

**THE EFFECT OF VITAMIN E ON THE BIOCHEMICAL
PARAMETERS IN THE EXPERIMENT****I. B. Shukurov, Ch. K. Khayrullayev, M. T. Gulomova, F. F. Umurov**
Bukhara state medical institute, Bukhara, Uzbekistan**Key words:** acute pancreatitis, rats, experiment, cytochrome P-450, monooxygenase system, Vitamin E.**Таянч сўзлар:** ўткир панкреатит, каламуш, тажриба, цитохром P-450, монооксигеназа тизими, витамин E.**Ключевые слова:** острый панкреатит, крысы, эксперимент, цитохром P-450, монооксигеназная система, витамин E.

The effect of vitamin E on rat liver cytochrome P-450 in experimental acute pancreatitis (AP) was studied. The animals were divided into 4 groups. The obtained data were compared with the indicators of the 1-st group (intact). During the experiment, the development of AP showed a decrease in the content of cytochrome P450 in the microsomal fraction. The administration of vitamin E to animals of the 4th group led to an increase in the content of cytochrome P-450, strengthening the protection of the liver, the abolition of inhibition of the monooxygenase system of the liver.

ТАЖРИБАДА ВИТАМИН Е НИНГ БИОКИМЁВЙИ ҚЎРСАТКИЧЛАРИГА ТАЪСИРИ**И. Б. Шукуров, Ч. К. Хайруллаев, М. Т. Гуломова, Ф. Ф. Умuroв**

Бухоро давлат тиббиёт институти, Бухоро, Ўзбекистон

Тажрибада ўткир панкреатит (ЎП) да витамин Е нинг каламушлар жигари цитохром P-450 ига таъсири ўрганилди. Ҳайвонлар 4 гуруҳга бўлинди. Олинган маълумотлар 1-гуруҳ (интакт) кўрсаткичлари билан таққосланди. Тажриба давомида ЎП нинг ривожланиши микросомал фракцияда цитохром P-450 микдорининг пасайишини кўрсатди. 4-гуруҳ ҳайвонларига витамин Е юборилиши цитохром P-450 микдорининг ортишига, жигар ҳимоясининг ошишига, жигарнинг монооксигеназа тизимини ингибирланишини бекор қилинишига олиб келди.

ВЛИЯНИЕ ВИТАМИНА Е НА БИОХИМИЧЕСКИЕ ПАРАМЕТРЫ В ЭКСПЕРИМЕНТЕ**И. Б. Шукуров, Ч. К. Хайруллаев, М. Т. Гуломова, Ф. Ф. Умuroв**

Бухарский государственный медицинский институт, Бухара, Узбекистан

Изучили действие витамина Е на цитохром P-450 печени крыс при экспериментальном остром панкреатите (ОП). Животных разбили на 4 группы. Полученные данные сравнивали с показателями 1-ой группы (интактные). В процессе эксперимента при развитии ОП показано снижение содержания цитохрома P-450 в микросомальной фракции. Введение витамина Е животным 4-ой группы приводило к увеличению содержания цитохрома P-450, усилению протекции печени, отмене ингибирования монооксигеназной системы печени.

Acute pancreatitis (AP) is accompanied by severe intoxication. The endotoxic products formed during AP interact with the cytochrome system, in particular, P-450 [1, 2].

Detoxification metabolic processes are among the first to include the biotransformation of lipophilic xenobiotics with the direct participation of cytochrome P-450-dependent monooxygenases. At the same time, cytochrome P-450 is assigned an important role in the oxidative transformation of xenobiotics [3,6,7].

It was previously shown that the pharmacopreparation vitamin E, possessing bioprotective and therapeutic characteristics, has a beneficial effect on the course of AP. However, the effect of vitamin E on the monooxygenase system (MOS) of the liver in experimental AP has not yet been investigated [4, 8].

The aim of the work was to study the effect of vitamin E on the biochemical parameters (cytochrome P-450 MOS of the liver) of rats in the dynamics of the development of AP.

Materials and methods. The experiments were conducted on 64 sexually mature out bred male rats weighing 140-180 gr., Contained in a normal laboratory diet. The animals were divided into four representative groups (16 in each): 1. Intact; 2. Control; 3. Experienced with AP; 4. AP + Vitamin E.

Experimental AP was induced in animals according to the method of P.S. Simovaryan and joint authors (1973). The control animals underwent laparotomy without freezing of the pancreas.

Animals of the 4–th group were daily injected with vitamin E at a dose of 0.5 mg per 100 gr. body weight by oral route for 2 weeks. On the 15–th day the animals were operated on and reproduced in them.

Assessment of the MOC by its main biochemical parameter – the content of cytochrome P-450 in the microsomal fraction of the liver – was carried out in the dynamics of the study: on the 7–th, 10–th, and 30–th days after surgery according to the method of T. Omura, R. Sato (1964).

Results and discussion. The results of the studies showed that in experimental AP (3rd group), the concentration of cytochrome P-450 decreased on the 7th day of the study by 52% and 56%, respectively, compared with the Intact (1–st group) and Control (2–st groups) of rats (table). The most significant decrease in the level of cytochrome P-450 was found on the 10–th day of the experiment - 0.326 ± 0.08 nm/mg protein. Subsequently (after 30 days) there was a twofold increase in the quantitative content of P-450 - 0.63 ± 0.005 nm/mg protein, however, it should be noted that this indicator did not reach the background level of those of the 1–th group (Intact) (table 1).

