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Some Haemtological Parameters In Mice Infection *Echinococcus Granulosus* And Treatment In Oxfendazole

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Abstract: Blood tests were conducted to calculate the differential count of white blood cells (lymphocytes, neutrophils, mononuclear cells and eosinophil cells) for groups of study mice infected with hydatid cysts treated with oxfendazole, oxfendazole + albendazole, oxfendazole + parasquintal and albendazole + parasquintal. The results indicated that the percentage of lymphocytes was the lowest in the OFZ and OFZ + PZQ treated groups than the other treated groups. And there was a clear decrease in the percentage of mononuclear cells in the treated mice, as well as a decrease in the percentage of eosinophilic cells after the first month of treatment.
Key word: Oxfendazole, *Echinococcus granulosus*, Lymphocyte, Neutrophil, Monocyteand Eosinophil.

بعض المعايير الدموية في الفئران المصابة بالاكياس العدرية والمعالجة بالاوكسفيندازول

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الخلاصة:
اجريت الاختبارات الدموية لحساب العد التفريقي لخلايا الدم البيض(الخلايا اللمفاوية، الخلايا العدلة، الخلايا احادية النواة والخلايا الحمضة) لمجاميع فئران الدراسة المصابة بالاكياس العدرية والمعالجة بالاوكسفيندازول، الاوكسفيندازول+ الالبندازول، الاوكسفيندازول+ البارازكوينتل والالبندازول + البارازكوينتل اشارت النتائج ان النسبة المئوية للخلايا اللمفاوية كانت الاقل في المجاميع المعاملةOFZ و OFZ+PZQ من المجاميع المعاملة الاخرى وتبين ان المجموعة المعاملة OFZ+PZQوOFZ كانت فيها النسبة المئوية للعدلات الاعلى مقارنة مع مجموعتي OFZ+ABZو .ABZ+PZQووجود انخفاض واضح في النسب المئوية للخلايا احادية النواة في الفئران المعاملة وايضا حصول انخفاض في النسب المئوية للخلايا الحمضة بعد الشهر الاول من المعاملة.
الكلمات الرئيسية: أوكسفيندازول، المشوكة الحبيبية، الخلايا الليمفاوية، العدلات، الوحيدات والحمضات.

Intoduction:

In view of the lack of previous studies conducted in Iraq on the use of a drug from benzimidazole derivatives, oxfendazole, and its use alone or in combination with another drug such as albendazole And Prazquentel are the two most used for the treatment of hydatid cysts. Given the importance of hydatid cyst disease from a health and veterinary standpoint, and the fact that the disease in Iraq is limited to the type E. granulosus, it was adopted to infect mice experimentally, as it is a good model similar to humans to study the growth and development of the parasite, in addition to its role in clarifying the relationship between the parasite and the host (Fotiadis et al., 1999).

Materials and Haematological tests

Blood tests were carried out after obtaining blood by cutting the tail of the mouse, by applying heat to the tail of the mouse and massaging it with the use of xylene and cutting the tail from the tip away from the body with sharp scissors, then collecting blood from the cut tail.

Collection of blood

Blood was drawn directly from the heart of experimental rats after anesthesia using a medical syringe with a volume of 1 ml and a 21-degree needle. The blood was collected in small sterile collection tubes (eppendrove), left for an hour at a temperature of 37 ° C. The thrombus was separated from the wall of the tube, and the samples were discarded in the central centrifuge. At a speed of 2000 rpm, serum was withdrawn from each mouse and placed in Eppendorf tubes and kept at -20°C until use.

Differential count of white blood cells

.Blood drops were obtained during the duration of the experiment to calculate the differential count of white blood cells in groups of study mice by making a cut in the tail of the mice. minutes to dry in the air, then fixed the swab with absolute methyl alcohol for 30 seconds, then placed in Leishman stain, left for 15 minutes, washed with running water slowly, placed on a stand at an angle for the purpose of drying, and examined under a microscope using a 100X oil lens. 100 white blood cells were counted. Repeat the count three times for one mouse. The percentage of each type of cell was calculated, just as the number of each type was calculated (Sood, 1987).

