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ANTIOXIDANT ACTIVITY OF A DECOCTION OF LIQUORICE ROOT AND INFUSIONS OF
HELICHRYSUM FLOWERS

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Resume

The effect of a decoction of liquorice root and an infusion of Helichrysum flowers on the processes of lipid peroxidation in chronic toxic hepatitis was studied. It has been established that a decoction of liquorice root and an infusion of Sandy immortelle flower in chronic poisoning with heliotrin has an antioxidant effect. In terms of hepatoprotective action, herbal preparations are not inferior to the well-known hepatoprotector silibor.

Key words: decoction of liquorice root, infusion of Sandy immortelle flowers, chronic toxic hepatitis, conjugated dienes, dienketones.

АНТИОКСИДАНТНАЯ АКТИВНОСТЬ ОТВАРА ИЗ КОРНЯ СОЛОДКИ И НАСТОИ ИЗ ЦВЕТКОВ
БЕССМЕРТНИКА ПЕСЧАНОГО

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Резюме

Изучено влияние отвара из солодкового корня и настоя из цветков бессмертника песчаного на процессы перекисного окисления липидов при хроническом токсическом гепатите. Установлено, что отвар из солодкового корня и настой из цветков бессмертника песчаного при хроническом отравлении гелиотрином оказывает антиоксидантное действие. По гепатозащитному действию растительные препараты не уступают известному гепатопротектору силибору.

Ключевые слова: отвар из солодкового корня, настой из цветков бессмертника песчаного, хронический токсический гепатит, конъюгированные диены, диенкетоны.

ЧУЧУКМИЯ ИЛДИЗИ ҚАЙНАТМАСИ ВА ЎЛМАС ЎТ ГУЛЛАРИ ДАМЛАМАСИНИНГ
АНТИОКСИДАНТ ТАЪСИРИ

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Резюме

Чучукмия илдизи қайнатмаси ва ўлмас ўт гули дамламасининг сурункали токсик гепатитда ёғлар перексидланиш жараёнига таъсири ўрганилган. Олинган тажрибаларга қура, чучукмия илдизи қайнатмаси ва ўлмас ўт гули дамламаси гелиотрин билан чакирилган сурункали захарланишда оксидланишга қарши таъсирга эга эканлиги аниқланди. Шифобахи ўсимликлардан тайёрланган қайнатма ва дамлама жигарни ҳимоя қилиш таъсири бўйича, гепатопротектор силибор препаратидан қрлишиаслиги келтирилган.

Қалитли сўзлар: чучукмия илдизи қайнатмаси, ўлмасўт гули дамламаси, сурункали токсик гепатит, конъюгирланган диенлар, диенкетонлар.

Introduction

It is known that herbal medicines have been used for the treatment of chronic viral hepatitis and other liver diseases for more than 30 years, and practical medicine has a fairly wide arsenal of various antioxidant medicines. However, when using synthetic drugs, various side effects and complications are often observed, which largely limit their successful use in the clinic.

All this necessitates the search and study of new highly active substances, especially on the basis of herbal remedies, which, in comparison with synthetic ones, have low toxicity. In tills regard,

compounds isolated from the liquorice root are of great interest. Interest in liquorice as an extraordinary and multifaceted plant persists in our time, since liquorice root preparations are successfully used for various diseases (7). The main medicinal properties of liquorice root are mainly due to glycyrrhizic acid and glyceretic acid aglycone. These

glycosides and their various derivatives have a wide spectrum of biological activity. They possess estrogenic, anti

inflammatory (5), anti-ulcer (2), antiallergic (14), antitoxic and hepatoprotective (8) effects and exhibit antiviral activity (6). The introduction into practice of new drugs based on liquorice root, is promising due to their low toxicity and the absence of unwanted side effects. Sandy immortelle is a perennial herb 30-

at a dose of 100 mg / kg for one month (third group). The parameters in rats with chronic toxic hepatitis served as a control.

hi the liver homogenate, the content of diene conjugates (Shilina N.K. et al. 1978), malonic dialdehyde using thiobarbituric acid (Krichevskaya A.A. et al. 1976), as well as the activity of the main enzymes of the antioxidant system, superoxide dismutase (SOD) and catalase were determined.

