EFFECT OF BENZIMIDAZOL ON THE VIABILITY DEVELOPMENT AND SIZES OF *ECHINOCOCCUS GRANULOSUS* PROTOSCOLICIES IN MICE

Abdul jabber Rasmi

Department of Anatomy,College of Veterinary Medicine, University of Basrah,Basrah,Iraq.

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ABSTRACT

This study was designed on to show the effect of albendazol and mebendazol alon and their combination on surviral , development and size of *Echinococcus granulosus* protoscolicies of (10 mg/ml) intraperitoneal in mice. The study show that the mebendazol and combination drugs were greater than the albendzol during on the first four days nor effect on the five day in vivo intraperitoneal administration of combination drugs were greater than albendazol and mebendazol alone on the development and size of cysts which about (5.2±2.17) , (7.0±1.0) , (10.0±3.16) for the development and (1.13±0.38) , (1.18±0.54) , (1.20±0.49) for the ysts size.

INTRODUCTION

Benzimidazol derivatives such as albendazol and mcabcndzaol are currently used for the long – term chemotherapy of alveolar echinoccosis[1,2,3], albendazol is poorly resorbed and is rapidly metabolize. Alveolar echinococcus is prevalent in many region where the disease is endemic it is well known as apublic hearth hazard to humans[4]. Recently several drugs have been reported to effective against human hydatidosis. It been reported that mebendazol abenzimidazol compound are effective against the growth of hydatidosis in man[5,6] and labroratory animals[7]. It also shown that albendazol reduce the development of hydatid cysts in gerbil[8]. This study was carried out to compare the protoscolicidal effect of albendazol and mebenazol and it is combination in mice.

MATERIALS AND METHODS

The hydatid cysts were obtained from Al-basrah slaughter. Protosscolicies were collected and washed three times in physiological saline, then sedimented by gravity and uniform suspension of protoscolicies was prepared in physiological saline (2ml) of each solution were temp equilibrated in a test tube at (37C°) of the viable protoscolicies about (800) protoscol. The

exposed surface of the cysts was painted with (1%) iodine solution in (95%) ethanol, the viability of protoscolices was determined by (0.1%) eosin solution[9] when examined. The number of protoscolices were counted by [10].

Antihelminthics:- Albendazol from (Smith Kline of French laboratories) mebendazol from (Janseen pharmaceutical – 10ug/ml) suspension in distilled water were made for in vitro experiment and for intraperitoneal inoculation of mice.

In vivo experiments: Twenty mice within age (25 days) were injected intraperitoneally with (0.1 ml) protoscolices, first group was inoculated with (10 ug/mg) body weight albendazol, seconed group with (10 ug/gm) body weight mebendazol, third group inoculated with combination for ten days. Mice were killed and examined for size and number of cysts.

RESULTS

In vitro, the effect of mebendazol and combination of drugs on viability of protoscolices on the first three days after incubation were greater albendazol but on four and five day there was no significant differences table (1). The total number of (cysts/mouse) treated with combination of drug were lower than those treated with either albendazol or menendazol and control table (2). Table (3) show that conbination of albendazol and mebendazol reduce size of cycts more than using albendazol or mebendazol alon.

Table (1):- effect of albendazol , mebendazol and their combination on the viability of potoscolicies

Treatment	Mean of four samples ± SD Days after incubation				
	1	2	3	4	5
Albendazo + mebendazol	40±16	36±0.2	10±0.1	4±0.8	-
Albendazol	50±23	30±24	20±0.8	4±0.8	-
Mebendazol	40±31	35±2.4	10±0.8	4±0.8	-
Control	60±2.4	50±1.6	30±1.3	10±1.3	few

Table (2):- Numbers of hydatid cysts in liver and lung of mice treated with albendazol, mebendazol and combination

Treatment	Mean of cysts ± SD		Mean number of cysts / mouse
	Liver	lung	
Albendazol+mebendazol	2.6±0.55	0.6±0.55	5.2 ± 2.1
Albendazol	2.6±0.89	18±0.84	7.0 ± 1.0
Mebendazol	2.75±0.95	1.5±0.58	7.0±1.0
Control	4.0±2.45	2.0±0.0	10.0±3.16

