

Modern Trends in the Prevention of Liver Echinococcosis

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Abstract

The results of diagnostics and treatment of patients with liver echinococcosis were analyzed for the period from 2010 to 2018. The follow-up amounted to 59 patients with recurrent liver echinococcosis. The acid-forming function of the stomach was analyzed in 34 patients who were on inpatient treatment for liver echinococcosis. Indicators of secretion were reliably biased towards hypoacidity. We examined 31 families of patients. The total number of examined was 93. In 66,7% of family members who had previously been operated on for echinococcosis, reduced acidity was found. This indicates that the risk of infection with echinococcosis is much higher in a hypoacid state than in normoacidic or hyperacidic gastric juice. A method of using drugs based on albendazole in the preoperative period, as well as to prevent relapses in the postoperative period, has been developed and proposed. The analysis of the incidence of liver echinococcosis in all districts of the Khorezm region was carried out. In all areas, especially in the most endemic ones, sanitary and educational activities are carried out both among the population and among the medical staff of regional clinics. Conducted interconnection with the veterinary service of the region, as well as with the sanitary and epidemiological bodies. The proposed method for applying Decasan residual cavity treatment and ultrasonic cavitation has shown impressive efficiency due to the lower number of relapses.

Keywords: *Liver echinococcosis; hypoacidity; prevention of echinococcosis with hypoacidity; perioperative prevention of recurrence of liver echinococcosis; method of echinococcectomy.*

Introduction

The relevance of the problem. In the Republic of Uzbekistan, more than 4.5 thousand operations per year are performed for liver echinococcosis⁵, and more than a quarter of them suffer from complications¹³.

In recent years, there has been a significant increase in the incidence of echinococcosis, with the number of patients with complicated forms reaching 5–40%¹⁵. Most often the liver is affected, in about 31 - 92% of cases, less often - the lungs, rarely - other organs. Mortality reaches 1.7 - 4.4%, the number of postoperative complications - 5.4 - 57.8%¹⁴.

The difference between echinococcosis and other diseases is the difficulty of preventive measures,

difficulties in early diagnosis, the use of only surgical method of treatment⁵.

The increasing number of cases of echinococcosis, and many medical and social problems associated with it⁷, make it necessary to further search for the causes of infection and method of prevention of this common and severe disease.

Analysis of the literature has shown that many issues of intraoperative and postoperative prevention of echinococcosis remain unresolved and contradictory. Most of the research, including fundamental monographs, scientific articles, as well as PhD and doctoral dissertations, is devoted to the technical features of performing echinococcectomies, using the latest

developments in the field of medical equipment, tools, including “Ultracision”, “CUZA Exel+”, “LigaSure”, cystpericystectomy using an ultrasonic dissector, cystpericystectomy using an ultrasonic destructor-aspirator⁸. Of course, these methods are progressive and should be implemented. However, the vast majority of clinics do not have such equipment⁹.

Recurrent echinococcosis of the liver, strictly associated with the area of primary localization of the parasitic cyst, accounted for 26.6% of all recurrent forms. A large proportion of recurrent echinococcal cysts in segments remote from the primary focus (43.4%) and even lesions of another share (20%) call into question the role of the fibrous capsule of the primary cyst as the main factor of disease recurrence, which means that it is expedient to improve the method of its heat treatment, pericystectomy and wide use of resection technologies¹⁰.

In 1985–1986, *in vitro* experimental studies on the effect of low-frequency ultrasound (LFU) on the germinal elements of echinococcus (GEOE)⁴ were conducted in the Republican Center for Surgery named after Academician V. Vakhidov³.

Studies have shown that, LFU has a powerful parasitocidal effect on GEOE. Even exposure of LFU to the GEOE for 1 to 2 minutes, causes a marked alteration of cells and other structures of the germinative envelope. Changes in brood capsules and protoscolexes, accompanied by the destruction of their membrane components, are irreversible.

The chemotherapeutic effect on GEOE is associated mainly with the use of various albendazole derivatives. The number of courses is unpredictable and depends on the success of chemotherapy and ranges from 8 weeks to 18 months.

However, a meager amount of literature has been devoted to the prevention of recurrence of echinococcosis in the postoperative period and, in general, to the prevention of infection by this pathology in a global, organizational direction. This explains the very disappointing situation regarding the prevalence of echinococcosis in the Republic.

