

EFFICIENCY OF THE COADMINISTRATION OF CASTOR OIL AND PIPERAZINE CITRATE DRUG IN EXPULSION OF *ASCARIS LUMBRICOIDES* IN MAN⁺

فعالية إعطاء عقار سترات البيرازين مع مساندة زيت الخروع في طرد طفيلي الصفرّ
الخراطيني في الإنسان

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Abstract:

From December 1988 till march 1991, a total of 102 infected patients with *Ascaris lumbricoides* of different ages (4-51) years old, sex and economic conditions. They received 15-30 ml of piperazine citrate (75mg/ kg) after 3 hours of light meal. Using the anthelmintic drug piperzine citrate only is not sufficient to expel the whole worms from the gut especially if there is a heavy infection, while using castor oil (after 24 hours from the administration of piperazine citrate) gave best results and there is no necessity for repeating piperazine citrate again.

Key words: Ascariasis, piperazine citrate and castor oil.

المستخلص:

شملت الدراسة 102 مريضاً مخمجين بداء الصفرّ الخراطيني تراوحت اعمارهم ما بين 4-51 سنة من الذكور والاثاث ومن مستويات معيشية متفاوتة ، حيث تمت معالجتهم بجرع مختلفه تراوحت من - 30 15 سم³ من عقار سترات البيرازين (75 ملغم/ كغم من وزن الجسم) بعد ثلاث ساعات من وجبة طعام خفيفه. لم يكن استخدام طارد الديدان وحده كافياً لطرده الديدان بصورة تامه من الامعاء بالاخص عندما تتواجد الديدان بأعداد كبيرة، في حين كان استخدام زيت الخروع بعد 24 ساعه من اعطاء سترات البيرازين هاماً واعطى نتائج جيده اغنت عن تكرار العلاج لطرده الديدان نهائياً من الامعاء.

Introduction:

Ascaris lumbricoides is one of the largest intestinal nematodes parasitizing man [1]. Piperazine citrate is considered as an alterantive therapy for ascariasis [2] and it is converted in *vivo* to hexahydrate [3,4], piperazine which causes paralysis of the parasite by blocking acetylcholine at the myoneural junction [5]. The other mode for expelling is mechanical action by using castor oil which is extracted from the castor plant *Ricinus communis* after purification seed oil from toxic protein (Recin)[6]. Castor oil had been used until recent time by Indian of North America as a therapy for ascariasis by mixing with chenopodium [7]. When castor oil is administered orally no change occurs in stomach but it is hydrolysed by intestinal lipase to liberate

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ricinoleic acid and glycerine, this acid is neutralized with alkaline medium of gut forming sodium carbonate and potassium ricinolate which produce intestine peristalsis, this leads to sweep the remaining castor oil in the gut before it can be hydrolysed and acts as a lubricant agent for gut [8,9]. The efforts tend to use it as anthelmintic therapy for *Ascaris lumbricoides* with mechanical action synergistic with pharmacological action of piperazine citrate.

Materials and methods :

A total of 102 infected patients with *Ascaris lumbricoides* of different sexes and with ages 4-51 years in Najaf city during the period of December 1988 to March 1991 have been examined and the infection was confirmed precisely through the direct microscopic examination and by sodium chloride flotation [10]. The infected patients were administered a dose of piperazine citrate* 15-30 ml with 75mg/ kg as a single dose (max. dose not exceed 3.5gm) [11], after a light meal. The worms were expelled during 24 hours from the administration of drug, the expelled worms were counted from 2-22 worms, collected in containers washed with tap water and fixed with ethanolic alcohol 70%, then their lengths were measured after worm with ruler. Castor oil * was administered to the same patients after 24 hours in a dose of 20 ml for children and 40 ml for adults

Results and Discussion:

The onset of castor oil for the residual (not expelling by piperazine citrate) was during a period of 30-120 minutes through 2-4 times of intestinal peristalsis. The worms of *Ascaris lumbricoides* were expelled completely from the gut. This was confirmed by the absence of the parasite eggs in the stool of the infected patients after 1-2 weeks from the administration of both drugs by direct microscopic examination or sodium chloride floatation of the parasite eggs a day per week. The results are summarized in fig. 1. The percentage of expelled worms from the gut by the action of piperazine citrate or castor oil is 58% and 40% respectively. The percentage of total expelled number by both drugs is 78% and 22% respectively. The percentage of expelled worms by piperazine citrate and castor oil with ages 15-51 years and 14-41 years are 58.4% and 41.6% respectively. The result of statistical analysis indicates no significant difference in expelling worms in both sex according to chi-square (χ^2) with value 3.5 in a degree of freedom equal to one and significance level 5%. The pregnant women patients with impaired liver function, patients with renal failure and patients with hypersensitivity to piperazine citrate and castor oil were excluded from this research. There are several effective anthelmintic such as piperazine citrate; pyrantel pamoate, mebendazole and levamisole which are characterized by the common action in paralyzing the worms and expelling them out of the gut. Piperazine citrate is cheap, active, and has no side effects. This drug can be given in a single dose. The fundamental purpose of this research is to measure the efficiency of piperazine citrate in eradication of *Ascaris lumbricoides* from the gut completely in the addition to another mode of deworming drug (castor oil) which has less side effects, simple abdominal pain and constipation after diarrhoea [7], available and cheap. The completion of deworming didn't occur in the first stage of therapy (piperazine citrate), but this was done by the usage of castor oil in the second stage of therapy, so the worms expelled in an interval discharge with each intestinal irritation

led to common expelling for male and female worms, because they have relatively equal weight and length.

