

PECULIARITIES OF STOMACH LESION IN LABORATORY WHITE RATS CAUSED BY VARIOUS MODES OF STRESS EXERSION

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SUMMARY. Any stress provokes the lesion of mucous membrane in rats' stomach. In chronic stress caused by prolonged hypokinesia, acute stress provokes heavy lesion with erosion and ulcer progress in all rats only during prolonged immobilization (3hours). Various conditions of fourfold an hour-long immobilization stress provoke the occurrence of gastritis, erosion, ulcer marked more in everyday immobilization of animals.

KEY WORDS: stress; stomach; hypokinesia; immobilization; rats.

Introduction. Stomach lesions caused by stress are prevalent among people of different age groups and sex. Stress may cause the affection of cardiovascular system [1], gastrointestinal tract [2], endocrine system. Stress overstrains and chronic stress are of high risk as the latter even of low intensity but prolonged effect provoke exhaustion of compensatory mechanisms and result in pathology progress.

The **aim** of study was to determine stage development of stomach lesions in different stress conditions.

Methods. 48 white male-rats of Wistar line were examined. All of laboratory animals were divided into 6 groups: 1 – follow up, 2 – three-week hypokinesia and one-hour immobilization of animals down of their back on a trial day, 3 – three-week hypokinesia and two-hour immobilization of animals down of their back on a trial day, 4 – three-week hypokinesia and three-hour immobilization of animals down of their back on a trial day, 5 – fourfold an hour-long immobilization of animals down of their back in 72 hours interval between separate stress episodes, 6 – fourfold an hour-long immobilization of rats down of their back in 24 hours interval between separate stress episodes. In 2–4 groups the examination was conducted right after immobilization, in 5–6 – in 24 hours after the last immobilization.

Percent of animals with macroscopic stomach changes namely with its thinning and folding, hemorrhage, erosion or ulcer presence was determined in macroscopic examination of mucous membrane of the stomach.

All the trials were carried out before noon in a specialized premises at 18–22 °C, relative humidity 40–60 % and illumination intensity 250 lx. Experiments were carried out according to European Convention for the Protection of Vertebrate Animals used for Experimental and Other Scientific Purposes (Strasbourg, 03.18.1986), decision of the First National Bioethics Congress (Kyiv, 2001) and

the Decree of Public Health Care Ministry of Ukraine No 690 of 09.23.2009.

Euthanasia of rats was performed by total heart bloodletting after previous *sodium thiopental* anaesthesia (60 mg/kg of animal body weight intraperitoneally). The stomach was taken for further trial.

Results and Discussion. There were no visible changes of mucous membrane in the stomach of experimental rats. Increased folding, thinning of mucous membrane and its slight blood filling were observed in 37.5 % of rats of the 2nd group. The obtained results prove the development of gastritis. In the 3rd group of rats the increase of blood filling of mucous membrane was revealed in 50 % of animals and solitary punctuate hemorrhages appeared in 37.5 %.

The largest changes were observed in the 4th group of animals – blood filling was revealed in 100 % of individuals, multiple punctuate bloodstrokes in 75 %, erosion in 62.5 %, linear ulcers in 50 %. In the 5th group of rats were revealed: folding of mucous membrane in 62.5 %, punctuate bloodstrokes – 50 %, erosion – 25 %, ulcers – 37.5 %. In the 6th group of rats were observed: thinning of the stomach wall and folding of mucous membrane in 87.5 %, punctuate bloodstrokes – 75 %, erosion – 25 %, ulcers – 25 %.

Obtained data indicate significant lesion of animals' stomach under stress. The stomach of the 4th group was under the greatest change, which shows lesion dependence on the duration of immobilization in animals with prolonged hypokinesia. The rise of stress duration provokes the increase as lesions multiplicity as their expression but erosions and ulcers appear only during three-hour immobilization of animals. In the 5th and 6th groups lesions were less than in the 4th group, but considerably larger than in animals of the 2nd and 3rd groups. Received results indicate that single immobilization stress of an hour or two, causes gastritis and minor lesions of mucous and submucous layers of the stomach but recurrent

Огляди літератури, оригінальні дослідження, погляд на проблему, короткі повідомлення

immobilization stress provokes lesions of all stomach layers despite of duration period between the recurrent stress condition.

Conclusions. Thus, any stress provokes the lesion of mucous membrane in rats' stomach. In chronic stress caused by prolonged hypokinesia,

acute stress provokes heavy lesion with erosion and ulcer progress in all rats only during prolonged immobilization (3 hours). Various conditions of fourfold an hour-long immobilization stress provoke gastritis, erosion, ulcer marked more in everyday immobilization of animals.

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ОСОБЛИВОСТІ УРАЖЕНЬ ШЛУНКА, ВИКЛИКАНИХ РІЗНИМИ РЕЖИМАМИ СТРЕСОВОЇ НАПРУГИ У ЛАБОРАТОРНИХ БІЛИХ ЩУРІВ

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РЕЗЮМЕ. Будь-який стрес провокує ураження слизової оболонки в шлунку щурів. При хронічному стресі, викликаному тривалою гіпокінезією, гострий стрес викликає тяжкі ураження з ерозією і прогресом виразки у всіх щурів тільки при тривалій іммобілізації (3 год). Різні умови тривалого іммобілізаційного стресу провокують виникнення гастритів, ерозій, виразок, що відзначаються більше при повсякденній іммобілізації тварин.

КЛЮЧОВІ СЛОВА: стрес; шлунок; гіпокінезія; іммобілізація; щури.

ОСОБЕННОСТИ ПОРАЖЕНИЙ ЖЕЛУДКА, ВЫЗВАННЫХ РАЗЛИЧНЫМИ РЕЖИМАМИ СТРЕССОВОГО НАПРЯЖЕНИЯ У ЛАБОРАТОРНЫХ БЕЛЫХ КРЫС

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РЕЗЮМЕ. Любой стресс провоцирует поражение слизистой оболочки в желудке крыс. При хроническом стрессе, вызванном длительной гипокинезией, острый стресс вызывает тяжелые поражения с эрозией и прогрессом язвы у всех крыс только при длительной иммобилизации (3 ч). Различные условия длительного иммобилизационного стресса провоцируют возникновение гастритов, эрозий, язв, преобладающих при повседневной иммобилизации животных.

КЛЮЧЕВЫЕ СЛОВА: стресс; желудок; гипокинезия; иммобилизация; крысы.

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