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Optimising Hygienic And Surgical Aspects Of Prevention, Early Diagnosis And Treatment Of Echinococcal Disease

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ABSTRACT

In this scientific report, the authors analyze the results of epidemiological examination cards, as well as the medical history of operated patients for echinococcal disease. The studies were carried out by the authors according to the generally accepted methodology for a retrospective epidemiological analysis of the incidence rate and at the same time an application form was created for examining patients suffering from hydatid disease. According to the authors, the developed "Model of the program of complex medical and diagnostic measures" is intended for early detection and for drawing up a plan for hygienic and surgical complex measures for echinococcal disease. The authors used highly informative research methods (ultrasound, CT, MSCT), as well as biochemical and morphological studies of patients with echinococcal disease in the pre- and postoperative period.

KEYWORDS

Echinococcal disease, epidemiological examination, "questionnaire card", surgical treatment, antiparasitic pharmacotherapy.

INTRODUCTION

Echinococcosis as a severe parasitic disease remains a very urgent medical and social problem in many countries of the world, including some regions of the Republic of Uzbekistan.

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Echinococcal disease (ED) is the most common parasitic disease endemic to Central Asian countries, including Uzbekistan. The disease has been registered in all regions of the republic. According to the Republican Centre for State Sanitary and Epidemiological Surveillance, in 2017 the number of people suffering from echinococcosis in Uzbekistan was 2.1%, and the incidence among children under 14 was 1.2 per 100,000 population.This trend is due to a number of factors, including, first and foremost, the deteriorating sanitary and epidemiological situation, especially in regions endemic for echinococcosis and problems with prevention and medical examinations, including in risk groups .

Despite improvements in the general standard of living, there has been a steady increase in the incidence of echinococcosis with the geographical expansion of the disease. Preventive measures currently used against echinococcosis are effective to some extent, but insufficient; there is no downward trend in the incidence of the disease among the country's population, which often leads to chronic diseases, unpleasant complications and disability. The main reason for this is the lack of public awareness of this infestation and its transmission factors, as well as poor dietary hygiene. Humans become infected by ingestion of the parasite eggs from contaminated food, water or soil, or by direct contact with animals. Among the risk factors for infection with Echinococcosusgranulosus the leading ones are hygiene, overcrowding, lack of personal hygiene and malnutrition. Echinococcal cysts use proteins, fats, vitamins, micronutrients of the host organism for their nutrition and impair the absorption of vitamins. The echinococcal larva lives at the expense of the host by feeding on extracted nutrients, micronutrients and other important bio-nutrients. Protective and adaptive reactions develop between the host and the parasite, and metabolic processes are ensured. Sanitary and hygienic living conditions, violation of rational nutrition and non-compliance with personal hygiene rules play a leading role in the development of EB. In the fight against echinococcosis, improving public health and hygiene skills is essential. Diagnosis of echinococcosis presents significant difficulties in a number of cases, since the issues of repeated reinvasion and forgotten untreated cysts remain unresolved, and the long and often atypical clinical course of the disease creates certain difficulties in modern diagnosis and leads to the development of severe complications that are life-threatening for patients. A number of problems of diagnostics and treatment of echinococcosis are far from being solved and the specific proportion of complicated forms of the disease remains high (25,4 - 84,65%), the number of postoperative complications and recurrent ones varies from 3 to 54%, lethality - 3,1 to 8,6%.

Despite significant progress in surgery in recent decades and improvements in surgical techniques in EB, there is a high recurrence rate of echinococcosis. Many aspects relating to the causes of recurrence, clinical features, and methods of prevention and treatment are unresolved and require further investigation.

Thus, such factors as insufficient awareness of inhabitants of endemic areas, especially the rural sector about the ways of transmission of this disease, neglecting elementary methods of prevention cause an increase in the number of patients with ED. All the above-mentioned was the reason for conducting the present study of this very important and urgent problem. Severe disease outcomes associated with late

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diagnosis and inadequate treatment necessitate the improvement of early case detection methods.

THE AIM OF THE STUDY

To develop therapeutic, preventive and hygienic measures to reduce morbidity and optimize the results of surgical treatment of patients with echinococcosis.

MATERIALS AND METHODS

To achieve the aim of the study the following methods were used; general clinical, laboratory, radiological, ultrasound, CT and multispiral tomography and hygienic research methods.

