

Efficacy of Albendazole in treatment of Hymenolepiasis

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Abstract. The parasitological efficacy of the drug Albendazole and its combined with the drug Fenasal were tested in the treatment of 98 patients with Hymenolepiasis. Fenasal was prescribed for the duration of 6 days, Albendazole – for two cycles 5 days each, with interval of four days. During the combined treatment of Fenasal and Albendazole the last was prescribed for one day after 6 day course of Fenasal. The efficacy of the combine usage of Fenasal and Albendazole was 75,1±1,4%, of Fenasal – 68,2±1,3%, Albendazole – 61,4±1,5%.

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Introduction

Hymenolepiasis is the cestode that most commonly infects humans, especially school-aged children. In contrast, only a few hundred human infections with the rodent tapeworm, *Hymenolepis diminuta*, a tapeworm for which the human is an incidental host, have been reported. *Hymenolepis* most frequently occurs in warm, dry regions of the developing world, where exposure to human feces results in hand-to-mouth infection. Direct person-to-person spread of *H. nana* may occur [1]. Also hymenolepiasis is one of the wide spread diseases in the southern region of Kazakhstan and Uzbekistan. It was detected in 18,9% among infected by other helminthiasis; including 13% among children [2]. The cases of *Hymenolepis* are registered in both urban and rural areas of the country. The disease is a typical children helminthiasis. *Hymenolepis* plays a very important role in the regional pathology in the southern region of Kazakhstan and Uzbekistan [3].

Hymenolepis were caused by tapeworm *Hymenolepis nana*, which parasites in children's intestinal. Because of biological peculiarities of *Hymenolepis nana*, hymenolepiasis becomes one of the hard-to-cure helminthiasis. The head of *Hymenolepis nana* is easily detached from the body of parasite staying in intestines of a host and therefore begun producing segments [4]. The majority of infections occur as autoinfections as a result of contamination of food or water by humans, usually children, excreting viable eggs in their faeces [5]. While most *H. nana* infections are usually asymptomatic, numerous studies have documented that heavy infections with *H. nana* can cause severe morbidity in children, including severe diarrhoea, abdominal pain, decreased appetite, irritable

behaviour, anal or nasal pruritus, and reduced growth [6]. Parasites can exist in the hosts' organism in both imago and larval stages. Medicines do not have an effect over the parasites in larval stage. The whole vital cycle of *Hymenolepis nana* can go with without leaving intestine of the host. In this causes the eggs of parasite do not exit to environment. Therefore inside intestinal auto reinvasion may develop [7]. The 3 drugs that have been described for the treatment of hymenolepiasis are praziquantel, niclosamide, and paromomycin [8]. Praziquantel, which is bacteriocidal in a single dose for all the stages of the parasite, is the drug of choice [9]. It is available in the United States, well tolerated, and safe. Nitazoxanide has recently been studied as a new treatment option [10].

It is important to search after another new remedies of *Hymenolepis*. Remedies, which are effective against the resistance of causative agent to traditional medical treatment, as well as nontoxic and normalizing deviation induced by parasites.

The research work was focused on study of the efficiency of Albendazole in treatment of *Hymenolepis*; basic Fenasal, monotherapy by Albendazole and combination of two. Albendazole is used in treatment of different types of helminthiasis excluding *Hymenolepis*.

Material and methods

Ninety-eight patients with *Hymenolepis* age to 4 to 25 were under monitoring. Sixty of who were children's, 28 grownups, 65 males and 33 females. Routine clinical and parasitological methods were used. *Hymenolepis* was diagnosed by finding eggs of *Hymenolepis nana* in feces using Kalantaryans method.

Patients complained of pain around navel and epigastria area, hyporexia, general weakness,

headache, vertigo, nausea, vomits, meteorism, constipation or diarrhea, loss of hair, dermatitis and urticariya.

