. *Injury*. 2022;53:1727-1729.

5. Bentley M, Ah Yen D, Smith A, Christey G. Blood alcohol screening and outcomes in trauma team activation patients at a level 1 trauma center in New Zealand. *Emerg Med Australis*. 2021;33:1036-1043.

6. Butcher NE, Enninghorst N, Sisak K, et al. The definition of polytrauma: variable interrater versus intrarater agreement- a prospective international study among trauma surgeons. *J Trauma Acute Care Surg*. 2013;74:884-889.

7. Erdogan M, Kureshi N, Karim SA, et al. Retrospective analysis of alcohol testing in trauma team activation patients at a Canadian tertiary trauma center. *BMJ Open*. 2018;8:e024190.

8. Ofitsiinyi vebportal parlamentu Ukrainy. Pro zatverdzhennia ta vprovadzhennia medyko-tekhnologichnykh dokumentiv zi standartyzatsii ekstrenoi medychnoi dopomohy; 2019.

9. Pfeifer R, Teuben M, Andruszkow H, et al. Mortality patterns in patients with multiple trauma: a systematic review of autopsy studies. *Plos One*. 12 liut. 2016;11:e0148844.

10. Day E, Daly C. Clinical management of alcohol withdrawal syndrome. *Addiction*. 2022;117:804-814.

11. Coutinho IG, Crema TH, Petta BF, et al. Retrospective study of polytrauma patients medical records that presented abdominal trauma, compared to abdominal trauma and extra-abdominal injuries. *Acta Scientiarum. Health Sciences*. 2021;43:e56944.

12. Halvachizadeh S, Baradaran L, Cinelli P, et al. How to detect a polytrauma patient at risk of complications: A validation and database analysis of four published scales. *PLoS One*. 2020;15:e0228082.

13. van Breugel JMM, Niemeyer MJS, Houwert RM, et al. Global changes in mortality rates in polytrauma patients admitted to the ICU- a systematic review. *World J Emerg Surg*. 2020;15:55.

14. Bedreag OH, Sandesc D, Chiriac SD, et al. The Use of Circulating miRNAs as Biomarkers for Oxidative Stress in Critically Ill Polytrauma Patients. *Clin Lab*. 2016;62:263-274.

15. Erkekoğlu P, Aşçı A, Ceyhan M, et al. Selenium levels, selenoenzyme activities and oxidant/antioxidant parameters in H1N1-infected children. *Turk J Pediatr*. 2013;55:271-282.

16. Mukharjee Suchismita, Maiti Smarajit. Adverse Effects of Chronic Alcohol Consumption. *SN Comprehensive Clinical Medicine*. 2020;3:308-315.

17. Sogut I, Paltun SO, Tuncdemir M, et al. The antioxidant and antiapoptotic effect of boric acid on hepatotoxicity in chronic alcohol-fed rats. *Can J Physiol Pharmacol*. 2018;96:404-411.

18. Miyamoto K, Nakashima T, Shima N, et al. Effect of Dexmedetomidine on Lactate Clearance in Patients with Septic

Shock: A Subanalysis of a Multicenter Randomized Controlled Trial. Shock. 2018;50:162-166.

19. Ghezzi, Pietro, et al. Cysteine/Glutathione Deficiency: A Significant and Treatable Corollary of Disease. The Therapeutic Use of N-Acetylcysteine (NAC) in Medicine. Adis, Singapore. 2019:349-386.

20. Gotz ME, Janetzky B, Pohli S, et al. Chronic alcohol consumption and cerebral indices of oxidative stress: is there a link? Alcoholism: Clinical and Experimental Research. Trav. 2001;25:717-725.

21. Land, Walter Gottlieb. Damage-Associated Molecular Patterns in Human Diseases: Volume 2: Danger Signals as Diagnostics, Prognostics, and Therapeutic Targets. Springer Nature, 2020.

22. Bershadsky FF, Grebenchikov OA, Yershov AV, et al. Influence of Sedation with Dexmedetomidine on Oxidative Distress During Delirium Developed Following Severe Polytrauma. General Reanimatology. 2019;15:11-20.

23. Hernández G, Tapia P, Alegría L, et al. Effects of dexmedetomidine and esmolol on systemic hemodynamics and exogenous lactate clearance in early experimental septic shock. Crit Care. 2016;20:234.