The discharging of worms in the second stage of therapy may be due to their large size and occupies wide area in gut, moreover the worms have no ability to fix themselves

*product of the State Enterprise Drug Industries. Sammara Iraq.

*product of EVANS Company. London .England.

in the mucous membranc of the gut because of the absence of the hooklets, the compatability and coordination for both modes lead to find an integral condition that is the first therapy act to paralyse the worms by pharmacological action while the second therapy behaved as mechanical action. The unexpelling worms by the use of piperazine citrate may be due to excretion of 15-75% of the dose unchanged in

urine [12], this leads to reducing the activity of therapy to expel worms. The results in fig. 1 indicate that the expelling *Ascaris Iumbricoides* in the ages between 4-16 years didn't occure completely during the first stage of treatment (piperazine citrate), but was done after the second stage (castor oil), this may be due to the heavy infection in these ages. Piperazine citrate was more effective in expelling worms in age 5-51 years, this may be due to light infection (2 - 6 worms). There is no statistical significant difference in the percentage of expelled worms from both sexes and in the two modes of expelling.

Finally it appears that the use of the anthelmintic piperazine citrate in a single dose is not sufficient to expel all the *Ascaris Iumbricoides* worms parasitizing in a heavy infection, therefore using the mechanical mode of castor oil to get best result and not necessarily to repeat the piperazine citrate dose again.

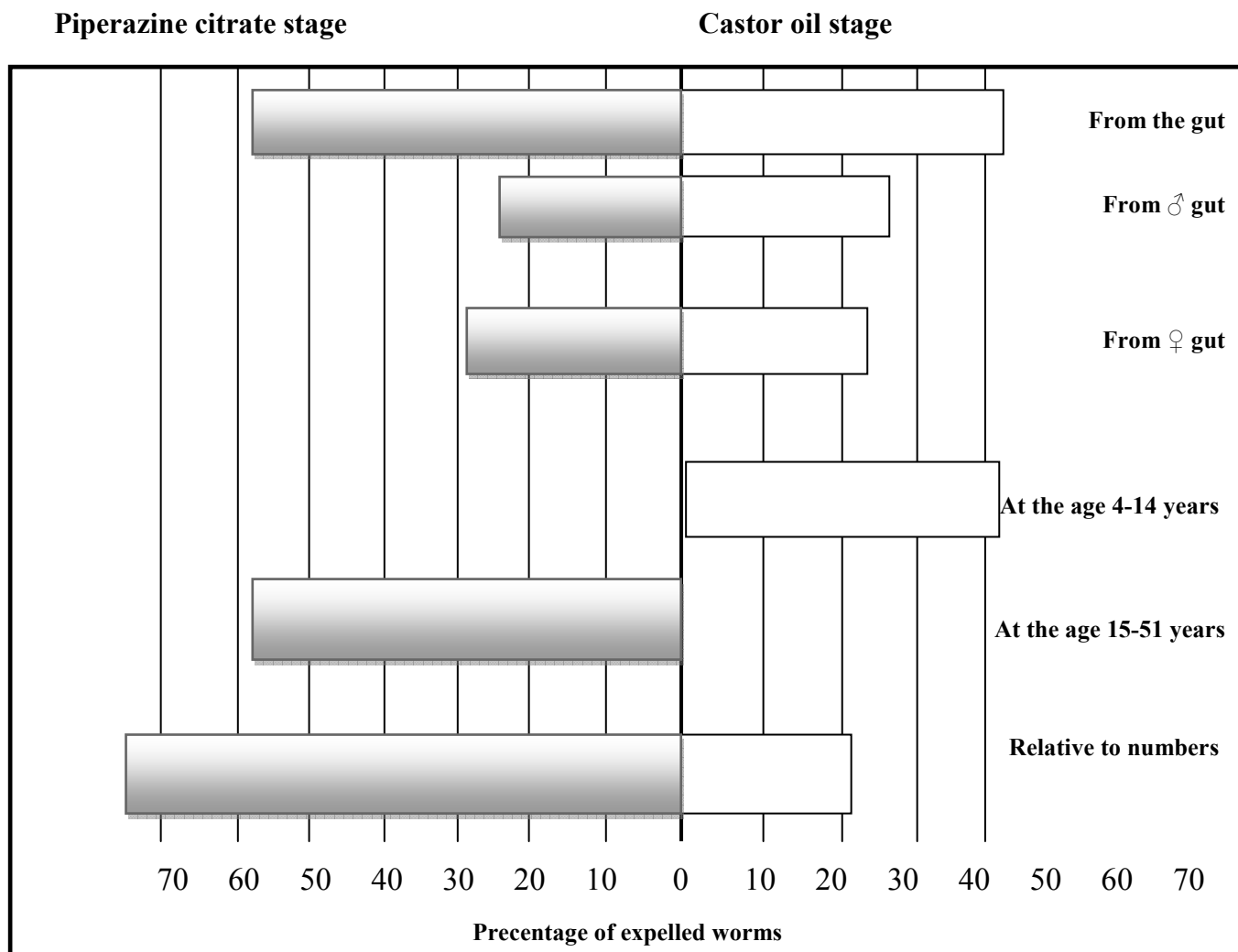


Fig. 1: represents the percentage of expelled *Ascaris lumbricoides* by piperazine citrate and castor oil in two stages.

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