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Blood sugar level of nematode (Aspicularis tetraptera) infected mice, treated with Terminalia arjuna.

S. Gaherwal and Nageshwar Wast

Department of Biotechnology, Govt. Holkar Science College, Indore (M.P.), India

ABSTRACT

The present study deals with the effect of Nematode (Aspiculuris tetraptera) parasite on blood sugar of mice infected and treated with Aqueous and Methanol extract of Terminalia arjuna bark. The aim of present study was find out to effect of parasite on blood sugar level of host and effect of herbal drug on parasite. The mice carrying heavy infection showed decrease in the blood sugar but after drug (Aqueous and Methanol extract of Terminalia arjuna bark) treatment blood sugar was become on normal range due to killing of worm by drug. Methanol extract of Terminalia arjuna is more effective than aqueous extract of Terminalia arjuna. The decreased value of blood sugar in infected mice due to during nematode infection host consumes low quantity of food and nematode parasites consume the host blood glucose as food.

Keywords: Aspiculuris tetraptera, Blood Sugar, Nematode, Terminalia arjuna, Aqueous extract and Methanol extract

INTRODUCTION

Helminths are most common infectious agents of humans and the useful animals in developing countries [1-3]. The World Health Organization reveals that more than two billions of people are suffering from parasitic infections [4]. It is expected by the year 2025; about 57% of the population in developing countries will be influenced [5]. Helminth infections are among the most widespread infection in humans, distressing a huge population of the world. Although the majority of infections due to helminthes are generally restricted to tropical regions and cause enormous hazard to health and contribute to the prevalence of undernourishment, anemia and eosinophila [6-7]. Parasitic diseases cause ruthless morbidity affecting population in endemic areas [8]. The gastrointestinal helminthes become resistant to currently available anthelmintic drugs therefore there is a foremost problem in treatment of helminthes diseases [9]. Hence there is an increasing demand towards natural anthelmintics. Therefore the present investigation was undertaken to evaluate the anthelmintic efficacy of *Terminalia arjuna* based on blood sugar level of infected and treated mice.

MATERIALS AND METHODS

Plant extract and Chemotherapy

Terminalia Arjuna plant (Bark) aqueous and methanol extracts were used for treatment of the induced infection. 1 ml Aqueous and methanol extract of different concentration was given to each mouse. The plant extract treatment was given on 17, 18 and 19^{th} post infection days. Each dose was given once a day for three consecutive days (OD x

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S. Gaherwal et al

3). The different doses of the proposed plant extract were administered to the infected mice to assess their therapeutic efficacy in experimental *Aspiculuris tetraptera* infected mice.

Preparation of the plant aqueous extract

For this 0.1gm, 0.08 gm, 0.06 gm, 0.04 gm and 0.02 gm of plant part (Bark) was taken, dried and then finely ground and 10 ml of distilled water was added respectively. It was then heated until it nearly half i.e. approximately 5 ml of each concentration solution. It than was filtered by what man filter paper no.1. Than it was centrifuged at 2000 rpm for 10 min. the supernatant which contain clear, fresh extract of respective part of medicinal plant was used for experimental work.

Preparation of the plant methanol extract

For this 0.1gm, 0.08 gm, 0.06 gm, 0.04 gm and 0.02 gm of plant part (Bark) was taken, dried and then finely ground and 10 ml of methanol was added respectively. It was then filter with the help of whatman filter paper no.1. Filter solution was centrifuge at 5000 rpm for 10 minutes. Pellet was discarded and supernatant was used for experimental work.

Preparation of inoculums for infection

The dose of 100 eggs were prepared in 0.2 ml suspension of distil water and given orally with a suitable syringe fitted with a feeding needle. After inoculation, mice were kept in cages, labeled according to the experimental design, were fed routinely with the same standard diet.

Experimental Animal and Experimental Parasite

Total 35 inbred female Swiss albino mice, *Mus musculus albinus* of 6-8 weeks old and 15-20 gm in weight were selected. Five mice were used for positive control, 5 mice used for negative control and 25 mice used for experiment. For the present investigation *A. tetraptera* was selected as an experimental parasite and it being routinely maintained in the laboratory by serial passage.

Sampling

Blood from experimental and control mice was collected by cardiac puncture under mild ether anesthesia, before incision each mouse were swabbed with 90% alcohol, heart ex posed, blood collected from the ventricle by a 2 ml sterilized dry glass syringe fitted with a suitable in cold overnight for clotting after which serum carefully pipetted out in to clean sterilized serum collecting tubes and stored at -20° C until required.