The work is based on: archival and reporting materials for the period from 2010 to 2019 of the State Sanitary and Epidemiological Surveillance Administration of Fergana province, epidemiological examination charts, as well as case histories of operated on the basis of surgical clinics of Andijan State Medical Institute. The age of the patients ranged from 16 to 76 years. The vast majority of the patients were in the working age category from 17 to 50 years - 91.7%, which emphasises the socio-economic importance of the problem. Men accounted for 48.2% and women for 56.8%. Urban dwellers accounted for 43.6% and rural dwellers for 56.4%. The research was carried out according to the generally accepted methodology of retrospective epidemiological analysis of morbidity and a "Card - questionnaire" (questionnaires) for the examination of patients suffering from echinococcal disease. which aims at early detection and for hygienic and surgical measures in the population suffering from echinococcosis.

The questionnaire includes the following questionnaires:

- Information about the patient suffering from echinococcal disease;
- Circumstances and conditions in which the infection is important in terms of occurrence;
- Sanitary and hygienic living conditions of patients suffering from echinococcal disease;
- Questionnaires to identify hygienic factors of nutrition and the main causes contributing to the development of echinococcal disease.
- Questionnaires for patients operated on for echinococcal disease.

"The questionnaire is to be filled in by patients suffering from echinococcal disease and operated on for this disease, answering these questions by underlining "yes" or "no" and the desired word in the text.

The developed "card - questionnaire" (questionnaire) is intended for;

- Persons whose professional activity is closely connected with animal husbandry;
- Persons at risk;
- Persons working in the agricultural sector;
- People who have close contact with animals
- People living in rural areas with a high incidence of disease;
- Persons who have undergone surgery for echinococcal disease.

The main causes and conditions of the disease were thoroughly analysed on the basis of the results of "questionnaire cards" of patients suffering and operated for echinococcal disease; the condition of operated patients

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was also assessed. We conducted educational activities to prevent the development of echinococcosis and its spread. Transmission routes, such as food, water, and contact, were also explained. The main factors of transmission were, in particular, lack of personal hygiene, consumption of unwashed and thermally untreated products of plant and animal origin, and use of water from natural reservoirs contaminated with excreta of infected animals.

RESULTS OF THE STUDY

Having outlined the main objectives aimed at improving the quality of diagnosis, dynamic monitoring and treatment, as well as with the aim of providing comprehensive therapeutic - diagnostic and preventive measures in the Fergana Valley, we structured our study in the following directions; to outline the range of socio-hygienic aspects, implementation of therapeutic and preventive measures and assess the quality of care for patients with EDto consider the results of surgical treatment, develop an algorithm for diagnosis and treatment of patients with EDand develop a comprehensive therapeutic and preventive measures at all stages of diagnosis and treatment of ED . In this connection, we have developed a model programme for providing therapeutic and preventive measures to patients suffering from

ED in the Ferghana Valley population, which is presented in Figure 1.

According to official statistics for the Ferghana Valley, since 2010 there has been an increase in the number of patients with echinococcal disease.

The development of treatment-diagnostic and preventive complex measures and improvement of hygienic and surgical aspects in EDagainst the background of modern methods of antiparasitic pharmacotherapy in this disease has not only scientific but also great practical importance. The epidemiological analysis of distribution of all cases of echinococcosis by regions and districts has shown that the highest number of patients is registered among the rural population. Health education and hygienic culture play an important role in the prevention of echinococcosis. A questionnaire survey was conducted among 575 rural inhabitants of the Fergana Valley. Analysis of the answers has shown that the population is poorly informed about the factors of echinococcosis transmission, the ways of human infection, and the ways of personal prophylaxis. Health education and hygiene culture play an important role in the prevention of echinococcosis. The questionnaire included questions concerning sanitary and hygienic living conditions, to identify hygienic factors of nutrition and the main causes contributing to echinococcal disease, as well as a questionnaire for operated patients. Analysis of the answers showed that the population is poorly informed about personal preventive measures. Awareness of echinococcal disease was taken into account, as the more the population knew about the ways and means of infection and observed hygiene and good nutrition, the less chance of being infected with echinococcal disease.