24. van Wessem KJP, Leenen LPH. Is chest imaging relevant in diagnosing acute respiratory distress syndrome in polytrauma patients? A population-based cohort study. Eur J Trauma Emerg Surg. 2020;46:1393-1402.

25. Aldrian S, Wernhart S, Negrin L, et al. Epidemiological and economic aspects of polytrauma management in Austria. Wiener klinische Wochenschrift. 5 hrud. 2011;124:78-84.

26. Barry AE, Chaney BH, Stellefson ML, et al. Validating the ability of a single item assessing drunkenness to detect hazardous drinking. The American Journal of Drug and Alcohol Abuse. 9 lyp. 2013;39:320-325.

27. Khyzhniak AA, Dubivska SS. ta Veklych I.A. red. Politravma: metodychni vkazivky zi spetsialnosti "Medytsyna nevidkladnykh staniv" dlia pidhotovky likarivinterniv, slukhachiv peredatestatsiinykh tsykliv. Kharkiv: KhNMU; 2014. 28 s.

28. Stratehiya «Damage control». A.V. Kostroi, P.V. Polenok. Tavrycheskyi medyko-byolohycheskyi vestnyk. 2011;14:89-92.

29. Long D, Long B, Koefman A. The emergency medicine management of severe alcohol withdrawal. Am J Emerg Med. 2017;35:1005-1011.

30. Rahman A, Paul M. Delirium Tremens. 2022 Aug 22. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2022 Jan. PMID: 29489272.

31. Abdulmajeed F, Carpenter M, Boutros N. Dexmedetomidine (DEX) as a monotherapy in treating delirium tremens (dts). Chest. Zhovt. 2013;144:367A.

32. Gerresheim G, Brederlau J, Schwemmer U. Dexmedetomidine in the treatment of acute alcohol withdrawal delirium. Anaesthesist. 2016;65:525-531.

33. Fedorova TM, Korshunova TS, Larskyi EH. Reaktsiia s tyobarbuturovoiu kyslotoi dlia opredeleniia MDA krovu metodom fotometry. Laboratornoe delo.1983;3:25-28.

34. Havrylov VB, Myshkorudnaia MY. Spektrofotometrycheskoe

opredeleniye soderzhaniya hydroperekyssei lypydov v plazme krovu. Lab. delo. 1983;3:33-35.

35. Yhnatenko VA, Lsenkova AV, Kalynyn AL, et al. TBK-aktyvnye produkty perekysnoho okysleniia lypydov erytrotsytoy v UZ-pole y pry nalychyu etanola. Problemy zdorovia y ekolohyy. 2012;4:117-122.

36. Barry Halliwell, Chung Yung J. Lee. Using Isoprostanes as Biomarkers of Oxidative stress: Some Rarely Considered Issues. Antioxidants & Redox Signaling. 2010;13:145-156.

37. Vlasov AP, Kamkina OV, Trofimov VA, et al. Metabolic Restructuring in the Liver under Conditions of Endogenous Intoxication. Bull Exp Biol Med. 2017;163:317-320.

Резюме

Актуальність. Ефективність ведення пацієнтів із важкою поєднаною травмою та синдромом відміни алкоголю, ускладненим алкогольним делірієм залишається актуальним та сучасним в інтенсивній терапії. Седация становить базову терапію у пацієнтів зі станом відміни алкоголю, ускладненим алкогольним делірієм. Вибір оптимальної схеми лікувальної тактики, з урахуванням седатії, у потерпілих з політравмою стає складним завданням внаслідок різноманітного поєднання пошкоджень та дефіциту часу для тактичних рішень ведення пацієнтів. Зважаючи на те, що політравма характеризується виразним окисним стресом, розвитком гіпоксії, особливо при поєднанні з хронічного алкоголізму, виразність біохімічних порушень значно поглиблюється, дослідження перебігу біохімічних процесів та їх взаємовплив та формування актуальної тактики інтенсивної терапії при цих захворюваннях, є перспективним.

Мета роботи – вивчення процесів ліпідної пероксидації та стану антиоксидантної системи у пацієнтів з політравмою та синдромом відміни алкоголю, ускладненим алкогольним делірієм.

