

UDC 616.36-002

EFFECT OF DARMONAL AND PHYTIN COMPLEX COMPOUNDS ON CARBOHYDRATES METABOLISM AT EXPERIMENTAL TOXIC HEPATITIS

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Rezume

The aim of study was to research the effect of darmonal and phytin compounds on the amount of glycogen and lactic acid in the liver tissues.

Materials and methods. The new compounds of phytin-C were studied: phytin-C, cobalt phytate and patent substance of darmonal obtained from wheat grain cells grown under special conditions. For comparison, the bioflavonoid of plant origin Liv-52, being used in treatment of liver diseases, was also studied. The study was carried out on 60 white rats weighing 120-150 g. The toxic hepatitis was caused by subcutaneous administration of 50% carbon tetrachlormetan oil solution in dose 0.8 ml/100 g for 4 days.

Results. The results showed that the combined introduction of extract significantly enlarged the outcome at joint use drug Liv-52 in animals, and, especially such effect was noticeable with addition phytin-C. The use bioactive substance in combination with complex phytin compound was more effective for accumulation of glycogen in the liver than using the drugs separately, hepatotoxin - carbon tetrachlormetan reduced carbohydrate metabolism and led to increase glycogen in liver tissues as well as the decreased lactic acid. It was determined that the combined treatment was more effective at toxic hepatitis induced by carbon tetrachlormetan, it had the hepatoprotective effect and improved liver function.

Key words: substance of darmonal, darmonal A, Liv-52, toxic hepatitis, glycogen, lactic acid.

ВЛИЯНИЕ ДАРМОНАЛА И КОМПЛЕКСНЫХ СОЕДИНЕНИЯ ФИТИНА НА УГЛЕВОДНЫЙ ОБМЕН ПРИ ЭКСПЕРИМЕНТАЛЬНОМ ТОКСИЧЕСКОМ ГЕПАТИТЕ

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Резюме

Целью исследования является изучение влияния дармонала и соединений фитина на количество гликогена и молочной кислоты в тканях печени.

Материалы и методы. Изучались новые соединения фитина: фитин-С, фитат кобальта и патентированная субстанция дармонал, полученное из клеток зерна пшеницы, выращенных в особых условиях. Для сравнения также был исследован биофлавоноид растительного происхождения Лив-52, используемый при лечении заболеваний печени. Исследование проведено на 60 белых крысах массой 120-150 г. Токсический гепатит вызывали подкожным введением 50%-ного масляного раствора тетрахлорметана в дозе 0,8мл/100 г в течение 4 дней.

Результаты показывают, что совместное введение экстракта значительно превосходит таковое при совместном введении препарата Лив-52 у животных, особенно когда такой эффект был замечен при совместном введении препарата с фитином-С. При применении биоактивного вещества в сочетании с комплексным соединением фитина более эффективно приводило к накоплению гликогена в печени, чем при применении препаратов отдельно, гепатотоксин - тетрахлорметан снижает углеводный обмен и приводит к увеличению гликогена в тканях печени и снижению молочной кислоты. Установлено, что комбинированное лечение более эффективно при токсическом гепатите, индуцированном тетрахлорметаном, оказывали гепатозащитное действие улучшают функции печени.

Ключевые слова: субстанция дармонал, дармонал А, лив-52, токсический гепатит, гликоген, молочная кислота.

BIRIKMALARINING UGLEDOD ALMASHISHIGA TA'SIRI.

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Rezyume

Tadqiqotning maqsadi darmonal va jltin birikmalarining jigar to'qimalarida glikogen va sut kislotasi miqdoriga ta'sirini o'rganishdir.