Result Differential count of white blood cells in treated mice :

Lymphocytes

Figure 1 indicates the lymphocyte count in OFZ, OFZ+PZQ, OFZ+ABZ and ABZ+PZQ treated mice after the first month of infection with primary capita. The percentage of lymphocytes ranged between the lowest percentage of 24.0% and the highest percentage of 59.2% for mice treated with OFZ + PZQ and ABZ + PZQ, compared to the two groups of negative control (40.5%) and positive control (60%). And the rate of lymphocytes rose after the second month of treatment between The lowest percentage was 23.8% and the highest percentage was 65.2% in the OFZ+PZQ and OFZ+ABZ treated groups compared to the negative (38.4%) and positive (61.2%) control groups. The percentage of lymphocytes increased after the third month of treatment between 26% - 57.6% in groups treated with OFZ and OFZ + ABZ, compared with the negative (39.4%) and positive (63.5%) control groups. In the fourth month of treatment,

the percentage of lymphocytes ranged between 31%-71.5% in the OFZ+PZQ and OFZ+ABZ treated groups, respectively, compared with the negative (41.4%) and positive (67%) control groups. The results shown in Figure-1 indicated that the percentage of lymphocytes was the lowest in the OFZ and OFZ + PZQ treated groups than the other treated groups.
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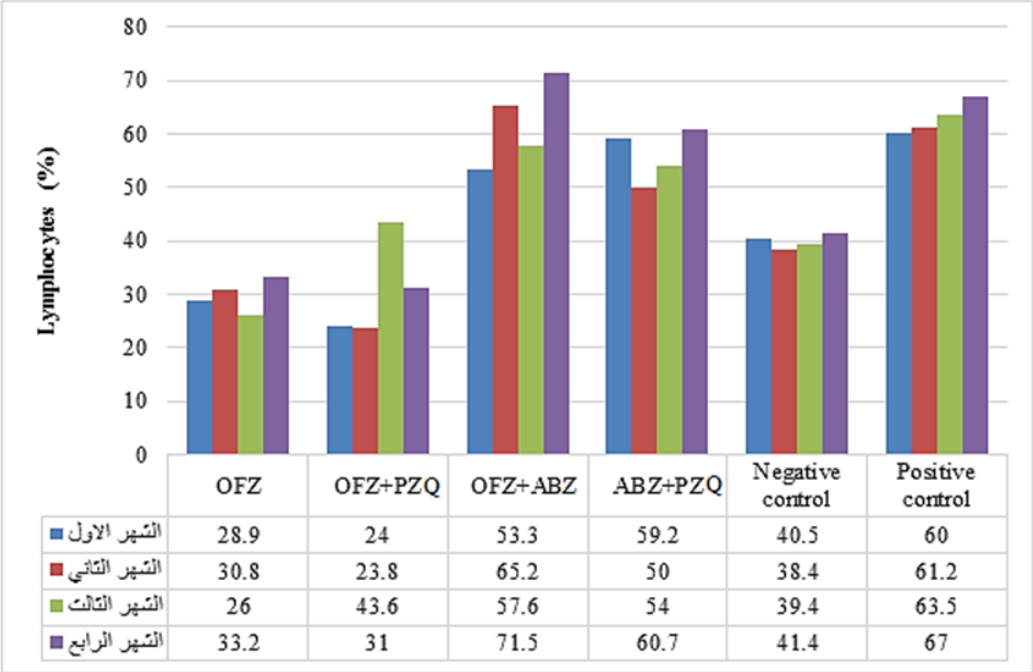