Матеріали та методи. Дослідження було проведено на базі відділення анестезіології та інтенсивної терапії на 12 ліжок для хворих з поєднаною травмою комунального некомерційного підприємства «Харківська міська клінічна лікарня швидкої та невідкладної медичної допомоги імені професора О.І. Мещанінова». Для досягнення мети дослідження було обстежено 40 пацієнтів з політравмою (торако- і/або абдоміноскелетна травма: переломи ребер, гемо-, пневмоторакс, гематоми печінки або селезінки, перелом кісток поясу, і/або верхніх і/або нижніх кінцівок, перлом кісток тазу), середньої тяжкості. У ході проведення дослідження, для досягнення мети, визначали основні показники оксидантно - антиоксидантної системи у пацієнтів. Визначали вміст основних показників оксидантної системи: активних продуктів тіобарбітурової кислоти, дієнових кон'югатів, 8-ізопростану для оцінки інтенсивності перекисного окислення ліпідів. Стан антиоксидантної системи оцінювали за вмістом супероксиддисмутази, каталази, глутатіонпероксидази. Дослідження проводили на 1 та 7 добу госпіталізації пацієнтів.

Результати та їх обговорення. Основними показниками

інтенсивності перекисного окиснення ліпідів в організмі людини є дієнові кон'югати і активні продукти тіобарбітурової кислоти. Це забезпечує аутокаталітичний самоприскорюючий характер. Отримані результати вказують, що у хворих з політравмою та синдромом відміни алкоголю, ускладненим алкогольним делірієм на тлі хронічного алкоголізму внаслідок генерації активних форм кисню, про що свідчить підвищення вмісту активних продуктів тіобарбітурової кислоти, дієнових кон'югатів, 8-ізопростану, на фоні недостатності антиоксидантної системи може розвиватися оксидативний стрес, який супроводжується пошкодженням біологічних молекул: ліпідів, білків, нуклеїнових кислот. Таким чином, одержані результати свідчать про посилення інтенсивності вільнорадикальних реакцій та процесів перекисного окиснення ліпідів.

Зміни вмісту в крові пацієнтів з політравмою та синдромом відміни алкоголю, ускладненим алкогольним делірієм параметрів ліпідної пероксидації вказують на більш виразні порушення інтегрального редокс-стану. Активація процесів перекисного окиснення ліпідів призводить до порушення еластичності, механічної цілісності клітинних мембран, зниження активності ліпідозалежних мембранозв'язаних ферментів.

При комплексному аналізі вмісту біохімічних маркерів ліпідної пероксидації, а саме активних продуктів тіобарбітурової кислоти, дієнових кон'югатів та 8-ізопростану в крові пацієнтів з політравмою та синдромом відміни алкоголю, ускладненим алкогольним делірієм було виявлено, що при надходженні до відділення інтенсивної терапії спостерігаються виразні процеси перекисного окиснення ліпідів та вільно-радикальні процеси.

На тлі підвищення активності оксидантної системи спостерігали зменшення антиоксидантних ресурсів, зокрема зниженні вмісту супероксиддисмутази, каталази, глутатіонпероксидази.

Висновки. В роботі виявлена динаміка показників антиоксидантної системи у пацієнтів та пов'язана з одного боку із виснаженням компенсаторних можливостей організму за умов розвитку потужного оксидативного стресу, а з іншого – ймовірно, було наслідком негативного впливу продуктів хронічної ендогенної інтоксикації, алкоголю, ацетальдегіду на гепатоцити, де відбуваються процеси детоксикації в організмі хворих з хронічним алкоголізмом та синдромом відміни алкоголю.

В ході дослідження було виявлено достовірне пригнічення активності всіх досліджуваних ензимів, у пацієнтів із політравмою, ускладненим алкогольним делірієм під час потрапляння до відділення інтенсивної терапії, та на сьому добу після проведеної терапії. Супероксиддисмутаза входить до складу першої ланки антиоксидантного захисту. Цей фермент з супероксидних аніонів утворює перекис водню, що далі за дією каталази перетворюється на кисень та воду.

Беручи до уваги провідну роль активації прооксидантних процесів за хронічного алкоголізму, показники антиоксидантно - прооксидантного статусу можуть використовуватись для прогнозування перебігу даної патології, а також ефективності обраної тактики лікування пацієнтів даної категорії.

Ключові слова: політравма, синдромом відміни алкоголю, алкогольний делірій, оксидантний стрес, антиоксидантна система, седація, дексмететомідин.