Table 1.

The content of cytochrome P-450 (nm/mg protein) in the microsomal fraction of the liver of animals during the development of experimental AP ($M \pm m$).

№	Group of animals	Research time, days		
		7	10	30
1.	Intact	$0,765 \pm 0,118$	$0,765 \pm 0,118$	$0,765 \pm 0,118$
2.	Control	$0,717 \pm 0,126$	$0,621 \pm 0,05$	$0,60 \pm 0,03^a$
3.	AP	$0,398 \pm 0,059^{ao}$	$0,326 \pm 0,08^{ao}$	$0,63 \pm 0,005^a$
4.	AP+vitamin E	$0,661 \pm 0,06^*$	$0,631 \pm 0,10^*$	$0,53 \pm 0,001^a$

Note: Reliability $p < 0.05$: - in relation to intact; - in relation to the control group; *- in relation to AP; in other cases, $p > 0.05$.

The data presented convincingly indicate that in AP, the content of hemoproteins responsible for the first stage of xenobiotic biotransformation is significantly reduced, which can lead to inhibition of biotransformation processes and the accumulation of toxic substances in the body of experimental animals.

A study of the effect of vitamin E on the development of AP showed that this pharmaceutical product protected hem proteins from inhibition. So, for example, on the 7–th and 10–th day of observation, the content of cytochrome P-450 in the 4–th group (AP + vitamin E) decreased - 0.398 ± 0.59 nm/mg protein and 0.326 ± 0.08 nm/mg protein, respectively, compared with group 1 (intact), but the detected changes were not statistically significant ($p > 0.05$). At the same time, it was found that the concentration of P-450 cytochrome in the studied periods in the 4th group was significantly higher than the similar values of the 3rd group (AP) by 66% and 94%, respectively.

However, at a later date of the experiment (30–th day), a tendency was observed in a decrease in the quantitative content of cytochrome P-450 in animals of the 4–th group (table), which is undoubtedly lower in comparison with the previous periods of the experiment. The level of cytochrome P-450 in the 4th group (AP + vitamin E) on 30–th day was 16% lower compared to the 3rd group (AP).

Conclusion:

1. During experimental AP, inhibition of the liver of the rat was detected, which leads to the accumulation of toxic products in the body of experimental animals.

2. The prophylactic administration of the pharmacological preparation of vitamin E to experimental animals with AP led to positive dynamics of changes in biochemical parameters (cytochrome P-450).

3. Vitamin E has a hepatoprotective effect and canceled the inhibition of MOS–enzymes.

References:

1. Kurzanov A.N., Zabolotskikh N.V., Myasnikova V.V., Shestopalov A.V. Pathophysiological aspects of experimental cryomodeling of pathological States of the pancreas // *Kuban Med. Scientif. Bull.* – 2016. – 6 (161). – P. 97–100 (in Russian).
2. Melnychuk L.N. Some aspects of pathogenesis of experimental acute pancreatitis in the conditions of selenium // *Diss. on compet. of a scient. degr. PhD, Chita*, 2006. – 124 p. (in Russian).
3. Sabirova R.A., Suleymanov S.F., Shukurov I.B. Study of the effect of tocopherol on the state of lipid peroxidation and antioxidant protection of rats with acute pancreatitis // *Prob. Biol. and Med.* – 2001. – № 4.1. – P. 50–52 (in Russian).
4. Suleymanov S.F., Shukurov I.B. influence of α -tocopherol on monooxygenase system of rat liver with acute pancreatitis // *Uzb. Biol. J.* – 2002. – № 1. – P. 3–5 (in Russian).
5. Dalia A.-A.H., Kawi A., Samraa H., Hashem Kh.S. Histological and biochemical studies on the effect of vitamin E on sodium fluoride induced lung toxicity in adult albino rats // *Egypt. J. Histol.* – 2013. – Vol. 36. – Issue 4. – P. 899–906. DOI: 10.1097/01.EHX.0000437646.32802.c4
6. George M.I., Adelohe O.A. Effect of Vitamine E on Biochemical Parameters in Albino Rats Treated with Galasoline // *J. Sci. Res.* – 2011. – Vol. 3. – № 3. – P. 641–649. DOI:10.3329/jsr.v4i2.7671
7. Kumar Das T., Mani V., Kaur H. et al. Effect of Vitamin E Supplementation on Hematological and Plasma Biochemical Parameters during Long Term Exposure of Arsenic in Goats // *AJAS* – 2012. – Vol. 25. – № 9. – 1262–1268. DOI:<https://doi.org/10.5713/ajas.2012.12043>
8. Yazar E., Col R., Konyalioghlu S., Birdane Ya.O. Effect of vitamin E and prednisolone on biochemical and haematological parameters in endotoxaemic New Zealand white rabbits // *Bull Vet Inst Pulawy.* – 2004. – Vol. 48. – № 2. – P. 105–108.