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Case Report

A Toxic Hepatitis Caused the Kombucha Tea – Case Report

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Key words: kombucha tea; toxic hepatitis; diagnoses; therapy; ursodeoxycholic-acid.

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Abstract

Background: Toxic hepatitis may clinically manifest as other diseases of the liver, where it must always be considered in differential diagnoses of unexplained liver damage, such as poisoning with kombucha tea.

Case report: 47-year old female patient was hospitalized and has consumed daily ounces of kombucha tea. During hospitalization patient was diagnosed with toxic hepatitis and treated with intravenous solutions of hepatic protective and ursodeoxycholic-acid (effective therapy).

Conclusion: Examinations showed that kombucha tea has potential to revert the CCl4-induced hepatic toxicity, but used in overdose can induce toxicity himself.

Introduction

Investigation of adverse reactions toxic substances in the liver is a challenge of modern hepatology. It should not be forgotten that toxic hepatitis may clinically be manifested as other diseases of the liver, where it must always be considered in the differential diagnoses of unexplained liver damage in poisoning with the kombucha tea. The pathogenesis and mechanism of liver damage in most of toxins is unknown. It may be experienced as an allergic and/or toxic reaction. Considering that various microorganisms already habituate on kombucha, between those are acid bacteria's (from apple acid used for preparing) which are using the oxygen, and from the other side we have yeasts which are facultative anaerobes.

There is no specific clinical picture of hepatic toxicity of the substance or the drug. It is presented by nausea, vomiting, abdominal pain, diarrhea, jaundice, rash, cholecystitis, neurotoxicity, etc. During hospitalization our patient was diagnosed with toxic hepatitis and treated with intravenous solutions of hepatic protective and ursodeoxycholic-acid as the effective therapy.

Kombucha (Japanese, Russian, Chinese, Indian mushroom, mushroom for longevity, karga - tea, cembua orientals) tea is sugared black tea fermented with a symbiotic culture of acetic acid bacteria and yeasts. Tea fungus symbiosis actually makes two types of organisms: fungi (yeasts) and acetic-acid bacteria (bacterium dzylinum and gluconic, Acetobacter ketogenum, Pichia fermentantsa). Yeasts produce alcohol from sugar and alcohol use bacteria as source of energy and convert it into acetic acid.

When yeasts convert sucrose into glucose and fructose, allowing bacteria to produce gluconic acid and which protects the yeasts from competing microorganisms. It is built in the form of multi-layer membrane, grayish in color and it is not eatable. The kombucha is called thick, slimy, brown cover jelly mass that floats on the surface of sweetened liquid, which after fermentation is used as a tea drink [1].

The tea is gluconic acid, which under normal metabolic conditions is produced by the human liver. The acid goes directly into the blood and has protective role for the human body [1, 2]. Besides the hepatic toxicity it is possible for other unfavorable effects to appear such as gastrointestinal and other systemic pathology, caused by the way of preparation and consumption as well as because of negative interrelation with other medication.

Increasing the acid leads to excessive acidification of blood, which may produce changes in the balance of the body, and in severe cases can even cause death [3, 4].

Kombucha tea is claimed to have various beneficial effects on human health, but there is very little scientific evidence, to support this claim, available in the literature. Examinations showed that kombucha tea has the potential to revert the CCl4-induced hepatic toxicity. Antioxidant molecules produced during the fermentation period could be the reason for the efficient hepatic protective and curative properties of kombucha tea against CCl4-induced hepatic toxicity, but used in overdose can induce toxicity himself. Hystopathological analysis of liver tissue, obtained through biopsy, was important in the clinical diagnoses and causal therapy [3, 4].

Case report

A 47-year old female patient was initially hospitalized at Clinic for infectious diseases of Clinical Centre (Central Serbia) with nausea, fatigue, yellow discoloration of the skin and visible mucous membranes, dark discoloration of urine and discrete neurological problems (anxiety, agitation). Problems have appeared suddenly four days before admission. Problems have initially been reported to the first doctor, who had suspected acute hepatitis due to infectious diseases. When infectious diseases had been excluded, due to elevated hepatogram and cellular necrosis of the liver and muscle, the patient was transferred to the Clinic of gastroenterology in same Clinical Centre. Anamneses excluded earlier acute and chronic diseases, without previously taking any treatment. Subsequently, the obtained data, that patient had consumed daily ounces of kombucha tea, during past two years.