Experimental conditions	Conjugated dienes, D/1 mg lipid	Conjugated dienketones, D/1 mg	MDA lipid, nmol / 1 g tissue	SOD, conventional units / min mg protein	Catalase, nmol / min mg protein
hitac group	0,450±0,023	0,224±0,014	36,1±1,01	1,45±0,08	0,43±0,016
Control group (chronic hepatitis caused by heliatrin)	0,736±0,0217	0,397±0,028	71,3±1,14	0,52±0,042	0,25±0,019
decoction from liquorice root	0,572±0,028	0,265±0,024	47,2± 1,03	0,87±0,037	0,34±0,019
Infusion of sandy immortelle flowers	0,550±0,016	0,268±0,015	46,7±0,94	0,87±0,063	0,33±0,013
Silibor	0,560±0,024	0,254±0,021	46,8±1,74	0,89±0,07	0,34±0,02

40 cm high, belongs to the Asteraceae administered orally, silibor
Flowers have choleric properties. They are used for liver diseases, cholecystitis, and hepatocholecystitis.

Several plant extracts used to treat gastrointestinal and biliary disorders contain hepatotoxic alkaloids and are more harmful than beneficial. However, a number of extracts contain

Statistical processing of the data obtained was carried out according to the method of Strelkov R.B. (1986).

Results and discussion

family. Flavonoids and flavonoglycosides are found in flowers.

(CT) (Gurevich V.S. et al. 1990; KorolyukM.A. et al. 1988).

substances that have antioxidant, anti-fibrotic, antiviral and anticarcinogenic properties. One of these herbal remedies is glycyrrhizin, a triterpene saponin that is part of an aqueous extract of liquorice root. Therefore, the available data demonstrate the positive effect of glycyrrhizin in chronic viral liver diseases and its hepatoprotective properties.

However, it is rather difficult to judge the effectiveness of glycyrrhizin in the treatment of chronic viral hepatitis, given the virtual absence of randomized placebo-controlled clinical trials.

Despite this, glycyrrhizin certainly deserves attention and further research.

The aim of this work is to study the effect of a decoction of liquorice root and an infusion of immortelle flowers on the products of lipid peroxidation and the activity of enzymes of the antioxidant system in chronic toxic hepatitis.

Materials and methods

The experiments were carried out on 30 male rats weighing 150-180 g. Saline was injected into intact groups of animals. In the remaining groups of animals, chronic toxic hepatitis was induced by subcutaneous administration of heliotrin at a dose of 10 mg / 100g during the first week (Abdullaev N.K. et al. 1989). During the second week, his dose was reduced to 7.5 mg / 100g, and in the subsequent third week, to 5 mg / 100g. For prophylactic purposes, rats in the control and experimental groups for one month orally through a probe in a volume of 1 ml / 100 g were injected with a decoction of liquorice root (first group), an infusion of immortelle flowers (second group) at a concentration of 1:10, and hepatoprotector was also

hi animals with chronic toxic hepatitis, general weakness, disheveledness and a decrease in coat gloss, abdominal distension, and ascites were noted. Death occurs in 40% of cases. Under the influence of hepatotoxin-heliotrin, along with the disturbance of the general condition in rats, the content of diene conjugates and malonic dialdehyde increases in the liver tissue. Simultaneously with the accumulation of lipid peroxidation products, the activity of SOD and CT decreases by 64% and 42%, respectively, in comparison with similar parameters in intact animals. A decrease in the activity of enzymes of the antioxidant system leads to the formation of a superoxide anion. This radical, reacting with hydrogen peroxide, increases the formation of reactive oxygen and hydrophilic radicals, causing destruction of hepatocyte biomembranes and the development of protein and fatty degeneration of liver cells (3). These data indicate that heliotrin, like other hepatotoxins, has a prooxidant effect, leading to disruption of metabolic processes in the liver.

The simultaneous use of medicinal plants with heliotrin leads to a decrease in the disorders of the antioxidant system and inhibition of the enhancement of lipid peroxidation. As a result of the introduction during the month of a decoction of liquorice root and an infusion of sandy immortelle flowers, the content of conjugated dienes decreases by 22% and 25%, respectively, conjugated dienketones - by 32%, malonic dialdehyde by 34% and 35%. Under the influence of silibor, the activity of these enzymes is increased by 71 % and 36%.