Materiallar va usullar. Yangi fitin birikmalari o'rganildi: fitin-C, kobalt fitat va maxsus sharoitlarda yetishtirilgan bug'doy don hujayralaridan olingan patentlangan darmonal moddasi. Taqqoslash uchun, jigar kasalliklarini davolashda qo'llaniladigan o'simlik kelib chiqishi Liv-52 bioflavonoidi ham o'rganildi. Tadqiqot 120-150 g og'irlikdagi 60 ta oq kalamushlarda o'tkazildi. Toksik gepatit 4 kun davomida 0,8 ml/100 g dozada uglerod tetrakloridning 50% yog'li eritmasini teri ostiga yuborish orqali qo'zg'atildi. Natijalar shuni ko'rsatadiki, ekstraktni birgalikda qo'llash Liv-52 ni hayvonlarga bir vaqtda qo'llashdan sezilarli darajada ustundir, ayniqsapreparat fitin-C bilan birgalikda qo'llanganda bunday ta'sir ko'rsatilganda. Biofaol moddani fitinning murakkab birikmasi bilan birgalikda qo'llashda u dori-darmonlarni alohida qo'llashdan ko'ra jigarda glikogenning to'planishiga olib keldi, gepatotoksin - uglerod tetraklorid uglevod almashinuvini pasaytiradi va jigar to'qimalarida glikogenning ko'payishiga olib keladi. va sut kislotasining kamayishi.

Uglerod tetraklorid qo'zg'atadigan toksik gepatitda kombinatsiyalangan davolash samaraliroq ekanligi, gepatoprotektiv ta'sir ko'rsatishi va jigar faoliyatini yaxshilashi aniqlandi.

Kalit so'zlar: darmonal, darmonal A, liv-52, toksik gepatit, glikogen, sut kislotasi.

Relevance

The study of biologically active substance, their introduction in medical practice have great significance for increase population's work ability and prophylaxis of various pathological states. In this relation the great interest have biologically active substances taken from wheat. For example, sumalyak which was used by Uzbek people from ancient time in spring, but it has some lack, it is not possible to use for long time. The new biologically active substance on the base of wheat was taken as small powder - darmonal, and, on the base of oats it was darmonal-A (Mahmudjonova K.S., Karimova S.A., 2002) in Pharmaceutic institute. The pharmacological properties of darmonal were caused with content of wide spectrum various bioactive compounds: enzymes, complex B vitamins, proteins, fats, carbohydrates. Patent № (GOST 7169-66).

The liver participation in carbohydrate metabolism has particular significance. One of its activity is keeping glucose in hepatocytes by its transformation in glycogen and discharge in blood, when the reserve is exhausted. It is known that enzymes activity depends on microsomal oxydation of glucose-6-phosphate on pentozophosphate way and amount of glycogen. The glycogen is mainly kept in the liver, muscles, and, it is glucose reserve. But, when glycogen supplies myocytes with glucose-6-phosphate, in liver the glycogen gives glucose itself and other peripheric tissues.

Therefore, the glycogen amount decreasing in

liver reduce coming NADP.N in chain of microsomal oxydation. It leads to retardation of dis-intoxication processes. The decrease activity of fermentative system at liver disease, in its turn, leads to reduce glycogen production and increase lactic acid, disorder of carbohydrate metabolism [3]. At toxic hepatitis the tissue hypoxia develops on the account of microcirculatory changes. It takes to decrease aerobic glycolis and predomination of anaerobic glycolis [2,4]. The high assimilate of glucose and accelerated glycogenolysis are typical for it. Moreover the amount of lactic acid increases in cells and milk- sour hyperacidity is developed. Therefore, one of the most actual problem is the search of drug and bioactive substances with hepatoprotective properties made from natural substances, study effects of their combined application and use in practice.

Aim of our study is research influence of darmonal substance on phytin compounds on the amount of glycogen and lactic acid in liver tissues.

Materials and methods

There were researched the new phytin compounds: phitin-C, cobalt phytate and darmonal, Patent № (GOST 7169-66) which was taken from wheat grains being grown in special conditions. For comparison the bioflavonide of

vegetable origin Liv-52, applicating at hepatic diseases, were used [1].

He study was carried out on 60 white rats with weight from 120 to 150gr. The toxic hepatitis was caused by subcutaneous introduction of 50% oiled tetrachlormetan solution in dose 0,8 ml/100 g for 4 days [5]. All experimental animals with toxic hepatitis were divided into 10 groups: 1 was intact; 11 was control (group with toxic hepatitis caused by tetrachlormetan); 111 group had darmonal extract in dose 10 mg/kg; IV group of animals got darmonal extract in dose 100 mg/kg; V group had 100 mlg/kg of darmonal-A; VI group got phytin-C in dose 100 mg/kg; VII had darmonal extrat and cobalt phytate in dose 200 mg/kg; VIII group of animals got darmonal extract and phytin-C in dose 100 mg/kg; IX group had darmonal extract 100 mg/kg and phytin 100 mg/kg; X group got Liv-52 in dose 100 mg/kg.

