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EFFICACY OF SOME DRUGS AND PATHOLOGICAL STUDIES ON TOXOPLASMA GONDII INFECTION IN MICE

Amany M. J. Al-Kaysi;*Gehan A. Hosny; *Gehan Gamil; Al-Bakri, N.A. and **Eid R. A. A.

College of Medical and Health Technology, Baghdad.
* Dept of Pathology, Animal Health Research institute, Dokki
Bology college of education,Baghdad uni.
** Dept of Parasitology, Animal Health Research institute. Dokki

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SUMMARY

The present investigation was conducted to study the effect of infection with Toxoplasma gondii and the efficacy of azithromycin and garlic tablets on treatment of acute murine toxoplasmosis in addition to study the histopathological changes due to infection. For this purpose, sixty Albino mice were used as experimental animals that equally divided into 6 groups. Estimation of survival rate, pathological studies, bioassay trial and immunofluorescent study were performed for each group of mice. High efficacy of azithromycin at a dose of 250 mg/kg/day on infected mice was shown, that increased survival rate (90% at the 7th day P.I) and decreased the histopathological changes when compared with control groups. Garlic tablets at a dose of 500 mg/kg/day showed fewer efficacies in infected mice, survival rate (40% at the 6th and 7th day P.I) which was lesser than those groups treated with azithromycin. Pathologically, group treated with azithromycin showed improvement in histological pictures compared with group treated with garlic.

To identify the efficacy of the drug, at the end of the experiment, subinoculation of healthy mice by visceral and brain suspensions from surviving mice treated with azithromycin or garlic was performed as compared with subinoculation of suspension of brain and visceral of infected non treated mice inoculated into healthy mice, that showed death of these mice after three days post-infection (survival rate 0 %).

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It was concluded that azithromycin has a significant effect in treatment of murine model toxoplasmosis, but it did not eradicate the parasite completely as few cysts remained in the brain, while garlic tablets had a limited effect for treating toxoplasmosis.

INTRODUCTION

Toxoplasma gondii: is a coccidian parasite of felids with human and other warm–blooded animals as alternative hosts (Degerli et al., 2003). Human infection generally occurs through the ingestion of raw or undercooked meat that contains tissue cyst of the parasite or through the ingestion of water or food contaminated with sporulated oocysts and congenitally through transplacental transmission from mother who acquired her infection during gestation (Abudullah et al., 1994). The organism recovered in tissue sections and body fluids have identical morphologic characteristic of tachyzoites, pseudocyst and bradyzoites but in cell cultures only tachyzoites are seen (Gutierrz., 1990). Experimental infections of animals with Toxoplasma were considered to be an important tool in the study of the effect of the parasitic invasion inside the animal body. Recently, many studies were carried out on experimental animals to evaluate the drugs effect in prophylaxis and treatment of toxoplasmosis. Some investigators searched for safe and effective drugs to be used for the treatment of toxoplasmosis in pregnant women and infant. Mice were experimentally infected with T. gondii and the effects of these drugs were studied in vitro and in vivo to achieve the best results for application (Dagc and Aksuner, 2003).

The present study was carried out to give a spot light on the effect of some drugs used for the treatment of toxoplasmosis in murine models in addition to study histopathological changes due to infection.

MATERIAL AND METHODS

A - Material:

A-1. Experimental animals:

1) 90 Albino mice 4-5 weeks old, of 17-22 g weight and parasites-free were used as experimental animals; they were used for maintaining Toxoplasma strain, histopathological and immunofluorescent studies

B) Three rabbits about 1 kg weight were used for the preparation of polyclonal antiserum for immunofluorescent studies.

A-2. Preparation of Toxoplasma RH strain :

The maintenance of Toxoplasma strain :

This virulent strain was originally isolated from a cephalitic child in the USA by (Sabin, 1941). It is maintained by peritoneal inoculation of Swiss Albino mice. The

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infected mice then was killed within three days post infection. Calculation of the parasites in one ml of peritoneal exudates was made by using improved neubour chamber. Healthy mice were regularly inoculated intraperitoneally with 1 X 10^4 organisms at a dose of 0.1 ml by tuberculin syringes to induce acute infection by Toxoplasma RH strain, this strain was also used to prepare hyperimmune serum (Conly et al., 1981).