If we take this effect into account, then liquorice root and flowers of sandy immortelle, similarly to silibor, have an antioxidant effect and prevent an increase in the intensity of lipid peroxidation. (Table 1.)The antioxidant effect of drug plants is apparently associated with an increase in the activity of enzymes

of the antioxidant system, since the composition of liquorice root contains glycyrrhizic acid (8-24%), flavonoids (4.3%) and organic acids (4.6%) (2). The medicinal properties of liquorice root are mainly due to the content of glycyrrhizic and aglyconglyceretic acid. These glycosides and their various derivatives have a wide spectrum of biological activity.

Most of these substances have direct and indirect antioxidant effects. Probably, these substances lead to an increase in the activity of enzymes and an increase in the function of the antioxidant system of the body. In addition, the studied medicinal plants have anti-inflammatory, choleric, immunomodulatory properties and increase the regenerative potential of liver cells (Saratikov A.S. et al. 1991).

The antioxidant activity of silibor is less expressed. The results obtained indicate that these natural substances have a unidirectional antioxidant effect.

Glycyrrhizin is a calcium and potassium salt of the three basic glycyrrhizic acid, aglycone, which is glycyrrhizic (glycyretic) acid. Glycyrrhizin has anti-inflammatory, antiallergic, antiviral, mineralocorticoid, antiulcer, hepatotropic and immunomodulatory effects. Of particular interest is its antiviral and immune effects.

It is known that glycyrrhizin stimulates the formation of interferon gamma, which in turn activates macrophages and B cells, enhancing phagocytosis and antibody production, and activates NK cells. In a number of works, there are indications of the inhibitory effect of glycyrrhizic acid directly on the DNA and RNA of viruses, which causes the inactivation of viral particles, their suppression, and their introduction through the membrane into the cell, a violation of the synthesis of new structural components of viruses.

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An important property of glycyrrhizin, which partly explains its positive effect on the course of chronic hepatitis, is the ability to suppress the formation of free radicals and the production of lipid peroxides.

It is known that in chronic liver diseases of various origins, the activity of antioxidant defense enzymes decreases, which is associated with the activation of lipid peroxidation processes. The course and severity of damage to hepatocyte membranes depends

on the enhancement of lipid peroxidation and is accompanied by enzymatic deficiency, impaired cell division, leading to their death. For the treatment of chronic hepatitis, various drugs that have a hepatoprotective effect are used (11). For example, such drugs as Essentiale, Essel Forte, Phosphagliv, Apcosul, Herbion, Legalon, Liv-52, Holagol, Carsil, Hofitol, Silibor, etc. However, the arsenal of these drugs is small and does not always satisfy the needs of clinicians. Some hepatoprotective agents cause side effects of varying degrees; in addition, they are all imported. In this regard, the pharmacotherapy of chronic liver diseases should be complex and help correct multifactorial changes in various links of pathogenesis.

Conclusion

1. In chronic toxic hepatitis caused by heliotrin, there is an increase in the processes of lipid peroxidation and a decrease in the activity of specific enzymes SOD and KT.

2. Preventive administration of medicinal plants - liquorice root, sandy immortelle leads to inhibition of lipid peroxidation processes and activation of antioxidant enzymes of the body.

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been conducted that could help develop enteral feeding algorithms for deeply premature infants. A small amount of physiological research has helped to guide better nutritional strategies for premature infants, but do not fully understand the problem of enteral feeding.

Often, meta-analyses of researches that address this problem do not give a definitive answer to many questions due to the existence of differences in the conduct of studies, which makes it difficult to compare their results. In a series of systematic reviews from the Cochrane review database, it was concluded that: (1) minimal enteral nutrition shortens the time to complete enteral feeding and shortens the length of hospital stay; (2) there is too little information to recommend early rather than delayed minimal enteral nutrition; (3) Rapid nutritional expansion leads to better weight gain, but there is insufficient data to clarify the effect of expansion rate on the incidence of ulcerative necrotizing enterocolitis.