Clinical review has showed yellow skin discoloration aka icterus, finding on the heart indicated a slight systolic murmur over the aorta, other systems examinations were regular. There is no typical clinical picture of liver damage toxins and/or drugs, but is presenting with a broad specter of differential diagnosis of clinical entities.

In laboratory analyzes normal blood-work was registered: negative inflammatory syndrome, elevated liver parameters and muscle necrosis, elevated levels of Gamma-glutamyltransferase (Gamma GT), total and direct bilirubins, normal ionogram, negative markers for viral diseases, negative tumor marker and immunological analysis. Electro cardio graphic (ECG) recorded sinus rhythm in frequency of 80/min. Chest radiography was regular. Abdominal ultrasound, endoscopy of the esophagus, stomach and duodenum were without characteristics. After consulting hematologist, the complete hematological analyses had been performed and other hematological diseases were ruled out.

Determining the values of copper and ceruloplasmin in 24 hour-urine, clinics ruled out the Wilsons' (hepatolenticulare disease). The absence of antimikrozomal antibodies ruled out the primary biliary cirrhosis in the differential diagnosis of liver diseases. Diagnosis of the toxic hepatitis can be set, when all other diseases of the liver are being excluded. During the hospitalization, the patient was treated with intravenous solutions of hepatoprotective and ursodeoxycholic-acid. The patient was discharged after 23 days of hospitalization partially recovered, with elevated inflammatory parameters of muscle and liver, as well as bilirubin, Gamma GT, which are decreasing compared to the initial results. At the first control after seven days parameters are still decreasing, the second control after two weeks, and the third after one month also showed decrease in the analyses but not total recovery. On the fourth control after two months, all parameters were benchmarks: total bilirubin - 150.5, (ref. 5-21 μmol/L); direct bilirubin - 91.2, (ref. 0.1-3.4 μmol/L); AST – 1288, (ref. 0-40 IU/L); ALT – 2163, (ref. 0-40 IU/L); Gamma GT- 608 (ref. 7-50 IU/L) and LDH – 1111, (ref. 220-450 U/L) (Table 1).

Table1: Elevated biochemical parameters and reference values of toxic hepatitis with kombucha tea.

Laboratory analysis (unit)	Initial values (reference values)	Values during hospita-lization	First control	Fourth control
AST (IU/L)	1288 (0-40)	815	87	40
ALT (IU/L)	2163 (0- 40)	1658	201	47
CK (U/L)	1646 (0-171)	759	24	22
CK-MB (U/L)	455 (<25)	419	179	15
LDH (U/L)	1111 (220-450)	495	420	242
Total bilirubin (μmol/L)	150.5 (<21)	90.3	29.8	9.5
Direct bilirubin (μmol/L)	91.2 (0.1–3.4)	47.4	11.0	1.2
Gamma GT (IU/L)	608 (7-50)	545	209	39

Legend:AST - aspartate transaminase; ALT - alanine transaminase; CK - creatine kinase; CK-MB - creatine phosphokinase; LDH - lactate dehydrogenase; Gamma GT - Gamma-glutamyltransferase.

Due to the normalization of the liver function parameters and the causal toxic hepatitis caused by kombucha tea, patient was not submitted to the liver

biopsy.

Discussion

Kombucha tea is sugared black tea fermented with the symbiotic culture of acetic acid bacteria and yeasts as tea fungus. It is claimed to have various beneficial effects on human health, but there is very little scientific evidence available in the domestic and world literature.

Consumption of Kombucha tea as potentially damaging factor in individual concentration can cause hepatitis (when other factors are being eliminated), with clear pathogenesis of hepatitis correlated with using of Kombucha tea.

Kombucha tea along with black tea and black tea manufactured with tea fungus enzymes (enzyme-processed tea) was evaluated for hepatic protective and curative properties against CCl4-induced toxicity, using male albino rats as an experimental model by analyzing aspartate transaminase, alanine transaminase, gamma-glutamyltransferase, creatine kinase, creatine phosphokinase, lactate dehydrogenize and alkaline phosphatase in plasma and malondialdehyde content in plasma and liver tissues (hystopathological analysis of liver tissue, obtained through biopsy, was necessary).

Results showed that kombucha tea has the potential to revert the CCl4-induced hepatic toxicity. Antioxidant molecules produced during the fermentation period could be the reason for the efficient hepatic protective and curative properties of kombucha tea against CCI4-induced hepatic toxicity [1, 2].