The reduced erythrocytes and content of hemoglobin, hypolymphocytomia, moderate eosinophilia, were observed in peripheral blood.

The patients were divided into 3 groups:

I group – 35 patients took Fenasal

II group – 32 patients combined Fenasal and Albendazole

III group – 32 patients took Albendazole

The using Albendazole during for two weeks supposed that the drug effected on the cysticercoids and on the adults form of parasite.

Fenasal was prescribed for the duration of 6 days, Albendazole was prescribed for two cycles 5 days each, with an interval of four days. During the combined treatment of Fenasal and Albendazole the last was prescribed for one day after a 6 day cycle of Fenasal [table 1].

Hematological studies of peripheral blood were held in all groups before and after the treatment of appropriate drug. The studies include general blood test, biochemical tests – A1AT, AsAT, bilirubin (general, connected, free), thymol's test [table 2].

Results and discussion

Test's results indicated that all medications used in the experiment lead to the increase of the hemoglobin level, decrease in percentage of stab neutrophils and eosinophilia. Combine usage of Fenasal and Albendazole resulted in decline of erythrocyte sedimentation speed.

Biochemical test have indicated that 6 patients in the group where Albendazole was given had A1AT rates increase up to 1.0-1.5 points. Two of them had AsAT rates up to 1.0 point. Fenasal lowered AsAT level. Combined usage of Fenasal and Albendazole haven't detected any changes in biochemical rates.

Discussion

During the treatment good tolerance level to medications; side-effects were not detected in all groups of patients.

The efficiency percentage of combine usage of Fenasal and Albendazole equaled to $75,1 \pm 1,4\%$, Fenasal – $68,2 \pm 1,3\%$, Albendazole – $61,4 \pm 1,5\%$.

Table # 1. Effectiveness of Hymenolepiasis treatment

Medication	Number of patients	Daily dose	Number of intakes	Duration of course of treatment	Effectiveness (%±m)
Fenasal + Albendazole	31	Fenasal 2-7 y.o.-2g Older than 8-2,5g Albendazole 15mg/kg	1 time 2 time	6 days 1 day	75,1±1,4
Fenasal	35	2-7y.o. - 2g. Older then 8-2,5G	1 time	6 days	68,2±1,35
Albendazole	32	1 5 mg/kg	2 time	Two five days cycles with four day interval	61,4±1,5
Fenasal + Albendazole	31	Fenasal 2-7 y.o.-2g Older than 8-2,5g Albendazole 15mg/kg	1 time 2 time	6 days 1 day	75,1±1,4

Table # 2. Biochemical indexes of blood tests of Hymenolepiasis infected patients treated with Ecdisten

	General bilirubin	Connected bilirubin	Free bilirubin	Alanin-aminotransferase	Aspartat-aminotransferase	Thymols taste
M ₁ ±m ₁	16,32±0,71	4,02±0,55	12,17±0,49	0,59±0,03	0,41±0,026	3,785±0,1
M ₂ ±m ₂	16,22±0,70	2,67±0,49	13,55±0,60	0,495±0,02	0,337±0,02	3,47±0,09
t	0.1	1.83	1.006	2.64	2.22	2.34
p	>0.5	>0.05	>0.1	↓<0.05	↓<0.05	↓<0.05

Conclusion

Good level of tolerance to Fenasal, Albendazole and their combination, no side-effects detected.

The treatment of Hymenolepidiasis with Fenasal and Albendazole results in high level of hemoglobin and decrease in percentage of stab neutrophils and eosinophils.

Albendazole brings up levels of A1AT and AsAT, therefore should be prescribed along with a control of biochemical indicators of liver.

Fenasal and Albendazole are first choice medication in Hymenolepidiasis therapy. The highest rates of effectiveness are observed amongst following combination: Fenasal and Albendazole $75,0 \pm 1,4\%$, Fenasal – $68,2 \pm 1,3\%$, Albendazole – $61,4 \pm 1,5\%$.

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