These drugs were introduced experimental animals per orally every day. As intact group were taken 6 healthy rats. On the 10th day of study laboratory animals were decapitated under anesthesia then the glycogen was determined in liver tissue by(Zeifter S. et al., 1950), and lactic acid by Byuhner G.Dj. (1965). The taken results were undergone to statistic processing [6].

Results and discussion

At animals of 1 group the amount of glycogen in liver tissues was decreased to 43,7%, but lactic acid increased in in 2,3 times (in comparison with

the same intact animals). The taken results showed that acute poisoning with tetrachlormetan led to accumulation of lactic acid in the liver. At simultaneously introduction of researching substances for prophylaxis of hepatitis development and tetrachlormetan the prevention of sharp decrease glycogen amount and increase lactic acid in liver tissues were observed. There was particular increase of glycogen and reduce lactic acid in tissues of animals from III and IV groups.

Moreover, the darmonal action in dose 10 mg/kg was weak and the results of experiments were statistically incorrect, later, and, further the substance was introduced in the dose 100 mg/kg and the drug increased the level of liver glycogen on 29,6%, lactic acid on 41,4%. In V and VI groups the glycogen content in liver tissue increased on 44,7 and 45,5%, lactic acid was decreased to 60%. At animals of IX group the hepato-protector Liv-52 made the same activity increasing glycogen content on 46,6% and lactic acid on 56%.

Introduction of darmonal with phytin compounds enhanced their general hepatotropic action. Simultaneously intake phytin, cobalt phytate and phytin-C with preventive purpose led to increase the amount of glycogen in liver tissue and decrease the level of lactic acid. Particularly the joint intake of cobalt phytate and phytin-C led to increase glycogen led on 56,6 and 57%, that witnessed on improvement of carbohydrate metabolism and reduce lactic metabolism on 65,4 and 64,4% accordingly.

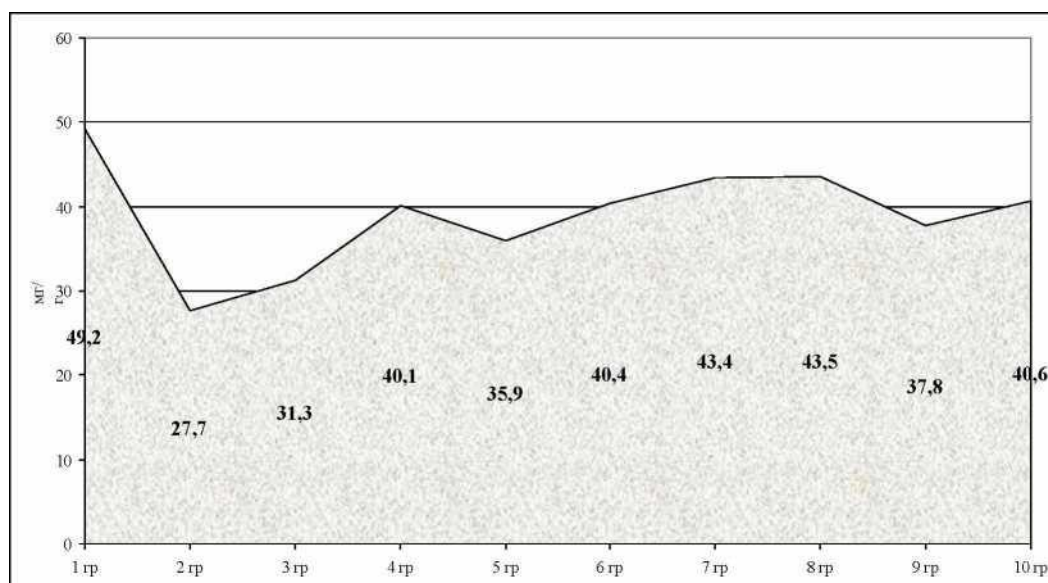
Influence of drug and phytin compounds on level of glycogen and lactic acid in liver tissues at experimental toxic hepatitis, M±m

