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Review article

Bedsore. Prevention and treatment (Theoretical literature review)

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Abstract

The incidence of bedsores varies from 3 to 40%, with a maximum of 80% in patients in critical condition for a long time. The purpose of this review is to analyze the range of methods of decubitus therapy, which have been shown to be effective in conservative treatment. The objectives of the study included: a) analysis of available literature sources; b) identification of effective methods of decubitus therapy; c) analysis of methods of prevention of bedsores.

Thirty-one scientific publications from PubMed, Scopus databases since 2020 were analyzed. The analyzed methods included vacuum therapy, ultrasound methods, hydrosurgery, plasma flow method, laser application, electrostimulation, and a complex combination of methods. Many involved methods give the choice in therapy strategy. The most expedient and effective is the complex combination of methods.

Conclusions. Currently, a decrease in the incidence of bedsores is not expected; therefore, the analysis of the effectiveness of methods of therapy and prevention of bedsores remains relevant.

Keywords: bedsores, surgery, physical methods, complex combination, prevention, therapy.

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Introduction

Bedsore is a current and pressing problem in modern medicine, associated with the hospitalization of sedentary or immobile patients. They occur in patients with a severe comorbid background, as well as in patients diagnosed with spinal trauma and cerebral accidents. In the European Union, the incidence of bedsores varies and ranges from 3% to 40% but can be as high as 80% for severe traumatic brain injury. For the United States, the numbers are 2 to 18%. Every year, the treatment of bedsores in the U.S. alone costs between \$9 and \$11 billion [1]. The death rate from bedsores is 60,000 patients per year, as complications such as sepsis and osteomyelitis occur as a result. Bedsores can be foci of primary infection, which can result in a 60% higher mortality rate compared to the general population [2]. In this regard, the Pressure Ulcers Prevention Program was developed and implemented, which has reduced the number of bedsores by half [3].

Risk factors for pressure ulcers include immobility, constant pressure, which is higher than in small vessels, the friction that resists movement, obesity or vice versa, emaciation, lack of fluids and inadequate nutrition, diabetes, cardiovascular disease. Additional factors can be fecal or urinary incontinence, high levels of sweating, poor hygiene, and allergies to products used to care for the patient [4]. Bedsores can be caused by foreign objects in the bed, such as food debris, stitches, or buttons. In immobilized patients, excluding the causes of bedsores is difficult because it is almost impossible to prevent high pressure on the covering tissues, or elimination of the patient's body and its high moisture content in the skin [5]. Severe course of the underlying pathology results in body exhaustion, anemia, as well as pulmonary diseases (pneumonia), protein, and carbohydrate deficiency.

Methodology

The object of the study was methods of physical therapy and prevention of bedsores. To identify effective methods of prevention and therapy of bedsores, a search of such databases as PubMed, Scopus was

Main part

Prevention. Methods of prevention include examination of the patient 6 hours after admission to the intensive care unit or ICU. The condition of the skin is evaluated by palpation in the areas where the skin protrusions are located. A thorough documentation of skin lesions, if any, is made, and such indicators as skin turgor, temperature, and texture, as well as its color, are taken into account [10]. Additionally, the presence of erythema, if the skin is light, or discoloration, if the skin is dark, is taken into account. Indicators such as discharge, thickening, swelling, rash, soreness, or itching are taken into account [11]. In order to predict possible risks, the Braden scale, developed to assess patients with bedsores, is used. If bedsores fall into categories 1-2, conservative therapy (A) is used, and 70% of the healing is achieved. If the pressure sores fall into categories 3-4, they are treated surgically (A). In this case, the nutritional status and wound decontamination are improved [12]. In the case of fecal or urine infiltration (urethral fistula), a colostomy or a cystostomy is applied, respectively. Infection is controlled by monitoring and application of antiseptics or antibiotics [13]. If the quality of life is not expected to improve, or if the patient and his relatives do not perform preventive measures, surgical reconstruction of bedsores is not recommended. It is known that the effectiveness of

These processes can occur over many months, due to the fact that macroscopic changes are heterogeneous, on examination, it is possible to identify both necrotic and granulation areas of the skin. If surgical intervention is not possible, specialists mainly use long-term conservative therapy [6]. In addition to preventive measures, such as correct positioning of the patient in bed to reduce pressure on the skin, surgical techniques such as sanitation and drainage of the infective focus, as well as the removal of necrotic areas may be used [7].