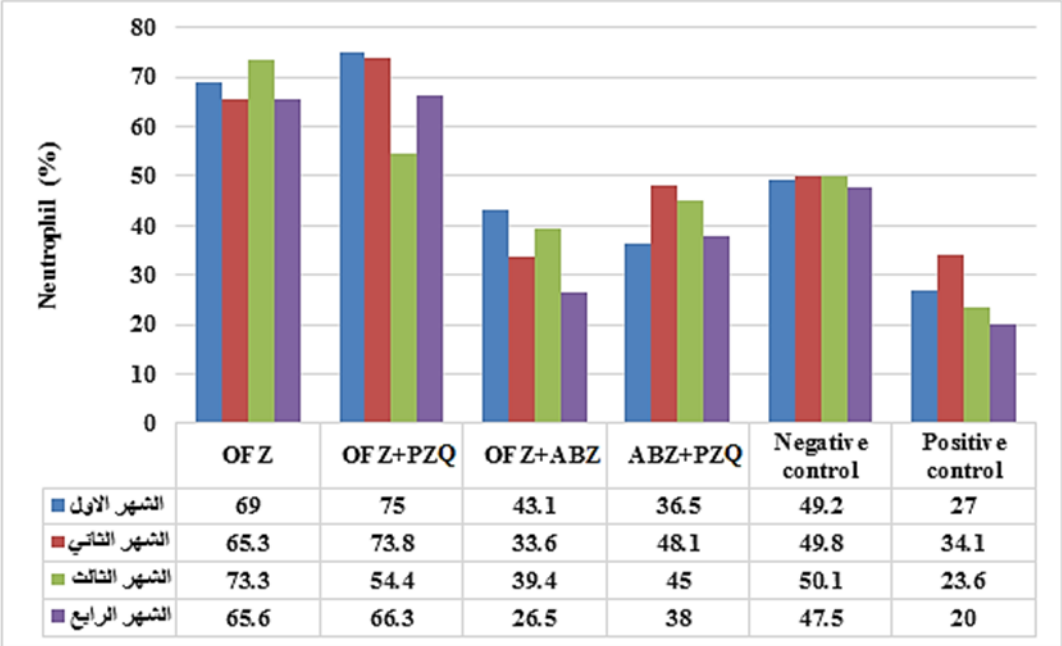
	OFZ	OFZ+PZQ	OFZ+ABZ	ABZ+PZQ	Negative control	Positive control
الشهر الاول	28.9	24	53.3	59.2	40.5	60
الشهر الثاني	30.8	23.8	65.2	50	38.4	61.2
الشهر الثالث	26	43.6	57.6	54	39.4	63.5
الشهر الرابع	33.2	31	71.5	60.7	41.4	67

Figure 1: Percentage of lymphocytes in mice treated for four months, and compared with control mice

Neutrophil cells

Figure 2 shows a decrease in the percentage of neutrophils after the first month of infection with primary heads, and it almost decreased from the first month of treatment, as it ranged between the lowest percentage of 36.5% and the highest percentage of 75% in the groups treated with ABZ + PZQ and OFZ + PZQ on respectively, compared with the negative (49.2%) and positive (27%) control groups. In the second month of treatment, the percentage of neutrophils ranged between 33.6% and 73.8% in the OFZ+ABZ and OFZ+PZQ treated groups, compared with the negative (49.8%) and positive (34.1%) control groups The percentage of neutrophils decreased in OFZ+ABZ and ABZ+PZQ groups for the third month of treatment compared with the negative control group (50.1%) and the positive control group (23.6%). In the fourth month, neutrophils varied between 26.5% and 66.3% in the OFZ+ABZ and OFZ+PZQ treated groups, compared with the negative control groups (47.5%) and the positive control (20%). It was found from the results described in Figure-6 that the OFZ+PZQ

treated group And OFZ had the highest percentage of neutrophils compared with groups of OFZ + ABZ and ABZ + PZQ.