Group	Glycogen, gr/1	Lactic acid, mmol/1
Intact	49,2±0,92	1,5±0,2
Control group CCl ₄ 0,8ml/100 g	27,7±1,1	5,0±0,76
Darmonal 10 mg/kg	31,26±0,83*	3,85±0,43
Darmonal 100 mg/kg	35,9 ±1,2	2,93 ±0,47
Darmonal-A 100 mg/kg	40,1±1,15	2,0±0,14
Phytin-C 100 mg/kg	40,36±0,56	2,01±0,13
Darmonal 100 mg/kg+Cobalt phytate 200 мг/кг	37,6±1,2	2,34±0,15
Darmonal 100 mg/kg+Фитин-С 100 mg/kg	43,4±1,0	1,73±0,17
Darmonal 100 mg/kg+Phytin 100 mg/kg	43,5±0,92	1,78±0,09
Liv.52 100 mg/kg	40,65±0,77	2,2±0,09

Indices of control group R-Q

Joint introduction darmonal with phytin compounds led to synergistic effect.

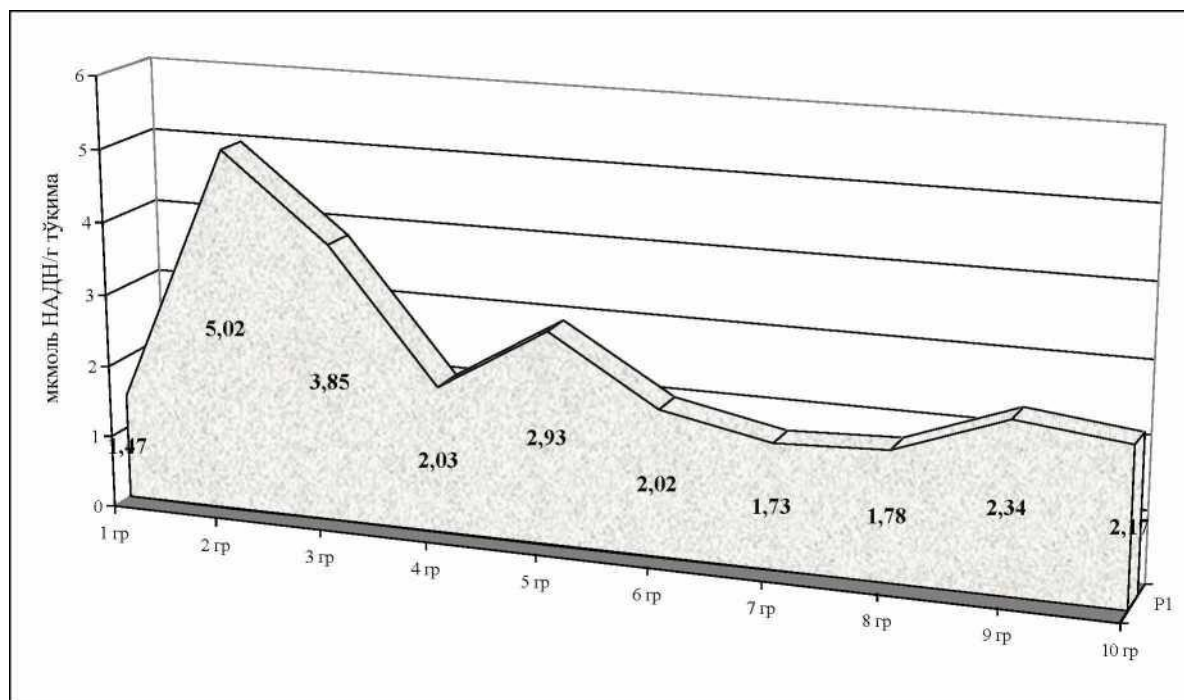
The results show that joint introduction extract considerably surpass the outcomes at adding the medicine Liv-52 in animals, especially such effect was noticed at joint introduction with phytin-C.