In modern medicine, physical methods, as well as wound coverings and various pharmacologically active substances are used in the fight against bedsores. Their common goal is wound healing [8]. The effectiveness depends directly on the size of the decubitus, although some evidence suggests that with the right strategy, it is possible to treat 3rd-4th degree decubitus in a period of 4 to 6 weeks [9].

There are a lot of studies devoted to pressure sores, but they mainly concern the effectiveness of single methods, prevention of pressure sores, and their relationship with various underlying diseases [1,3,10]. It is necessary to analyze the whole range of modern methods of prevention and therapy of bedsores, which determined the relevance of the research.

The purpose of this review is to analyze the range of methods of decubitus therapy, which have been shown to be effective in conservative treatment. The objectives of the study included: a) analysis of available literature sources; b) identification of effective methods of decubitus therapy; c) analysis of methods of prevention of bedsores.

used. Publications since 2020 were used. As a result, 31 publications were selected, in which modern methods of prevention and therapy of bedsores were covered in detail.

therapy can increase with the use of physical methods: vacuum, electrostimulation, and others [14]. Nutritional supplements such as vitamin C, selenium, and mineral elements do not contribute to the healing processes. However, preventive use of anti-sore mattresses reduces their incidence compared to standard beds in hospitals [12].

Therapy methods. Since 2015, the American College of Physical Therapists has regularly updated recommendations for the prevention and therapy of bedsores. When bedsores develop, it is necessary to use anti-decubitus mattresses, solutions, dressings, as well as ultrasound techniques, ultraviolet-emitting lamps, feeding regimen, and choice of adequate therapy [15]. The choice of therapy takes into account such causes as the stage of bedsores, as well as the target of therapy. An algorithm is used to determine the management of bedsores. Protein and fluid C doses are prescribed for patients. If necessary, patients are prescribed vitamins and micronutrients [16].

The application of physical methods of bedsores therapy is a separate direction of conservative therapy. It is allowed to use one method alone or as a part of complex therapy, the purpose of which is cleaning of tissue debris, pus, and fibrin [17]. Additionally, regenerative processes are stimulated [18].

Vacuum therapy of bedsores is currently one of the most common methods of treatment. The essence of the method consists in creating a negative pressure area on the surface of the decubitus [19]. It achieves wound surface clearing from infection and necrosis, pH returns to normal values, exudative processes, and edema reduction to controllable values [20]. Besides, the processes of tissue granularization begin, the degree of inflammation decreases. This method has shown its effectiveness in the treatment of bedsores (decubitus, necrosis) [21]. When there is a high degree of contamination, this method is indicated, for example, in the case of fecal mass penetration [22].

Another effective method is therapy with ultrasound. In the process of wave action, the damaged areas are destroyed, but their temperature does not increase significantly. In the treatment of bedsores, two methods of ultrasound application are the most popular: ultrasonic knife and cavitation [23]. The latter method is used when it is necessary to destroy tissues with a large amount of accumulated fluid. The hydrosurgery method is also quite popular, with the help of which it becomes possible to remove microflora, necrotic foci, but the adjacent tissues are preserved [23].

The use of thermal energy is associated with the use of two methods, laser, and plasma therapy. Therapy with plasma flows has become a very common

Conclusion

Based on the results of the examination, we can conclude that there is no definitive solution to the problem of bedsores yet. Moreover, the reduction of bedsores among patients will not occur in the near future due to the forced immobility of patients with severe pathologies or injuries. Therefore, a positive result can only be possible with adequate therapy of the underlying pathology and attentive care of patients deprived of the ability to move. At the same time, it is necessary to approach the choice of local methods on bedsores in the right way, that is, their therapy. The methods considered are quite varied,

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treatment for bedsores in the last two decades. With this method, necrotic areas can be dissected without blood loss, hemostasis is accomplished at the proper level since the surface is treated with high energy. In addition, the wound surface is sterilized because ultraviolet light and a high concentration of ozone is observed [24]. A newer technology is the use of lasers. Two modes are used - surgery mode and therapy mode. YAG-Ho- as well as CO₂-, YAG-Nd- lasers, have received good recommendations when dealing with pus removal [25]. Another technology, low-energy lasers, is often used in the local treatment of bedsores [26].