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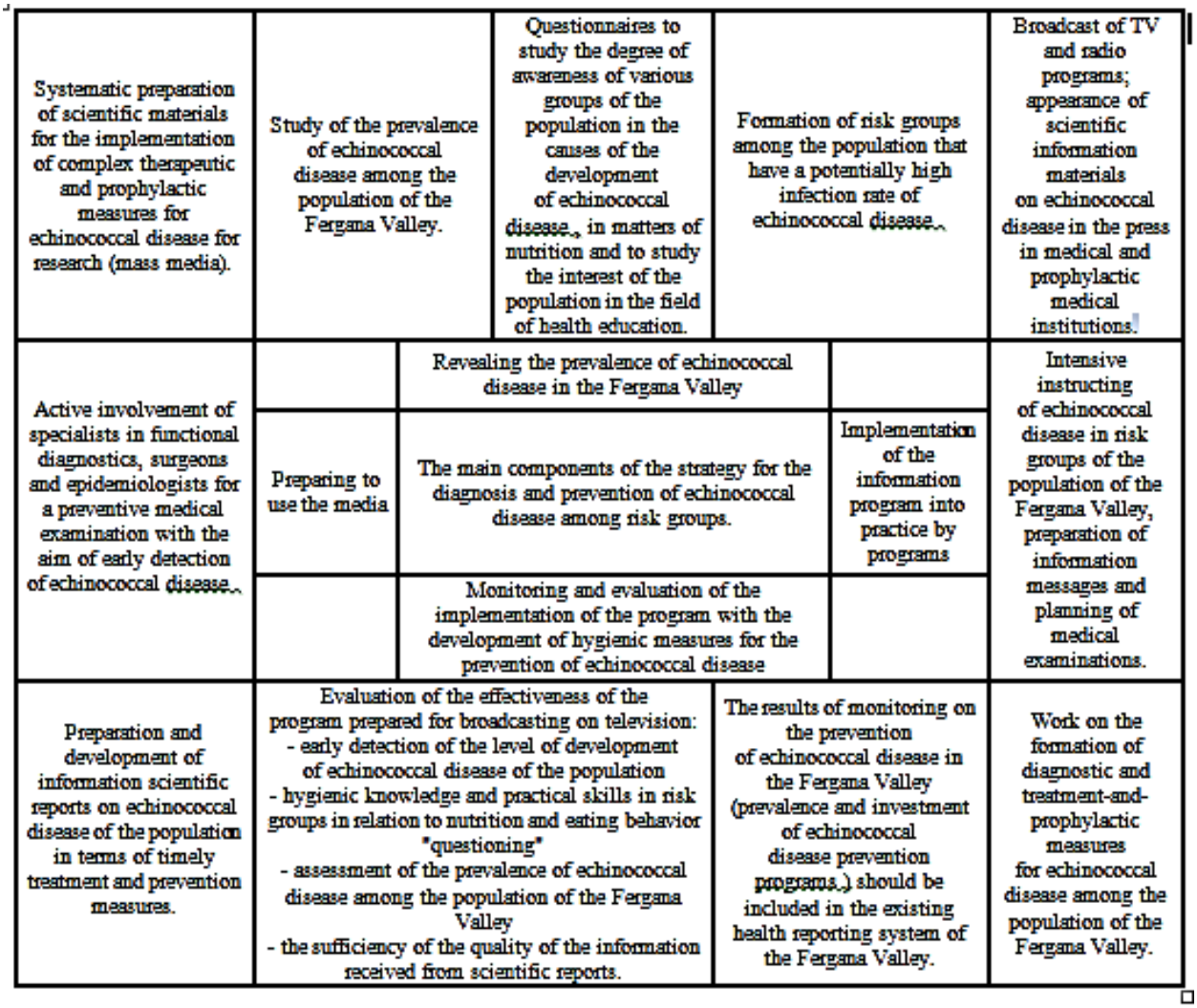

Figure 1: Model programme for comprehensive treatment, diagnosis and prevention of echinococcal disease in the Ferghana Valley

At present, the problems of preserving and strengthening the restorative forces of the organism in patients with EB continue to be topical issues in clinical surgery; in addition, it has been shown that 80% of adverse environmental factors affect the human body through food and water. The main objectives of nutrition are to provide energy and plastic substances or any deviation from the adequate nutritional requirements of the body can cause significant damage to health, leading to a decrease in the resistance of the body in patients with EDA questionnaire was administered to 253 rural residents with ED who were operated on in the surgical district hospitals and at the AGMI clinic. The analysis of the answers showed that the population is poorly informed about the causes ofEDand poorly aware of the possibilities of preventingED. During the survey, attention