NONI-juice (Morinda citrifolia) is an increasingly popular wellness drink claimed to be beneficial for many illnesses. Many authors present cases of novel hepatic toxicity of NONI-juice. Routine laboratory tests and the liver biopsy were performed. The most likely hepatic toxic components of Morinda citrifolia were anthrax-quinones. Physicians should be aware of potential hepatic toxicity of NONI-juice as the one of toxic-plant [5, 6].

Herbal medicines can cause abnormal test results and confusion in proper diagnosis (test results by direct interference with certain immunoassays). For example, kava-kava can cause drug-induced hepatitis, leading to unexpected high concentrations of liver enzymes. Many toxic effects of herbal medicines include cardiovascular toxic effects, hematological toxic effects, neurological toxic effects, nephro-toxic effects, carcinogenic effects and few allergic reactions [7].

The review is based on search of literatures using herbs and herbal traditional Chinese medicines with toxicity. It is included high variability in active/toxic ingredients due to growing conditions, use of inherent toxic herbs causing toxicity, overdose of herbs, drug-herb interactions especially with pharmaceuticals that have narrow therapeutic index, coexisting diseases and idiosyncratic reactions like allergy, hepatitis and anaphylaxis, our patient crossed the line of health in toxicity by overdosing with kombucha tea [8].

Many results obtained during the examination could conclude that M. corchorifolia aerial part extracts have antioxidant and hepatic protective components. Further examination is necessary for isolation and characterization of bioactive molecules which are responsible for hepatic protective and antioxidant activity, what may open a new research topic in our future trials [9].

The glycoside, alkaloid, oxalate, tox-albumin, saponin, terpene and terpenoid containing plants were recorded and found to be responsible for intoxication in animals and humans. Epidemiological data from an Italian survey provide useful information on animal exposure to plants and confirm the importance of plants as causative agents of animal poisoning [10].

Herbal hepatic toxicity isn't uncommonly encountered, but precise incidence and manifestations have not been well characterized. The clinical presentation and severity can be highly variable, ranging from mild hepatitis to acute hepatic failure requiring transplantation. Scoring systems for causality assessment of drug-induced liver injury may be helpful, but have not been validated for herbal hepatic toxicity. Hepatic toxicity features of commonly used herbal products, such as clinic significant herb-drug interactions are discussed. A number of herbal medicinal products are associated with the spectrum of hepatic toxicity events. Advances in the understanding of the pathogenesis and the risks involved are needed to improve herbal medicine safety; something authors have experienced themselves, and whose opinion authors also share [11].

Hepatic encephalopathy is the serious complication of toxic hepatitis. Health-related quality of life (HR-QOL) is impaired in this patients and represents an important outcome measure for further therapy. Assessments included mean changes in the severity of hepatic encephalopathy - related symptoms, changes in disease severity (measured on the modified Clinical Global Impression-Severity scale), and changes in disease status (measured on the modified scale). Patient self-assessment correlated well with the physicians' clinical evaluation. Treatment of toxic hepatitis with oral L-ornithine-L-aspartate in patients markedly improved HR-QOL and was well tolerated by patients [3].

The domestic and world authors reported that, while kombucha tea is considered a healthy elixir, the limited evidence currently available raises considerable concern that it may pose a serious treat for health. Consumption of the kombucha tea should be discouraged, as it may be associated with life-

threatening lactic-acidosis and toxic hepatitis, what was the topic or this article research and will continue to research in some of future articles [4].

In a conclusion, Kombucha tea is claimed to have various beneficial effects on human health, but there is very little scientific evidence available in literature. Even though Kombucha tea is not safe for mass using for it may cause toxic hepatitis, which can be confirmed in laboratory, examinations showed that kombucha tea has the potential to revert the CCl4-induced hepatic toxicity. Antioxidant molecules produced during the fermentation period could be the reason for the efficient hepatic protective and curative properties of kombucha tea against CCl4-induced hepatic toxicity, but even so is true used in overdose can induce toxicity himself. Diagnosis of the toxic hepatitis can be set only if all other diseases of the liver are properly excluded. Effective therapy was with intravenous solutions of hepatic protective and ursodeoxycholic-acid. Hystopathological analysis of liver tissue, obtained through biopsy, was important in clinical diagnoses and causal, known therapy [3, 4].

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