	OFZ	OFZ+PZQ	OFZ+ABZ	ABZ+PZQ	Negative control	Positive control
الشهر الاول	69	75	43.1	36.5	49.2	27
الشهر الثاني	65.3	73.8	33.6	48.1	49.8	34.1
الشهر الثالث	73.3	54.4	39.4	45	50.1	23.6
الشهر الرابع	65.6	66.3	26.5	38	47.5	20

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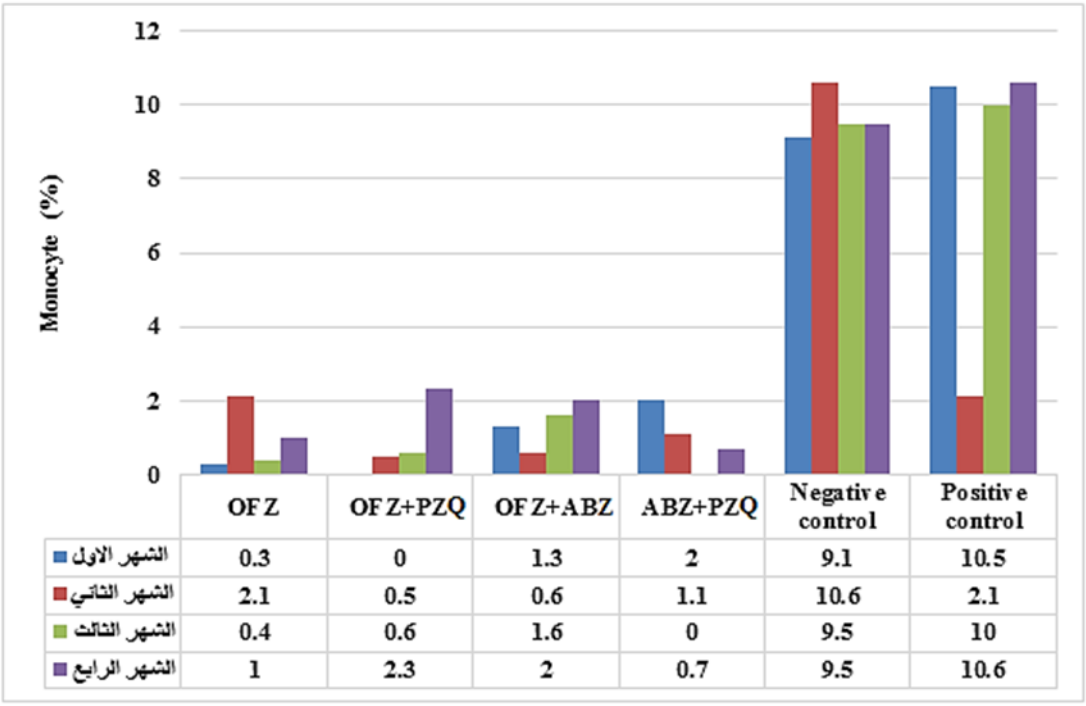
Figure 2: The percentage of neutrophil cells in mice treated for four months compared to control mice.

mononuclear cells

Figure 3 shows a clear decrease in the percentage of mononuclear cells in the mice treated with OFZ, OFZ+ABZ, OFZ+PZQ, and ABZ+PZQ in the first month of treatment, as it varied between 0.0% and 2.0% in the groups treated with OFZ+PZQ and ABZ+PZQ, compared with The negative (9.1%) and positive (10.5%) control groups. The percentages of mononuclear cells in the second month of treatment varied between 0.5% -2.1% in the OFZ + PZQ and OFZ groups, compared with the negative (10.6%) and positive (2.1%) control groups. The percentage of mononuclear cells decreased for the third month And fourth, for all treated rat groups.

