

МІНІСТЕРСТВО ОСВІТИ ТА НАУКИ УКРАЇНИ
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ
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ПЕРСПЕКТИВИ РОЗВИТКУ МЕДИЧНОЇ НАУКИ І ОСВІТИ

ЗБІРНИК ТЕЗ ДОПОВІДЕЙ
ВСЕУКРАЇНСЬКОЇ НАУКОВО-МЕТОДИЧНОЇ КОНФЕРЕНЦІЇ,
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Матеріали та методи дослідження. У роботі використано букальний епітелій 116 хворих з хронічним генералізованим пародонтитом (ХГП) та 67 осіб контрольної групи. Поліморфізм BsmI (rs1544410) гена VDR визначали методом полімеразної ланцюгової реакції (ПЛР) з наступним аналізом довжини рестрикційних фрагментів. ДНК з букального епітелію виділяли, використовуючи набори NeoPrep50 DNA Magnet («NEOGEN», Україна) згідно протоколу виробника. Ампліфікацію ділянки гена VDR, що містить BsmI-сайт проводили за допомогою пар специфічних праймерів, («Metabion», Німеччина). Для ампліфікації брали 50-100 нг ДНК і додавали до суміші, що містила 5 мкл 5-кратного PCR-буферу, 1,5 мМ сульфату магнію, 250 мкМ суміші чотирьох нуклеотидтрифосфатів, по 15 рМ кожного з праймерів і 0,75 ОД Таq-полімерази («ThermoFisher Scientific», США), об'єм доводили до 25 мкл деіонізованою водою. Рестрикцію здійснювали у суміші з 6 мкл продукту ампліфікації, 2 ОД рестриктази BsmI («ThermoFisher Scientific», США) та буфера R. Суміш інкубували при 37°C протягом 20 годин. Ампліфікати та продукти рестрикції розділяли в 2,5% агарозному гелі, що містив 10 мкг/мл бромистого етидію. Візуалізацію ДНК після електрофорезу здійснювали за допомогою транслюмінатора. Статистичний аналіз проводили з використанням програми SPSS-17. При цьому достовірність відмінностей визначали за χ^2 -критерієм. Значення $P < 0,05$ вважали достовірними.

Результати. Порівняння частоти різних варіантів генотипів за BsmI-поліморфізмом у контрольній групі і серед хворих з ХГП дало такі результати: співвідношення генотипів b/b, b/B і B/B в контрольній групі становило 49,3 %, 40,3 % і 10,4 % відповідно, а в основній – 33, 6%, 44,0 % і 22,4 %. Показник P , визначений за χ^2 -критерієм Пірсона, дорівнював 0,046, що свідчить про достовірну різницю у розподілі алельних варіантів гена VDR за BsmI-поліморфізмом між хворими з пародонтитом та контрольною групою. Даний висновок було підтверджено методом логістичної регресії. У гомозигот за мінорним алелем (B/B) ризик розвитку ХГП у 3,14 раза більший, ніж у гомозигот за основним алелем ($P = 0,019$).

Висновки. BsmI-поліморфний варіант гена VDR асоційований із розвитком хронічного генералізованого пародонтиту в українській популяції. У гомозигот за мінорним алелем B/B ризик розвитку хронічного генералізованого пародонтиту більший, ніж у гомозигот за основним алелем.

EFFECTIVENESS OF A NEW COMPOUND OF DERIVATIVE TETRAHIDROFENDIOXIDE IN THE MODEL OF INDUCTION OF FREE-RADICAL PROCESSES IN VITRO

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Free radicals have a detrimental effect on the biological structure of the human body. Active forms of oxygen, superoxide, peroxide negatively affect the function of proteins, enzymes, bioantioxidants. Damage in the structure of DNA of cells has a negative effect on the processes of replication and transcription. The destructive effect of free radicals is manifested in accelerating the process of aging, weakening the immune system, developing various diseases (including Alzheimer's disease, cataracts, atherosclerosis, ischemic heart disease, pathology of the hepatobiliary system, toxic liver damage by xenobiotics of different structures).

Effective pathogenetic agents used in pathological conditions with high activity of peroxide lipid oxidation (PLO) are antioxidants. However, nowadays in the arsenal of doctors there is a small number of drugs with antioxidant properties, including α -tocopherol acetate (vitamin E), which belongs to natural antioxidants.

The aim of our work was to detect a substance of a new type with high antioxidant activity and low toxicity for warm-blooded ones.

Acetate of α -tocopherol has been selected by us as an analogue of antioxidant activity.

Methods of investigation: The antioxidant activity of the compound of derivative tetrahydrofendioxide was studied on the model of initiated oxidation of methyl esters of unsaturated fatty acids. The intensity of the PLO processes was determined by the contents of the lipoperoxidation products in the incubation environment, in dynamics, after 0, 20, 40 and 60 minutes from the moment when they were initiated by ions of divalent iron.