Materials and Method

The results of diagnostics and treatment of patients with liver echinococcosis were analyzed at the Department of General surgery, traumatology and

orthopedics of the Urgench branch of TMA and the Khorezm regional multidisciplinary medical center for the period from 2010 to 2018. Out of the total number of patients – 261 – a catamnestic analysis was performed in 225 patients. The follow-up volume was 59 patients with recurrent liver echinococcosis.

Relapse of the disease was detected in 52 cases out of 225 follow-up groups, and recurrence of echinococcosis was observed in 7 cases out of 36 patients in the prospective group. The largest number of relapses occurs in the following areas: Khiva, Khanka, Khazorasp. In addition, relapses were found in patients operated on in other regions of the Republic. On average, relapse occurred within 5 ± 0.63 years. Repeated relapses occurred in 28 patients within 4 ± 0.53 years.

In the existing literature there are only single and scattered reports of a direct relationship between the incidence of echinococcosis and the degree of inhibition of gastric acid production¹. Found literary information about the role of hypoacidity in the development of echinococcosis creates the prerequisites for an in-depth information search in this direction.

Scientific studies of past years have shown that infection with echinococcosis is much more likely in patients with low acidity of gastric juice¹². Based on the results of these studies, we purposefully conducted a clinical examination of family members of patients who underwent echinococectomy from the liver. It was necessary to give an answer to the question of what dependence is the probability of infection with liver echinococcosis on the acid-forming function of the stomach in adults, as well as what frequency of infection with this disease in persons with normal gastric acidity among family members operated for liver echinococcosis under the same living conditions. We analyzed the acid-forming function of the stomach in 34 patients who were on inpatient treatment for liver echinococcosis by pH-metry. The indicators of secretion were significantly shifted towards hypoacidity, which indicates a significant inhibition of the acid-forming function of the stomach in patients with liver echinococcosis.

Since we have provided district-based statistics on the incidence of liver echinococcosis in the Khorezm region, it was also advisable to conduct a similar quantitative study of dispensary data on the examination of family members operated on for liver echinococcosis.

A total of 31 families of our patients were examined.

The total number of examined was 93. The age of the examined ranged from 21 to 57 years, on average - 38 ± 0.8 years.

Results

In general, the examined did not present complaints during the initial examination. Of the 93 people at the initial examination, 3 were diagnosed with gallstone disease, however, none of this group presented any complaints.

Initially, the examination began with ultrasound sonography (US) control. With ultrasound scan, echinococcosis was not found in 84 people (90.3%). In 6 (6.5%) cases, a single echinococcosis of the liver was found, and in 3 people (3.2%), a comprehensive examination using ultrasound scan and X-ray examination revealed multiple and combined echinococcosis of the liver and lungs. In case of a single liver echinococcosis, the average diameter of the cysts was 4.7 cm, and in patients with multiple lesions, the size of the liver cysts was on average 3.9 cm and for the lungs 4.1 cm. Detection of echinococcosis in a relatively initial stage, therefore, is, in our opinion, is extremely important, since the small size of the cysts can be subjected to chemotherapy without resorting to unnecessary surgical interventions.

In 9 patients with echinococcosis detected during clinical examination, the pH value of the gastric juice was checked.

In the main part of patients, members of families previously operated on for echinococcosis, reduced acidity was found (66.7%). This suggests that with a hypoacid state, the risk of infection with echinococcosis is much higher than with normoacid or hyperacidity of gastric juice. Those 3 patients with normal and high acidity, in our opinion, were infected with echinococcosis due to ingestion of a large number of oncospheres along with poorly washed vegetables. This circumstance requires a systematic sanitary-educational work among the population along with medical examination of family members of patients who have previously undergone echinococcectomy.

Discussion

Since 1983, the world practice has been using the anthelmintic drug albendazole and its derivatives for the treatment of echinococcal cysts less than 5 cm in size

and anti-relapse prevention after surgical treatment. This provision is also enshrined in a resolution of the congress of the Association of Hepatologist Surgeons of Russia and the CIS countries (2014). Retrospective analysis of medical records revealed that 5% iodine solution and 96% ethyl alcohol were used to treat residual cavities. Subsequently, we used the following scheme for the treatment of residual cavities: treatment with 5% iodine solution, 70% ethyl alcohol, and 0.02% Decasan solution. In addition, with medium and large sizes of the residual cavity and the intrahepatic location, ultrasonic cavitation was used with the equipment SIGMA -01, 1990 (France) with frequency of 26.4-26.6 KHz.