A-3. Preparation of Toxoplasma antisera :

Toxoplasma rabbit antisera (primary polyclonal antibodies) were obtained according to Alan and Robin (1988) procedure for the immunoflurescent technique

B - Methods :

B-1. Expiremental Design :

To study the effect of the acute Toxoplasma infection and the efficacy of azithromycin and garlic tablet on these albino mice, sixty mice were used for this purpose divided into 6 groups, each composed of 10 animals as follows:

- Group 1: Non infected, non treated mice (negative control).
- Group 2: Infected with 1 x 10^4 *Toxoplasma* tachyzoites, none treated mice (positive control).
- Group 3: Infected with 1 x 10^4 *Toxoplasma* tachyzoites and orally treated mice with azithromycin in a dose of 250 mg/kg/day for 3days. (Moshkani and Dalmi, 2000).
- Group 4: Non infected and orally treated mice with azithromycin in a dose of 250 mg/kg/day for 3days.
- Group 5: Infected with 1 x 10^4 Toxoplasma tachyzoites and orally treated with garlic tablets in a dose of 500 mg/kg/day for 7days.
- Group 6: Non-infected and orally treated with garlic tablets in a dose of 500 mg/kg/day for 7 (Khoshazaba et al., 2007).

The experiment extended for 10 days post-infection.

B- 2. Survival Rate:

It was calculated in each group according to the following ratio (Eid et al., 2004):

$$\text{Survival rate} = \frac{\text{No. of animal survived}}{\text{Total No. of animals}}$$

B- 3. Pathological Study:

Pathological studies, smears from peritoneal exudates were taken from all groups and stained with Giemsa to detect the presence of the parasite. Postmorteum examination was performed and macropathological changes were recorded. Samples from brain, liver and spleen were preserved in 10% neutral buffer formalin then processed and embedded in paraffin , sections of 4-5micron thickness were obtain and stained for H&E, PAS stain and Prussian blue (Clayden, 1971 and Bancroft et al., 1994).

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B- 4. Bioassay Trial:

Mice were dissected and subinoculation of brain and viscera suspension were made from infected non treated group immediately after death and from surviving mice that were treated with azithromycin into healthy mice at the end of the experiment (10 days).

The method includes removal of brains and viscera from the survived treated mice with azithromycin, suspended in PBS (pH = 7.2), then inoculated intraperitoneally at a dose of 0.1 ml into 6 healthy mice, brain and viscera of infected non treated mice were also suspended in PBS, pH = 7.2 then inoculated intraperitoneally at a dose of 0.1 ml into 6 healthy mice (Mcleod et al., 1988).

Survival rate of each group was calculated according to a ratio mentioned above.

B- 5. Immunofluorescent Study :

Indirect immunofluorescent technique was carried out on paraffin embedded tissues sections from all groups (from the dead and survived mice till the end of the experimental period) to detect Toxoplasma antigen in the infected tissues according to Matossian (1977) procedure. To localize the binding of primary specific antibody with antigen in tissue section, conjugated antiserum with Fluorescein isothiocyanate was used.

RESULTS

1. Survival Rate :

As shown in table 1 and Fig. 1, it was found that azithromycin at a dose of 250 mg/ kg / day in group 3 (infected, treated mice) increased the survival rate as it was 100 % from the 1st to the 6th day post infection (PI) then it was gradually declined (90%,70%,50% and 20%, respectively) from the 7th to the 10th day PI as compared with group 2 (infected and non-treated group) which had a rate of 100% from the 1st to the 4th day PI then it was 0% after the 4th day. The survival rate of group 5 (infected mice treated with garlic) was 100% from the 1st to the 4th day PI then began to decline to reach 90, 40 and 0 % at the 5th, 6th and 7th as well as 8th days PI, respectively.

2. Pathological Findings :

Impression smears stained with Giemsa of peritoneal exudates of infected non treated mice showed aggregation of tachyzoites in exudates of these infected mice (Fig. 2).

The macropathological examination of group 2 (positive control), were represented by severe congestion and multiple petechial hemorrhages in most of internal organs specially brain, liver and spleen. Hemorrhages were recognized on the meningeal surface of cerebrum in all of these infected mice. Multiple irregular pale foci were observed on

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the surface of the liver and also in cut section. While, the micropathological examination of group 3 (infected treated mice with azithromycin) showed mild to moderate congestion in the internal organs. Few pale areas were seen on the surface of the liver in two mice of this group. Other macropathological lesions were observed in group 5 (infected treated mice with garlic tablet) represented by severe congestion and haemorrhage in the internal organs.