As a result of the conducted research, after 0, 20, 40 and 60 minutes after introduction into the incubation environment FeSO₄·7H₂O was found that the compound of derivative tetrahydrofendioxide leads to a reliable ($p < 0,001$) decrease in the level of PLO products in the incubation environment not only compared with the control (without addition of antioxidant), but also, most importantly, significantly (after 0, 20 and 60 minutes ($p < 0,01$)) exceeds the antioxidant activity and the reference preparation (acetate α -tocopherol).

Thus, it has been experimentally proved that the compound of derivative tetrahydrofendioxide has a pronounced and sufficiently stable antioxidant activity. Antioxidant activity of the compound of derivative tetrahydrofendioxide is significantly higher than of the natural antioxidant of α -tocopherol acetate and may be used in medical practice as a therapeutic and prophylactic anti-oxidant remedy for the treatment of diseases, in the pathogenesis of which is the activation of lipid peroxidation processes.

THE EFFECT OF A CHITOSAN FILM ON MICROBIAL COLONIZATION OF THE BURN WOUND SURFACE AT DIFFERENT AGE STAGES

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Introduction. Widespread application of an effective topical antimicrobial agent substantially reduces the microbial contamination of the open burn wound surface and reduces the risk of infection. In recent years, a large number of research groups are engaged in producing new and improved wound dressings by synthesizing and modifying biocompatible materials. Wound dressing is one of the most promising medical application for chitin and chitosan. The adhesive nature of chitin and chitosan, along with their antifungal and bactericidal properties and their permeability to oxygen, are very important features in terms of treatment of wounds and burns.

However, age-related features of skin regeneration with chitosan application along with its antifungal and bactericidal activity remain uninvestigated. The aim of our research is to analyze the effect of a chitosan film on microbial colonization of the burn wound surface at different age stages.

Materials and methods. The antibacterial properties of chitosan films were evaluated using rat models. The animals were divided into two groups: group 1 (control) and group 2 (experimental), with each group containing 90 rats (by 30 animals for 3, 9 and 22 months). Thermal wounds sized 1,5 mm in diameter and *depth of IIIb degree* were created on the dorsal side of the thoracolumbar region of the rats. The wounds were covered with equally sized chitosan membranes (chitosan Mw 700 kDa and 87% deacetylated) and cotton gauze as a comparison in group 2. Similarly, control wounds were covered with sterile gauzes without the test material. Treated rats were placed in individual cages and wounds healing were observed at 1st, 3rd, 7th, 14th and 21st postoperative days.

Outcomes. As a result of the bacteriological study, it was found out that constant microorganisms in animals of all age groups are Staphylococcus sp., Streptococcus sp. and Candida sp. Bacillus cereus and Aspergillus sp. are detected in a significantly smaller number. E. coli is present only within the elderly rats in an minor amount. On day 3 of the study, an increase in the number of staphylococci and streptococci is observed. However, such changes are less explicit in the experimental series of animals. Thus, in young animals in the control group, the number of Staphylococcus sp. is $\leq 10^2$ CFU/ml and Streptococcus sp. $\leq 10^3$ CFU/ml, while in experimental ≤ 90 CFU/ml and $\leq 10^2$ CFU/ml, respectively. Number Candida sp. also increases in animals of all age groups, but in animals of mature and aging age the influence of chitosan films is less pronounced than in young animals. On day 7 in animals of an elderly age the number of staphylococci and streptococci reaches a "critical" level for the development of an infectious process - 10^5 microbial bodies per gram of tissue wound. In animals of all age groups of the experimental series, the number of streptococci remains at the level of 3 day of the study ($\leq 10^2$ CFU/ml in young and mature animals and $\leq 10^3$ CFU/ml in elderly animals). Meanwhile, in the control group of animals, the number of staphylococci and streptococci decreases to the 3rd day of the study for only 14 days. It should be noted that on day 14 there have been positive changes in the quantitative composition and characteristics for all types of microorganisms, regardless of their initial quantity, except Candida sp., which level does not change in elderly animals compared to the previous study period and is $\leq 10^4$ CFU/ml and $\leq 10^3$ CFU/ml, respectively, in the control and experimental series. The number of streptococci and staphylococci progressively reduce and at day 21 of the experiment is less than at the beginning of the experiment, while Bacillus cereus and Aspergillus sp. have not identified in this term of study in young and mature animals.

Conclusions. By preventing secondary infection and stimulating the immune system, chitosan provides a positive dynamics of the microbial landscape in the wounds in animals of all age groups. Antibacterial and antifungal properties of chitosan films cause a decrease in the quantity of all types of microorganisms that formed the microbial association in burn wounds as soon as on the 3rd day of the study. Due to the suppression of microflora growth, the number of microorganisms in the burn wounds of the experimental series don't exceed the "critical" level in any age group. Chitosan films had less effect on the microflora of burn wounds in older animals, which may be explained by the age-related features of the immune response.