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was drawn to the fact that patients suffering from EB are very poorly informed about the rationality and importance of food hygiene. While studying the circumstances and conditions of the disease, it was found out that 102 out of 253 patients surveyed had kept domestic animals and had not observed proper personal hygiene; 230 patients had been systematically carrying out agricultural works, but had not used gauze masks or respirators. The study of sanitary and hygienic living conditions of 253 patients with EB found that 3 - 4% of patients occasionally used imported water, 85% from a tap and 1% from an open reservoir. A questionnaire survey of patients with EB revealed eating disorders in 81% of those surveyed. The survey revealed that 45% of the patients surveyed eat 3 meals a day, 50% eat 3 to 4 meals a day and 5% eat 5 meals a day. Of those surveyed 10% of patients take hot food once a day, 85% take it twice a day and 5% take it three times a day. There were irregularities in the preparation of hot meals and non-compliance with the rules for preparation. Consumption of vegetables, fruit, herbs, strawberries and strawberries also showed irregularities in personal prophylaxis. Out of 253 patients surveyed, 93 patients often used unboiled water and consumed raw milk, in addition, there were violations of personal hygiene before meals and after picking herbs and fruits. According to the results of the questionnaires, 78 people did not follow the rules of pet care and did not prevent faecal contamination of the environment in a timely manner. There were also places of violation of personal hygiene during agricultural works, as well as after caring for livestock and contact with sheep wool. A questionnaire survey revealed insufficient consumption of meat and meat products in the diet. Studies have revealed insufficient intake of the main sources of complete proteins, vitamins, macro- and macro-elements: meat, fish, dairy products, raw fruit and vegetables.To minimise the risk of parasite infection, it is important to monitor the quality of your diet, to eat only after thorough washing or heat treatment and not to drink from suspicious sources. A good diet and good nutritional hygiene play a special role as important as any type of therapeutic treatment.

On the basis of the developed model programme of prevention of complex therapeutic and preventive measures among the population of the Fergana Valley we continue scientific research in this direction. The population of Fergana Valley is informed about diagnosis and prevention of echinococcal disease and other scientific information messages are disseminated through mass media. These information messages were aimed at increasing awareness of echinococcal disease, improving hygienic skills in relation to rational and wholesome nutrition, as well as food behaviour. Thus, we consider the main measures to prevent echinococcosis to be: preventing human infection from domestic farm animals, public health education, observance of personal hygiene rules and violation of personal food hygiene.

The next stage of the study for us was to analyse the surgical activities of surgical clinics of AGMI for the period from 2010 to 2019. This study is based on an analysis of the results of surgical treatment of patients suffering from EDundergoing inpatient treatment in the surgical clinics of ASMIWhen diagnosing and treating echinococcal disease, we follow the algorithm we have developed which is presented in Scheme 2. The age of the patients ranged from 18 to 74 years. And in this group,

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the vast majority of patients were in the working age category from 17 to 50 years - 85.7%, of whom 46.3% were men and 53.7% were women. All the patients were in a severe to moderate degree of severity during the period of observation. The clinical assessment was based on the identification of complaints, clinical examination data, and the results of additional methods of investigation including, clinical and laboratory, radiological, ultrasonography (USG), magnetic resonance imaging (MRI) and multispiral tomography (MSCT). X-ray revealed a rounded shadow with clear contours at the opening of the echinococcal cyst, a rounded shadow with a fluid level, a double-contour wall, chitinous membrane detachment with calcification as "lime spray", a high diaphragm condition - a symptom of "dead diaphragm". On ultrasound, echinococcal masses with clear contours had an irregularly shaped focus and defined topographic size, presence of septa, structures often with the presence of daughter blisters and cavities. It should be noted that in large and giant echinococcal cysts a significant volume of parenchyma were affected by the pathological process, which was accompanied by hepatocyte deficiency and impaired liver function. In this regard, biochemical studies included determination of liver functional indices. The choice of the optimal tactics of the patient management should be individual and based on the analysis of risks and advantages of this or that method, taking into account contraindications. All admitted patients underwent various surgical interventions comparable in severity, volume, and duration. The choice of the timing of surgery, surgical access and type of surgical intervention for recurrent disease was determined by the nature of the previous surgery, localization, number and size of cysts in the liver and other organs, body features and existing complications of the disease.