Histopathological examination of Group 2 (infected non treated mice):

A- Brain:

The lesions in brain varies from small focal areas of necrosis and mononuclear cell infiltration, to large areas of necrosis and calcification. Occlusion of some blood vessels with thrombus formation other vessels showed vacuolation and hyalinization of their walls (Fig. 3a&b). Large number of macrophages laden with hemosidrin pigment were seen in most of the necrosed areas (Fig. 4a,b&c).

B- Liver:

Examination of the liver revealed that hepatic vessels were widely dilated and engorged with blood with perivascular inflammatory infiltration, multiple defined necrotic foci, associated with inflammatory cells infiltrates (Fig. 5a&b).

C- Spleen:

The spleen revealed marked depletion in number of lymphocytes (Fig. 5c) with hyperplasia of megakaryocytes, edoma and hemolysed blood.

Histopathological examination of Group 3 (infected and treated mice with azithromycin):

A-Brain:

The main microscopical lesions in brain revealed few focal areas of micronecrosis with inflammatory and glial cells infiltrations. Also, there was Toxoplasma cyst without inflammatory reaction (Fig. 6a).

B- Liver:

The liver revealed mild congestion of blood vessels with few areas of necrosis and polymorphonuclear cells aggregation (Fig. 6b).

C- Spleen:

The spleen showed lymphocytic hyperplasia in the splenic corpuscles. The splenic sinusoids were dilated and contained lymphocytes and monocytes .

Histopathological examination of group 4 (non-infected and received azithromycin) demonstrated: no marked histopathological changes in the internal organs

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Histopathological examination of group 5 (infected and treated with garlic):

A- Brain:

The brain showed focal areas of necrosis with aggregation of inflammatory cells (mainly neutrophils) and glial cells (Fig. 7a). Focal areas of encephalomalecia were also seen.

B- Liver:

The liver revealed congestion of hepatic blood vessels and sinusoides with the presence of multiple scattered areas of haemorrhages. The hepatic parenchyma showed multiple foci of necrosis with infiltration of inflammatory cells. The hepatocytes exhibited variable degenerative changes (Fig. 7b).

C- Spleen:

The spleen revealed moderate hyperplasia of lymphocytes in the splenic corpuscles

3. Bioassay Trial Findings:

The bioassay trial findings revealed no symptoms of infection and no marked macropathological changes in the internal organs of the healthy mice received subinoculation of brain tissues and visceral suspension of the infected and treated group with azithromycin. The survival rate was 100% as compared with subinoculation of brain tissues and visceral suspension of infected non treated group into healthy mice, the inoculated mice were died at the end of the third day post infection, and the survival rate was 0%.

Different macropathological changes were observed in this group including severe congestion and multiple petechial hemorrhages in most of internal organs.

4. Immuofluorescent Studies:

Toxoplasma antigen showed marked fluorescent reaction through the meningis and in the wall of blood vessels of brain in mice of group 2 (infected non treated mice), and less in brain tissues of group 3 (infected and treated with azithromycin)

The antigen of the parasite in the liver of group 2 showed fluorescent reaction within the liver parenchyma while, the reaction was less in liver of group 3.

Spleen of all groups showed antigen reaction, but it was higher in group 2. (Fig. 8a,b,c&d).

DISCUSSION.

Bao et al. (1994) studied the histopathological changes in mice experimentally infected with a virulent strain of Toxoplasma infection; they found that all infected mice had many changes all over the body specially liver. They decided that extensive lesion and diffuse necrosis of liver cells were the main cause for sudden death of the infected mice while acute and retrograde

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degeneration in kidneys, lungs and brain were important factors leading to death of the mice.

Khan et al. (1999); Mui et al. (2005) and Zhang et al. (2006) tried to find a safe and effective drugs to be used in treatment of toxoplasmosis and evaluated the efficacy of these drugs on experimental animals.

Azithromycin is a very powerful antibiotic widely used for many conditions such as toxoplasmosis and other parasitic infection (Glade and Snider, 1990 and Degerli et al., 2003).

The present study was designed to use azithromycin in treatment of murine model toxoplasmosis compared with garlic tablets. Although azithromycin doubled the survival time of these treated infected mice compared with positive control group which died at the end of fourth day post infection but, it did not eradicate the infection completely from the brain and viscera of these experimental animals as tissue cyst was detected in brain sections of the infected, treated mice. The results indicated the presence of chronic infection which was in agreement with those documented by Moshkani and Dalimi (2000). In this respect Sadak et al. (1999) and Tabbara et al. (2005) studied the efficacy of azithromycin against experimental toxoplasmosis; they observed improvement of pathological changes of the infected organs with reduction of the tachyzoites counts and increase in the survival rate of treated mice. Moshkani and Dalmi (2000) studied the efficacy of atovaquone alone or in combination with azithromycin against tissue cysts of toxoplasmosis and they suggested that these drugs together may be effective in removing of tissue cysts from infected tissue of mice.