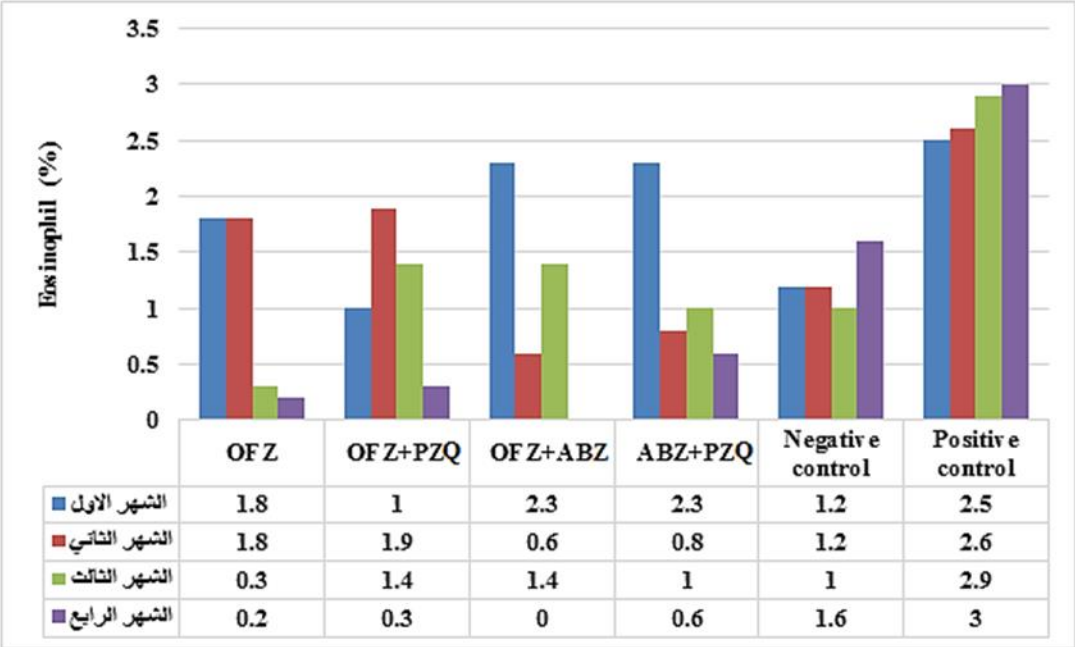


	OFZ	OFZ+PZQ	OFZ+ABZ	ABZ+PZQ	Negative control	Positive control
الشهر الاول	0.3	0	1.3	2	9.1	10.5
الشهر الثاني	2.1	0.5	0.6	1.1	10.6	2.1
الشهر الثالث	0.4	0.6	1.6	0	9.5	10
الشهر الرابع	1	2.3	2	0.7	9.5	10.6

Figure 3: The percentage of mononuclear cells in mice treated for four months compared to control mice.

Acidophilic cells

Figure 4 shows a decrease in the percentage of eosinophil cells after the first month of treatment, as it varied between 1%-2.3% in the treatment groups OFZ+PZQ, OFZ+ABZ, and ABZ+PZQ, compared with the negative (1.2%) and positive (2.5%) control groups. In the second month, it decreased between 0.6% and 1.9% in the OFZ+ABZ and OFZ+PZQ treated groups compared to the negative (1.2%) and positive (2.6%) control groups. In the third month, the percentages ranged Eosinophil cells ranged between 0.3%-1.4% in OFZ and OFZ+PZQ treated groups, as well as OFZ+ABZ, compared with the negative (1%) and positive (2.9%) control groups. The percentage of eosinophilic cells recorded a clear decrease for the treated groups in the fourth month, between 0.0% -0.6% for the OFZ + ABZ and ABZ + PZQ treated groups, compared with the positive control group, which recorded the highest percentage (3.0%).



	OFZ	OFZ+PZQ	OFZ+ABZ	ABZ+PZQ	Negative control	Positive control
الشهر الاول	1.8	1	2.3	2.3	1.2	2.5
الشهر الثاني	1.8	1.9	0.6	0.8	1.2	2.6
الشهر الثالث	0.3	1.4	1.4	1	1	2.9
الشهر الرابع	0.2	0.3	0	0.6	1.6	3

. Figure 4: Percentage of eosinophilic cells in mice treated for four months compared to control mice.