Purpose of the study

Evaluation of the effectiveness of the experience of optimizing the feeding of premature infants according to the modern concept of early minimal enteral nutrition.

Materials and research methods:

We examined 80 newborns born in the Republican Perinatal Center (RPC) of Tashkent in the period from 2008 to 2018 with a post-conceptual age of 26 - 32 weeks and a body weight of 1000-1499 grams. All newborns included in the retrospective study were divided into two groups. The main group consisted of 42 premature newborns born after 2015, who received enteral nutrition during the first hours after birth - the "early group". Since 2015, RPC has introduced a "modern strategy for early feeding" of premature babies - the beginning of enteral feeding in the first 72 hours of life, the minimum trophic feeding of the mother's colostrum began in the delivery room, in the absence of contraindications.

The comparison group consisted of 38 preterm infants up to 32 weeks of gestation, born in the RPC for the period 2008-2012, when the "strategy of delayed enteral feeding" was practiced, namely, trophic feeding began after 48-72 hours of life - the "late group". The criteria for inclusion of newborns in the main group and the comparison group were gestational age less than 32 weeks and birth weight less than 1500 grams. Exclusion criteria were congenital malformations, including congenital heart defects; hereditary, chromosomal diseases. NEC in newborns. When examining newborns, the data of a retrospective analysis of the somatic and obstetric-gynecological anamnesis of mothers based on the study of the histories of childbirth and child development, the results of a comprehensive examination, including traditional clinical, laboratory, biochemical, instrumental studies, were taken into account.

Statistical processing of the study data was carried out

on a Pentium-IV personal computer using the Microsoft Office Excel-2007 software package, using the StatSoft statistical software "STATISTICA-6. The level of reliability $p < 0.05$ was taken as statistically significant changes. The correlation analysis was performed on based on the linear *Pearson correlation coefficient - r*.

Discussion results

The average age of mothers in the 1st study group was 28.3 ± 0.78 years, in the 2nd group - 27.0 ± 0.75 years ($p > 0.05$). The analysis of the sex of newborns showed that in the first group there were 31.2% of newborn boys and 68.8% of girls. The average gestational age in the first group was 25.9 ± 0.4 weeks (22.4-28). The second group consisted of 44.7% of boys and 55.3% of girls; the average gestational age of children in this group was 29.9 ± 0.1 weeks (28.2-32).

The birth weight in group 1 averaged 974 ± 60.3 g, and in the second group 1452 ± 58.5 g. ($P < 0.05$), mean body length at birth in group 1 was significantly low in relation to the data of group 2 (32.4 ± 0.8 versus 36.5 ± 0.3 cm; $P < 0.05$). Correlation was observed between gestational age and weight indicators ($r = 0.689$; $p < 0.05$) and child's body length ($r = 0.705$; $p < 0.05$), as well as with parity of childbirth ($r = 0.435$; $p < 0, 02$).

When assessing the condition of newborns at birth according to the Apgar scale at the 1st and 5th minutes of life, it was found that the Apgar scale was significantly lower in newborns of the 1st group relative to the 2nd group ($p < 0.001$). (tab. 1) The analysis of the indicator of physiological loss of body weight at birth on the 5th day in the newborns of the first group was higher relative to the second group ($p > 0.05$). The weight gain on the 7th and 14th days of life was significantly higher in the 2nd group ($P < 0.05$). Cases of sideropenia in terms of peripheral blood hemoglobin at 1 and 2 weeks of life were not observed in both groups. All newborns of the first group ($n = 42$) started enteral feeding in the first 2 hours of life with a few drops of expressed mother's colostrum in the delivery room and followed by bolus feeding every 3 hours according to the national protocol (2016). Feeding was carried out through a tube, since in 88.8% ($n = 37$) of the examined premature infants the sucking reflex was absent, and in three infants it was weak. Conclusions

The use of standard therapy in combination with OMK II in the treatment of IDOV has a positive effect on the course of the disease, thereby, increase of visual acuity, a decrease in sectoral loss in vision fields, the positive dynamics OCT parameters, improving hemodynamic parameters at Doppler imaging in dynamics.

Application OMK II in patients with IDOV is safe because, in patients of the main group were not recorded statistically significant indicators of adverse events and violations of the blood pressure and heart rate.

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