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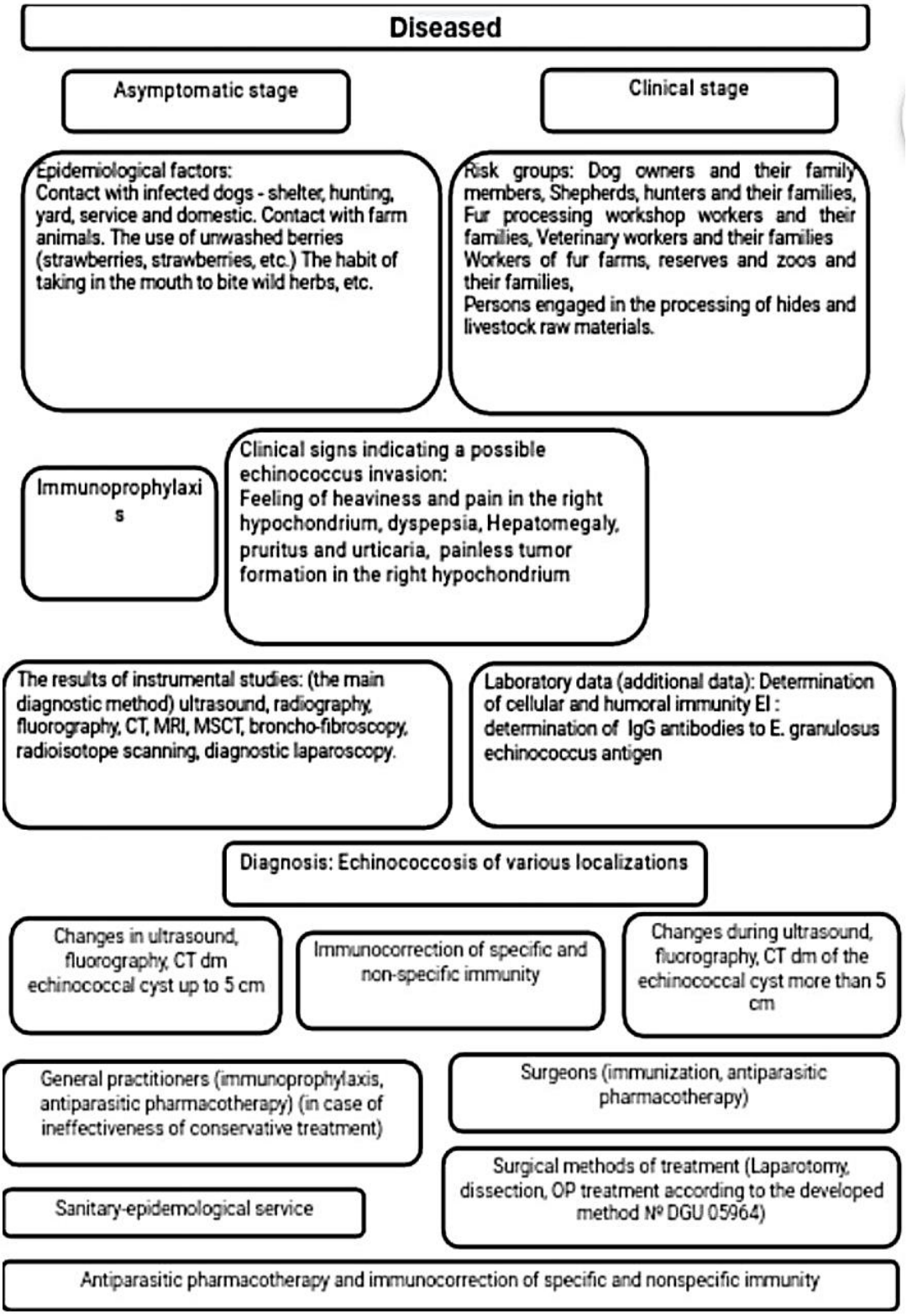

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Figure 2: Algorithm for developing comprehensive treatment and diagnostic interventions

Absolute indications for surgical treatment were large (over 6.5 cm) liver cysts containing a large number of daughter cysts, solitary liver cysts located superficially and/or directly adjacent to the biliary tract or other vital organs, due to the risk of rupture (spontaneous or by trauma), infected liver cysts, and lung cysts. To ensure aparasitic interventions, rational accesses were used taking into account the localization of echinococcal cysts: median, upper-median and oblique incisions. The efficiency of surgical treatment largely depended on the choice of germicidal agent for intraoperative treatment of hydatid cysts. We currently use 0.02% Decasan solution and 10% Betadine solution.