Garlic (Allium sativum) was recognized since ancient Egyption (Colorni et al., 1998). Garlic has immune modulator effect on infected tissues with toxoplasmosis (Colorni et al., 1998 and Buchmann et al., 2003). The report of Kumar and Berwal (1998) described the ability of garlic to strengthen the body's natural defense against infection by activating phagocytes B-cells and T-cells, all three levels of the cellular immune system. It is a broad spectrum antibiotic that would kill a wide variety of bacteria, fungi and parasite.

The results of the present study found a little effect of garlic tablets in treatment of toxoplasmosis which was disagree with those of Khoshazaba et al. (2007) who found that garlic tablet when administrated to healthy mice inoculated with 1 x 10^6 Toxoplasma tachyzoites, the infection eradicated completely from brain, liver and spleen of these mice.

Colorni et al. (1998) documented that commercial powders have limited effects against toxoplasmosis , this is in agreement with the result of the present study which

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might be due to the instability of allicin and prone to breakdown in a relatively short time (Ankri and Mirelman, 1999).

Macropathological examination of the present work in infected non treated mice showed severe congestion and multiple petechial hemorrhages in brain, liver and spleen which were in agreement with those found by Eid et al., (2004). Azithromycin reduced congestion and hemorrhage in most internal organs of mice which indicates infection recovery (Gutierrz, 1990). Histopathological studies evident marked improvement in the pathological changes treated with azithromycin, which was expressed in the presence of the foci of micronecrosis with infiltration of few inflammatory cells. Hyperplasia in the number of lymphocytes in the splenic corpuscles which could be attributed to the enhancement of cell mediated immunity also examination of the liver revealed improvement in the pathological picture as compared with the infected control group.

The multiple necrotic changes recognized in brain, liver and spleen in the infected non treated group were due to the intracellular growth of tachyzoites as mentioned by Shalaby et al. (1993).

McGavin et al. (2001) attributed necrotic changes in lymphocytes of infected non treated mice group that Toxoplasma have the ability to lyse the infected cells and causes tissue damage.

In the present study, the presence of microscopic nodules of cellular infiltrates in the brain tissue are the earliest reaction of Toxoplasma infection in the central nervous system which consist of aggregations of microglial cells (Gutierrz, 1990). The reasons for the presence of tissue cysts in the brain of treated mice with azithromycin were in agreement with Dubey (1998) who mentioned that his tissue cyst formation had occurred after the host has acquired immunity.

Cox et al. (2005) mentioned that by time of tissue cyst forming, the inflammation began to subside

Demonstration of T.gondii parasitic antigen in the present study by immunofluorescent techniques in tissues of infected untreated mice were in agreement with that recorded by Amin (1980) who observed presence of the organism in tissue sections of infected mice with Toxoplasma RH strain.

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Table(1): The survival rate of mice according to each group parameter

Group parameter	1st day	2nd day	3rd day	4th day	5th day	6th day	7th day	8th day	9th day	10th day
Infected & non treated(G2)	10/10 100%	10/10 100%	10/10 100%	10/10 100%	0/10 0%	0/10 0%	0/10 0%	0/10 0%	0/10 0%	0/10 0%
Non Infected & non treated(G1)	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%
Infected treated with Azithromycin (G3)	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	9/10 90%	7/10 70%	5/10 50%	2/10 20%
Non Infected & treated with Azithromycin (G4)	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%
Infected & treated with garlic tablets (G5)	10/10 100%	10/10 100%	10/10 100%	10/10 100%	9/10 90%	4/10 40%	4/10 40%	0/10 0%	0/10 0%	0/10 0%
Non Infected & treated with garlic tablets (G6)	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%	10/10 100%