In addition to physical ones, methods related to the enhancement of regeneration processes are widely used. More often these methods are used in the case of stage 2 diagnosis of bedsores [27]. These therapy methods include ozone, oxygenation, exposure to electricity, magnetic therapy, and the method of photodynamics [28]. A combination of phonophoresis and antiseptics, the effect of ultraviolet light on the areas adjacent to the erythema, and a combination of electrophoresis and antimicrobial drugs are also used. In some cases, bedsores are treated with a pulsatile jet [27].

Methods involving a combination of the above therapies are the most common. Most specialists recognize that monotherapy is ineffective in the long term [29, 30]. In this regard, combinations seem to be more justified. As a rule, these are combinations of ultrasound, vacuum, and hydrosurgical therapy, which have justified themselves in the treatment of bedsores of 3-4 degrees. Vacuum therapy proved to be less effective vs. its combination with wound coverings and preparations [30].

which makes it easier to make an adequate choice in an individualized approach to the treatment of a patient from bedsores. However, each method of decubitus therapy has its own limitations, contraindications. There are not always a sufficient number of studies that convincingly prove the clinical efficacy of a therapy method. In this regard, further research on methods of therapy and prevention of bedsores is relevant in modern medicine.

Conflict of interest. There is no conflict of interest.

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Төсек жаралары. Алдын алу және емдеу (Әдебиеттерге теориялық шолу)

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Түйіндемe

Төсек жараларының кездесу жиілігі 3%-дан 40%-ға дейін ауытқиды, сондай-ақ ұзақ уақыт бойы ауыр жағдайда болған науқастарда 80% құрайды. Бұл шолудың мақсаты консервативті емдеуде тиімді екендігі көрсетілген терапиясының әдістерінің спектрін талдау болып табылады. Зерттеудің міндеттері мыналарды қамтиды: а) қолжетімді әдебиет көздерін талдау; б) декубит терапиясының тиімділігін саралау; в) төсек жараларының алдын алу әдістерін талдау.

PubMed, Scopus дерекқорларда қолжетімді 2020 жылдан бері жарық көрген отыз бір ғылыми жарияланым талданды. Талданған әдістерге вакуумдық терапия, ультрадыбыстық әдістер, гидрохирургия, плазмалық ағын әдісі, лазерлік қолдану, электростимуляция және аталмыш әдістердің күрделі комбинациясы кірді.

Емдеуге кірістірілген көптеген әдістер жалпы терапия стратегиясын таңдап, анықтауға мүмкіндік береді. Емдеу стратегиясының ең орынды және тиімдісі - әдістердің күрделі комбинациясы. Қазіргі уақытта төсек жараларының төмендеуі күтілмейді. Сондықтан төсек жараларының терапиясы мен алдын алу әдістерінің тиімділігін талдау өзекті болып қала береді.

Түйін сөздер: төсек жаралары, хирургия, физикалық әдістер, кешенді комбинация, алдын алу, емдеу.

Пролежни. Профилактика и лечение (Теоретический обзор литературы)

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Резюме

Частота пролежней колеблется от 3 до 40%, максимум 80% у больных, находящихся в критическом состоянии в течение длительного времени. Целью данного обзора является анализ спектра методов пролежневой терапии, показавших свою эффективность при консервативном лечении. В наши задачи исследования входило: а) анализ доступных литературных источников; б) определение эффективных методов лечения пролежней; в) анализ методов профилактики пролежней.

Проанализирована 31 научная статья, опубликованная с 2020 года. Нами для проведения поиска литературы были использованы базы данных PubMed, Scopus. Анализируемые методы включали вакуумную терапию, ультразвуковые методы, гидрохирургию, плазменный метод, лазерную аппликацию, электростимуляцию и сложную комбинацию методов.

Многие задействованные методы позволяют определить стратегию терапии. Наиболее действенным и эффективным является комплексное сочетание методов. В настоящее время снижения заболеваемости пролежнями не ожидается. Поэтому анализ эффективности методов терапии и профилактики пролежней остается актуальным.

Ключевые слова: пролежни, хирургия, физические методы, комплексное сочетание, профилактика, терапия.