Intensive therapy in the postoperative period included: antibiotic therapy, immunocorrection, correction of malnutrition, infusion and transfusion therapy to correct anaemia, hypoproteinaemia, electrolyte imbalance and maintenance of functions of vital organs and systems, correction of coagulation and anti-coagulation system, detoxification using forced diuresis. The feasibility of prescribing anthelmintic drugs before surgical intervention remains controversial. There is evidence of the effectiveness of preoperative drug therapy, but there is a lack of reliable data in the literature on the appropriateness of this tactic. The undoubted advantage of radical surgical intervention is the cure of the patient, but no mention can be made of complications, which are reported in 2-10% of interventions, and lethal outcomes range from 0.5 to 4%, according to various data. Postoperative antihelminthic therapy significantly improves the efficacy of treatment. Timely administration of anthelminthic drugs practically minimises (less than 1%) the risk of recurrence of the disease, provided that the rules of surgical intervention are followed and all identified cysts are removed.

A comparative analysis of the efficacy of these drugs suggests that albendazole is the drug of choice for contraciliation therapy of echinococcosis. At least 3 courses of treatment were administered to the patients for the purpose of contra-convulsive therapy after surgical intervention. Albendazole was administered in a dose of 10 mg per 1 kg of body weight per day in 1 dose - morning/evening with an interval of 12 hours for 28 days, with the obligatory combination of hepatoprotector. The drug is recommended to be taken with a fatty meal, which increases its bioavailability. The interval between courses was 15 days. Liver function and blood cell counts were monitored before treatment and every 15 days of the first course. If there were no marked changes in blood parameters during the following courses blood tests were carried out at least once a month. Treatment with albendazole was carried out against the background of basic therapy (dietary regime, diet).

CONCLUSION

Analysis of dietary factors and economic activities of the population revealed a definite link between them and the prevalence of echinococcosis. The increase in the number of

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cases is due to the lack of preventive measures and the failure to observe the rules of personal hygiene, as well as in the care of animals and agricultural activities. Nutrition is not rational and the daily norms of nutrition are not met. Due to the low level of awareness of the population, it is necessary to conduct sanitary and educational work on disease prevention. The card-questionnaire makes it possible to qualitatively assess the actual nutrition and to make a targeted plan of preventive and hygienic measures at all stages of diagnosis and treatment of patients suffering from this pathology.The nutrition of patients both before and after the operation must be balanced and of good quality, containing sufficient proteins, lipids, minerals and vitamins, which can prevent postoperative complications. Research in this direction is ongoing and the results will be reported in our future scientific publications.

Due to the low level of public awareness, active public health education on effective measures to prevent the spread of echinococcosis is necessary. Operative intervention in EB should be performed after a comprehensive, pathogenetically based preoperative preparation, instrumental diagnosis and include removal of the parasite, resolution of the residual cavity. As evidenced by our experience, the combined use of highly informative instrumental and laboratory studies ultrasound, CT and MRI allows to determine the localization and size of echinococcal cysts in the liver and abdominal organs, to assess the condition of the fibrous capsule, the presence and nature of complications Chemotherapy for echinococcal disease in the pre- and post-operative period is one of the important aspects, and sometimes the only method, of preventing recurrence. The developed "card - questionnaire" (questionnaire) is likely to contribute to the early detection of the main causes and clinical signs of the disease, as well as a qualitative assessment of the state of the operated patients, gives the possibility to make a timely and targeted plan for preventive, hygienic and surgical measures in regions with high levels of echinococcal disease.The developed programme model is likely to facilitate the early detection of echinococcal disease in the Fergana Valley population and to provide a comprehensive treatment and diagnostic plan.

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