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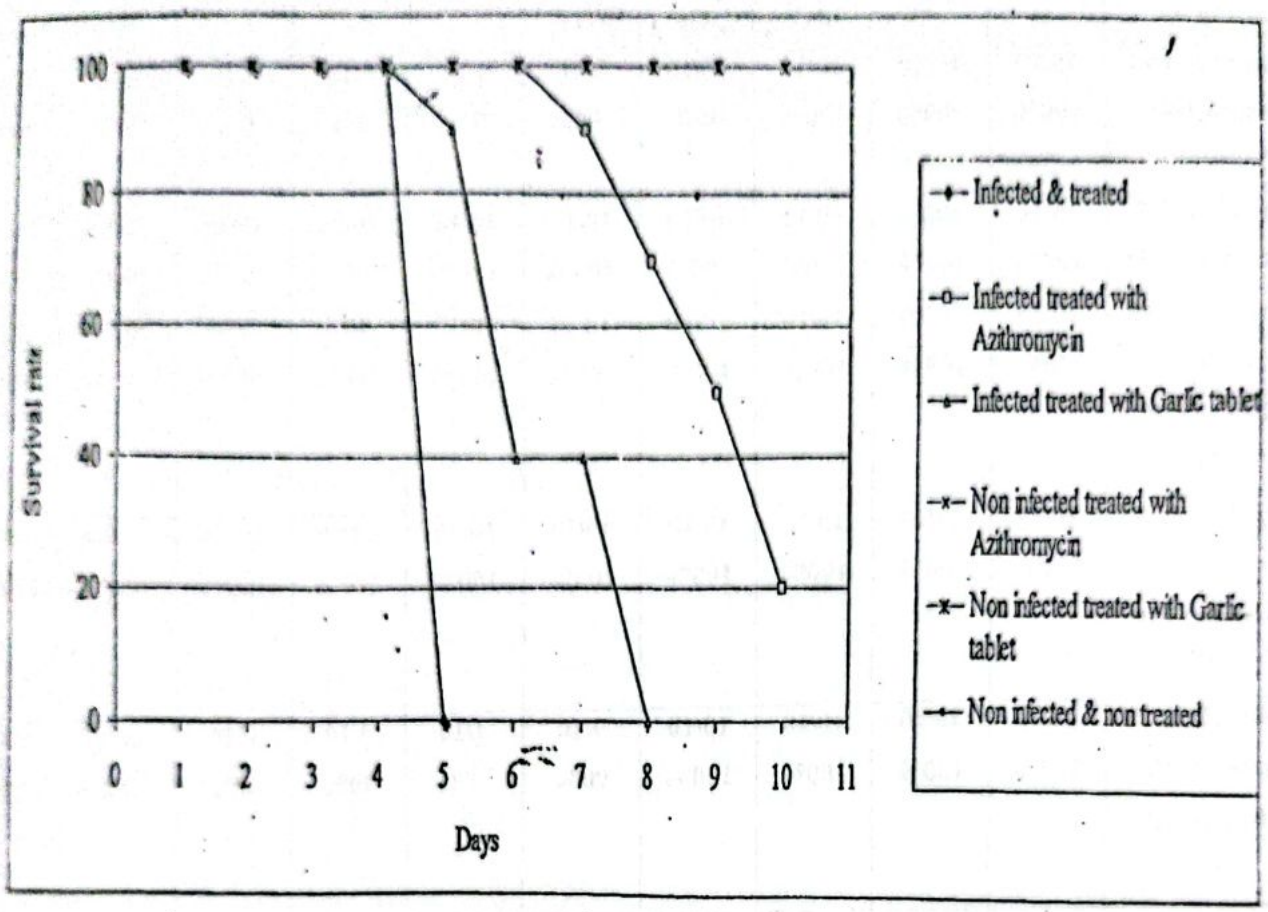