We have developed and proposed a methodology for the use of drugs based on albendazole in the preoperative period, as well as to prevent relapse in the postoperative period. Three days before the operation, we use Zentel in a dose of 10-12 mg/kg of body weight. We assume that the period of zentel's presence in the blood, according to the data of manufacturers' research, is 8-12 hours¹¹. By circulating in the bloodstream, Zentel interferes with the implantation of living protoscolexes in the tissue, and also eliminates the risk of dissemination.

In the postoperative period, a week after discharge from the hospital, we prescribe taking Zentel at a dose of 10-12 mg/kg for 28 days together with simultaneous administration of hepatotropic drugs (Carsil, Essentiale, etc.). After this, a break is required for 14 days. We offer 3 to 4 courses of preventive chemotherapy. For multiple lesions, we use 4 to 5 courses.

If a hypoacid condition is detected, we offer a diet that stimulates the secretion of gastric juice, including broths with spices, mashed vegetables and fruits, boiled low-fat meats, fish and poultry, rye stale bread, cabbage and cabbage juice, peppermint, decoctions of St. John's wort, wormwood, calendula, lemons, butter and vegetable oils, cottage cheese, sour milk, buttermilk, juices. In addition, we recommend multivitamins, drugs containing hydrochloric acid, such as acidin - pepsin, enzyme drugs, biostimulants - aloe, pantocrine and others.

In order to prevent liver echinococcosis, as well as for early detection of the disease, we have proposed a method according to which relatives of the operated patients are invited to the clinic, they are given an ultrasound scan. If echinococcosis is detected, in addition to other studies necessary for the upcoming

operation, an analysis of the acidity of gastric juice is carried out. In addition, we identify the most endemic areas of the region where cases of liver echinococcosis are more common. In all areas of the region, especially in the most endemic, sanitary and educational events are held both among the population and among the medical personnel of district clinics. For this purpose, the media are also used - regional newspapers, radio messages. The interconnection with the veterinary service of the region, as well as with the sanitary and epidemiological bodies.

Thus, a retrospective analysis showed the ambiguity of the results of various method of echinococectomy from the liver. A rather significant number of recurrences of echinococcosis of the liver is detected. There are several reasons for this. Firstly, the level of acidity of gastric juice matters, low acidity facilitates infection with echinococcosis. Secondly, the method of processing the residual cavity is important, since protoscolerxes can remain alive and penetrate deep into the surrounding tissues (metastasis). Analysis of long-term results shows that the detection of recurrent liver echinococcosis most often occurs at 4-5 years after surgery. At the same time, there is a need for a control inspection every six months using ultrasound as a screening method.

The proposed method of surgery, including preoperative chemoprophylaxis, postoperative chemoprophylaxis for three years, a method of treating the residual cavity using LFU with Decasan should, in our opinion, significantly reduce the likelihood of recurrence of liver echinococcosis. Preventive and sanitary-educational work among the relatives of the operated patients, as well as close relationship with the veterinary and sanitary-epidemiological services, in our opinion, can significantly reduce the incidence of liver echinococcosis among the population of the Republic.

Conclusion

A specific study of the incidence of liver echinococcosis in the regions of Uzbekistan is essential to reduce the incidence of this pathology, which is of great social and economic importance. The analysis of the incidence of echinococcosis of the liver in all areas of the Khorezm region. The greatest number of morbidity and relapses is observed in Bagat (17.4%), Khiva (16.2%), Khazarasp (13.0%), and Khanka (11.0%) districts.

In a comparative assessment of various method for treating the residual cavity using devastation and technological method, the proposed method for applying

the treatment of the residual cavity to Decasan and ultrasonic cavitation showed impressive efficiency due to the smaller number of relapses.

A complex of preventive measures has been developed to reduce the incidence of liver echinococcosis in the Khorezm region, including postoperative preventive devastation therapy, systematization of sanitary and educational work among the population and medical personnel, a clinical examination of family members of patients operated on for echinococcosis, including a study of gastric acid acidity, use of the media.

Ethical Clearance: No ethical approval is needed.

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