Table (3):- Size of hydatid cysts in liver and lung of mice treated with bendazol mebendazol and combination

Treatment	Mean size of cysts ± SD		Mean size of cysts / mouse
	Liver	lung	
Albendazol+mebendazol	1.25±0.32	0.67±0.29	1.13±0.38
Albendazol	1.41±0.46	0.67±0.25	1.18±0.54
Mebendazol	1.36±0.25	0.75±0.27	1.20±0.49
Control	1.96±0.46	0.81±0.26	1.69±0.65

DISCUSSION

A parasitocidal effect of treatment with various concentration of benzimidazol was reported by[11] in that study in vitro model of *Echinococcus multilocularis* with parasites grown the parasitocidal effect of mebendazol treatment was determined by observing the loss of cysts and by reduce the parasite proliferation. In present study effect of albendazol, mebendazol and combination on the viability of protoscolicies reduce the survival of protoscolicies were marked on the first three days post infection this due to lack of supply of nutrient required for parasite metabolism[12] this result agree with [13] who confirmed that the earlier results that the main

metabolites present in vesicle fluid are succiuate acetate, alanim and Lactate these compounds are all end products of the accepted pathway of glucose metabolism. Mebendazol and combination of drugs seems to affect this reduction earlier than albendazol alone this effect of these drugs might be due to interference with glucose uptake by this parasite and this agreed with the result of[14] who confirmed that benzimidazol induce the blockage of glucose absorption and lead to glycogen depletion. In the present study also a dose of (10 ug/gm) of benzimidazol reduce the number and size of hydatid cysts in albino mice and the effect of combination were greater than either treatment alone where this could be explained by synergistic effect of combination drugs by more damage to the parasite[15]. Also in the present study neither mebendazol or bendazol prevent the development of hydatidcysts and this may due to low doses of both treatments and the delay in administration of treatment after intraperitional inoculation of protoscolicies, showed[16] that daily administration of 50 mg/kg body weight of mebendazol for (10) days in mice prevents the development of cysts also the [17] found complete prevention of development of cysts in gerbils using (10mg/kg) for (15) days. Finally the present study suggest using a combination drugs as aprophylaxis for hydatidosis also the treatment should be administrated in high dose in order to maintain effective level of the drug.

تأثير مركبات البندزيميدازول على حيوية وتطور واحجام رؤيسات الاكياس المائية في الفئران

عبد الجبار رسمي حويط
فرع التشريح،كلية الطب البيطري،جامعة البصرة،البصرة،العراق

الخلاصة

صممت هذه الدراسة الى بيان تأثير كل من البنزيميدازول والمبندازول كلا على حده أو بأستخدمها معاً على حيوية، وتطور واحجام رؤيسات الاكياس المائية بأستخدام جرعة مقدارها (10 ملغم/مل) داخل الخلب في الفئران. أظهرت الدراسة ان تأثير المبندازول بالاضافة الى العقارين معاً كان اكبر من تأثير البندازول خلال الأربعة أيام الأولى من التجربة ولم يلاحظ أي تأثير في اليوم الخامس مقارنة مع مجموعة السيطرة. كذلك فقد كان تأثير العقارين معاً أكبر على تطور الرؤيسات حيث بلغ اعداد الاكياس لكل فئه (5.2±2.1) بينما بلغ تأثير البندازول والمبندازول (0.7±1) مقارنة مع مجموعة السيطرة والبالغة (10.0±3.1) أما تأثيرهما على حجم الأكياس المائية فقد كان تأثير العقارين سوية اكبر من تأثير البندازول والمبندازول كلاً على حدة حيث بلغ معدل حجم الأكياس لكل فأر (1.13±0.38) و (18±0.5) و (1.20±0.49) على التوالي مقارنة مع حيوانات مجموعة السيطرة والتي بلغت (1.69±0.65).

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