Picture 1. Influence of new drugs on the glycogen amount in liver at experimental hepatitis

In our opinion the efficacy of general hepatotropical action may be depended on plenty of organic and inorganic biologically active substances in content of drug substances, antihypoxant, antioxidant и hepatoprotector activity of phytin compounds. At toxic hepatitis the tissue hypoxia was developed on the account of microcirculatory

changes. It led to decrease of aerobic glycolysis and predominance of anaerobic glycolysis. For this it is typical the high mastering of glucose accelerated glycogenolysis. Besides, the amount of lactic acid increases in cells and the milk sour acidosis occur. On this base the amount of lactic acid was determined in liver tissue (pic.2)



Picture 2. Influence of new drugs on amount of lactic acid in liver at experimental hepatitis

At use drug darmonal in combination with complex phytin compound led more effectively to glycogen accumulation than at applicationn them separately, hepatotoxin - tetrachlormetan reduced carbohydrates metabolism and led to glycogen increase in liver tissue and diminish lactic acid.

It means that use darmonal extract at animals with hepatitis leads to restore the function of

glycogen accumulation in the liver. By this feature doesn't yield Liv-52 and phytin-C.

Therefore, it is purposefully to take darmonal in combination with phytin-C and cobalt phytate, because such complex leads to restore the function glycogen accumulation in animals liver.

Conclusions

1. At toxic hepatitis, being caused with tetrachlormetan, the darmonal substance and complex phytin compound protect liver from damage and disorder glycogen biosynthesis in liver tissue and increase lactic acid.
2. The combined application of darmonal and complex phytin compound leads to increase the hepatoprotective action.

LIST OF REFERENCES:

1. Karimova G.A., Mirzaahmedova K.T., Kaldibaeva A.O. «Influence phytin-C and silibor on activity of organo-specific enzymes at toxic hepatitis». //Experimental and clinical gastroenterology 2 (126) 2016.
2. Mirzaahmedova K.T., Abdusamatov A.A., Nabiev A.N. «Influence immunomoduline and phytin compounds on indices of lipid peroxidation at experimental toxic hepatitis». //Siberian medical journal (Irkutsk) 88.5 (2009).
3. Mirzaahmedova K.T. Efficacy of phytin-C and glycitritrate at experimental hepatitis and gastric ulcer: /Synopsis of thesis for doctor of philosophy (PhD) in medical sciences - Tashkent, 2018.-44 p.
4. Mirzaahmedova K.T. "The effect of immunomoduline and phytin compounds on lipid peroxidation induced at toxic experimental hepatitis". /Central Asian Journal of Pediatrics 2.2 (2019); 27-29
5. Nabiev A.N., Tulyaganov R.T., Vahobov A.A. Methodical recommendations in experimental study the new pharmacological substances with bile and hepatoprotective activity. Tashkent, 2007-27.
6. Strelkov R.B. Statistical tables for accelerated quantitative evaluation of pharmacological effect //Pharmacology and toxicology. - 1986. -№4.-P. 100-104.
7. Мирзаахмедова, К. Т., А. А. Абдусаматов, and А. Н. Набиев. "Влияние иммуномодулина и соединений фитина на показатели перекисного окисления липидов при экспериментальном токсическом гепатите." Сибирский медицинский журнал (Иркутск) 88.5 (2009): 122-124.
8. Mirzaahmedova, K. T., Abdullaeva, S. K., Akhmadiev, E. E., & Ziyayeva, S. H. (2017). The effect of immunomoduline and phytin compounds on lipid peroxidation induced at toxic experimental hepatitis. In International Conference on Chemical, Biological and Health Sciences (pp. 99-106).
9. Калдыбаева, А. О., and А. А. Абдусаматов. "Влияние корня солодки, цветков бессмертника и мумиё на показатели перекисного окисления липидов при хроническом токсическом гепатите." Медицинский журнал Узбекистана 3 (2010): 99-101.
10. Dzhabbbarova, Yulduz K., Shoirat T. Ismoilova, and Dilorom A. Musakhodzhaeva. "Importance of cytokines in the pathogenesis of preeclampsia in pregnant women with iron deficiency anemia." Journal of obstetrics and women's diseases 68.5 (2019): 37-44.

Entered 09.02.2022