Discussion

The results of the differential count of white blood cells showed a significant increase in the number of lymphocytes with a variation in the number of mononuclear cells and a decrease in the number of neutrophil cells in the immunized mice dosed with antioxidants as shown in Table 4-1, as the increase in the number of lymphocytes is due to the fact that immunization and antibiotics Oxidative stress is an efficient determinant of B lymphocytes (Al-Taei, 1996; Mannoor et al., 2008). The decrease in neutrophils in the blood of mice may be due to their migration and depletion by phagocytosis and their role in influencing the antibody dependent cell mediated cytotoxicity (ADCC), which is a characteristic of the host defense mechanisms against parasites (Roitt et al., 2001).

As for mononuclear cells, the current study showed a discrepancy in their numbers, and this change may be explained by the division of mononuclear cells and then an increase in their numbers in the peripheral blood of experimental mice with the migration of some of them, as mononuclear cells represent the main source of macrophages, and thus they represent the bulk of the mechanisms Non-specific defense of the host. The increase in the number of mononuclear cells can also be explained by the fact that the immune specificity is established when the antigen is treated and presented, which leads to a wide

stimulation in the groups of immune cells to recognize the foreign body that has reached it, and maintains this immune specificity by producing cells T and B memory cycles continue long after the antigen has disappeared.

In the current study, it was observed that the numbers of eosinophil cells fluctuated, and this fluctuation is explained by the migration of a part of these cells to the sites of presence of antigens with the compensation of the peripheral circulation with new numbers added to it. In their numbers in the peripheral blood (Ali-khan, 1974) peripheral blood, and that the high levels of eosinophil cells is a natural matter that results from their sensitivity to the parasite antigens that were injected into the animal's body, which led to a multiplication of their numbers in the peripheral blood; Carvalho et al., 2009) Kreider et al., 2009 al., 2007). Eosinophil cells are more sensitive to parasite antigens than other white blood cells in infected people (Wardlaw and Ky, 2001), and that an increase in lymphocytes accompanied by a decrease in neutrophils or vice versa, is nothing but a balancing process between the number of immune cells (Delves et al. , 2006).

As for the differential count of white blood cells in mice treated for a period of four months, there is a discrepancy in the percentages of white blood cell types in the peripheral blood of treated mice, especially the number of neutrophils and lymphocytes. For neutrophils and lymphocytes decrease compared with positive control group mice. This result was observed by Sida (2005) when using chemotherapy for mice infected with hydatid cysts, it was noted in the treatment groups OFZ + ABZ and ABZ + PZQ The average percentage of lymphocytes and mononuclear cells and a significant decrease in the average percentage of neutrophils (Fig. 4-3,4-4, 4-5) These results were reinforced by Mannoor et al. (2008) and Moraitaki et al. (2010) the reduction of neutrophils in the blood of mice may be due to migration to sites of injury by the execution of chemotaxis mechanisms mediated by C5a and the cytokinesis macrophage inflammatory protein-2 (MIP-2) produced by rat macrophage cells (which is analogous to IL-8). in humans). Then the neutrophils attack the infection agents for the purpose of phagocytosis, but they also die during the fulfillment of their phagocytic function (Roitt et al., 2001)) The increase in the number of lymphocytes was reflected in the increase in lymphocyte proliferation as well as the stimulation of bone marrow lymphocytes, macrophages and T cells, and this is consistent with what was found by Reuben et al. (1979) when activating chelating coelom macrophages by BCG (Bacillus Calmette-Guérin) vaccine, which reversed an increase in the number of lymphocytes and the secretion of colony-stimulating factor (CSF) The current study is consistent with the studies of (Ali (2000) and Khalaf (2013) who recorded an increase in the numbers of lymphocytes and a decrease in neutrophils. This indicates that the treated groups possess primary capsid antigens that are efficient cleaved

antigens for T and B lymphocytes, and then increase their numbers and decrease their numbers Neutrophil cells, due to their migration to the places of presence of the parasite.As for the reason for the change occurring in mononuclear cells and eosinophil cells, it is due to the same reasons mentioned previously, Figure (4-5, 4-6).

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