Estimation of Blood sugar

Estimation of blood sugar was by Folin Wu method [10].

RESULTS

The results of blood sugar level are summarized in table 1 and presented by fig. 1. The blood sugar level in non infected non treated (control-1) was 95 mg/dl and in infected non treated (control-2) was 80 mg/dl. The blood sugar level was decrease in control-2 as compare to control-1. Mice were treated with aqueous extract of *Terminalia arjuna* bark the blood sugar level were increased 80, 80, 83, 87 and 88 mg/dl at 1 ml doge of different concentrations 0.02gm/10ml, 0.04gm/10ml, 0.06gm/10ml 0.08gm/10ml and 0.1gm/10ml respectively. So the maximum blood sugar level was 88 and minimum 80 mg/dl was found at 1 ml dose of 0.1gm/10ml & 0.02 gm/10ml concentrations respectively and the blood sugar level per cent alter were found to be 0%, 0%, 3.61%, 8.04%, 9.09% at the 1 ml dose of different concentrations 0.02gm/10ml, 0.08gm/10ml, 0.02gm/10ml, 0.02gm/10ml and 0.1gm/10ml, 0.08gm/10ml and 0.1gm/10ml respectively.

Mice were treated with methanol extract of *Terminalia arjuna* bark the blood sugar level were increased 86, 89, 91, 93 and 93 mg/dl at 1 ml dose of different concentrations 0.02gm/10ml, 0.04 gm/10ml, 0.06gm/10ml, 0.08gm/10ml and 0.1gm/10ml respectively. So the maximum blood sugar level was 93 and minimum 86 mg/dl was found at 1ml dose of 0.1gm/10ml & 0.02 gm/10ml concentrations respectively and the blood sugar level per cent alter were found to be 6.97%, 10.11%, 12.08%, 13.97% and 13.97% at the 1 ml dose of different concentrations 0.02gm/10ml, 0.04 gm/10ml, 0.06gm/10ml, 0.08gm/10ml and 0.1gm/10ml respectively. The Maximaum blood sugar level per cent alter was found 13.97% in methanol extract of *Terminalia arjuna* bark at 1ml dose of 0.1gm/10ml concentration and minimum blood sugar level per cent alter was found 3.61% in aqueous extract of *Terminalia arjuna* bark at 1 ml

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S. Gaherwal et al

dose of 0.06gm/10ml concentration. From the above mentioned results, we conclude that methanol extract of *Terminalia arjuna* bark is more effective then aqueous extract of *Terminalia arjuna* bark.

Group No.	Group name of Aqueous extract	Group name of Methanol extract	Dose and concentration	Mean Blood Sugar Value in mg/dl		Per cent alter	Per cent alter of
				Aqueous extract	Methanol extract	extract	methanol extract
1.	NINTC ₁	NINTC ₁	-	95	95	-	-
2.	INTC ₂	INTC ₂	-	80	80		-
3.	ITTAA ₁	ITTAM ₁	1ml of 0.02gm/10ml	80	86	0%	6.97%
4.	ITTAA ₂	ITTAM ₂	1ml of 0.04gm/10ml	80	89	0%	10.11%
5.	ITTAA ₃	ITTAM ₃	1ml of 0.06gm/10ml	83	91	3.61%	12.08%
6.	ITTAA ₄	ITTAM ₄	1ml of 0.08gm/10ml	87	93	8.04%	13.97%
7.	ITTAA ₅	ITTAM ₅	1ml of 0.1gm/10ml	88	93	9.09%	13.97%

 Table – 1: Blood Sugar level in A. tetraptera infected mice treated with different concentrations of aqueous and methanol extract of Terminalia arjuna (Bark).





DISCUSSION

In the present investigation blood sugar value was decease in *A. tetraptera* infected mice as compare to non infected mice. When the infected mice were treated with aqueous and methanol extract of *Terminalia arjuna* bark, the blood sugar value were increased and become normal similar to non infected mice.

Helminthes parasite infection causes the decrease in blood sugar level. This was due to during helminthes infection host consume low quantity of food and helminthes parasites consume the host blood glucose as food [11-13]. A significant increase in level of blood glucose after the treatment by herbal drugs in infected animal. This was due to kill the parasite by herbal drugs and host consumes the proper food [12-13]. Helminth infection led to significant decrease in the level of blood glucose. The decrease in the blood glucose was due to blocking and destruction of blood capillaries [14]. In the present investigation the blood sugar level was decrease in *A. tetraptera* infected mice and after treatment the blood sugar level was significantly increased similar to normal. Thus the results of present investigation are supported by above mention author.

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