Fig. (1): Survival rate of mice according to each group parameter

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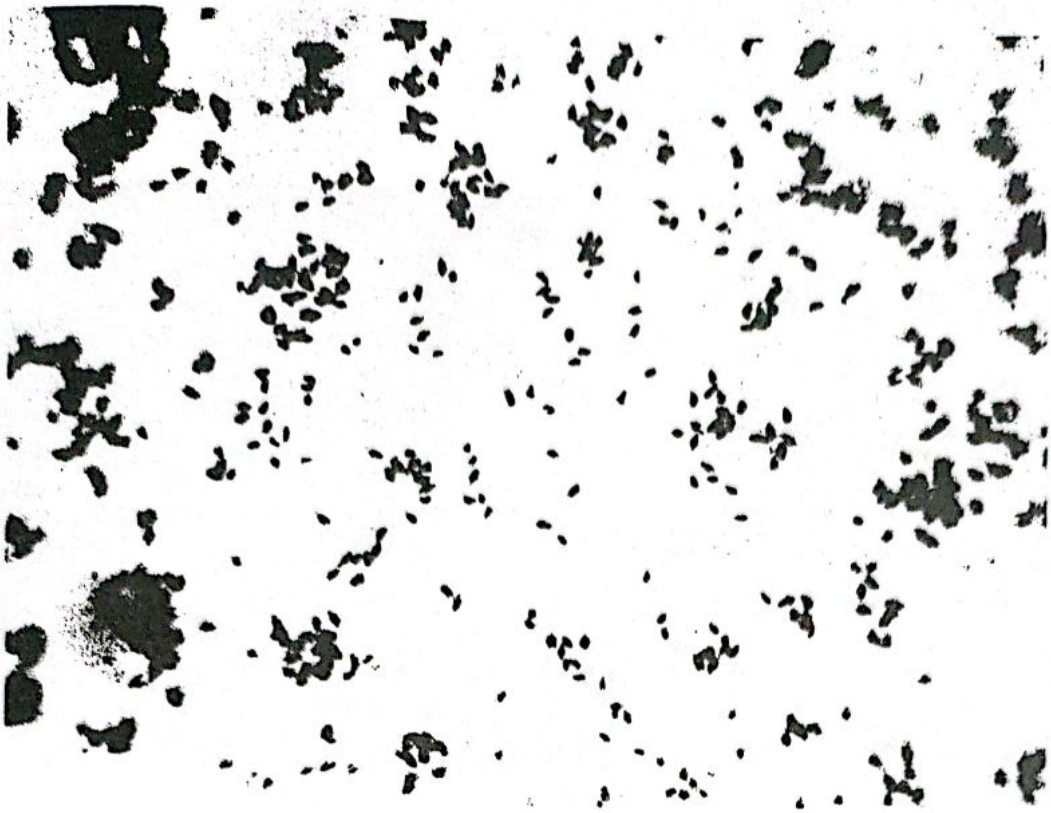

Fig. (2): Impression smears of peritoneal exudates of infected mice revealing *toxoplasma* tachyzoites (Giemas stain X 600).

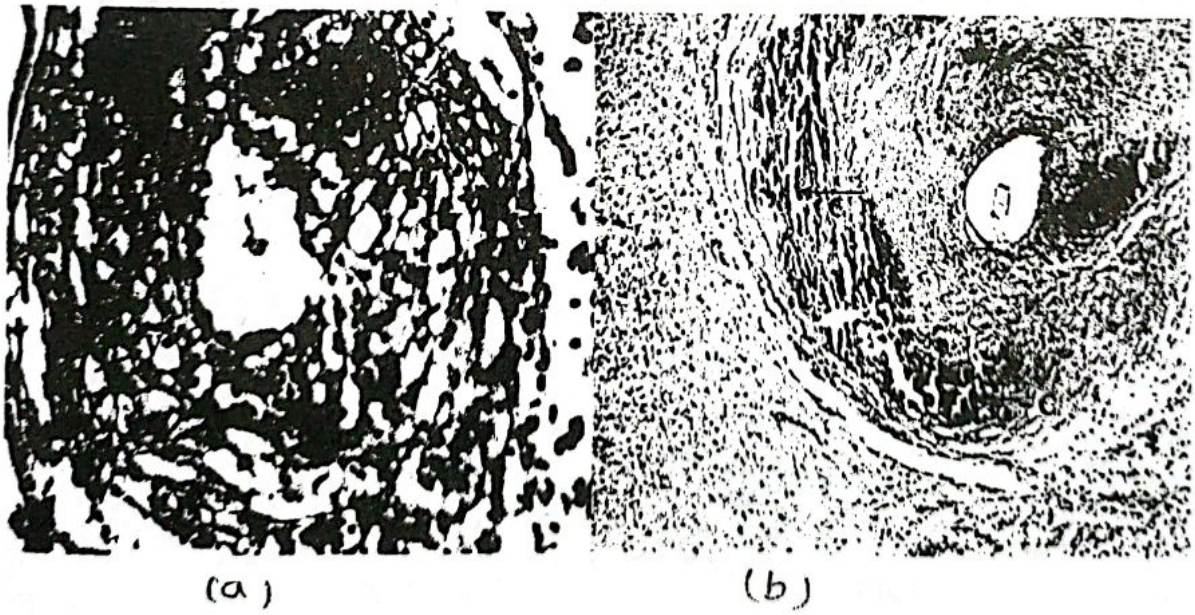

Fig. (3: a&b): a) Photomicrograph of brain of mice group 2 revealing vacuolation in tunica media, hyalinization in the wall of blood vessels and vasculitis. (H&E X 400). b) Photomicrograph from brain of group 2 demonstrating large focal area of necrosis and calcification. (H&E X 200).

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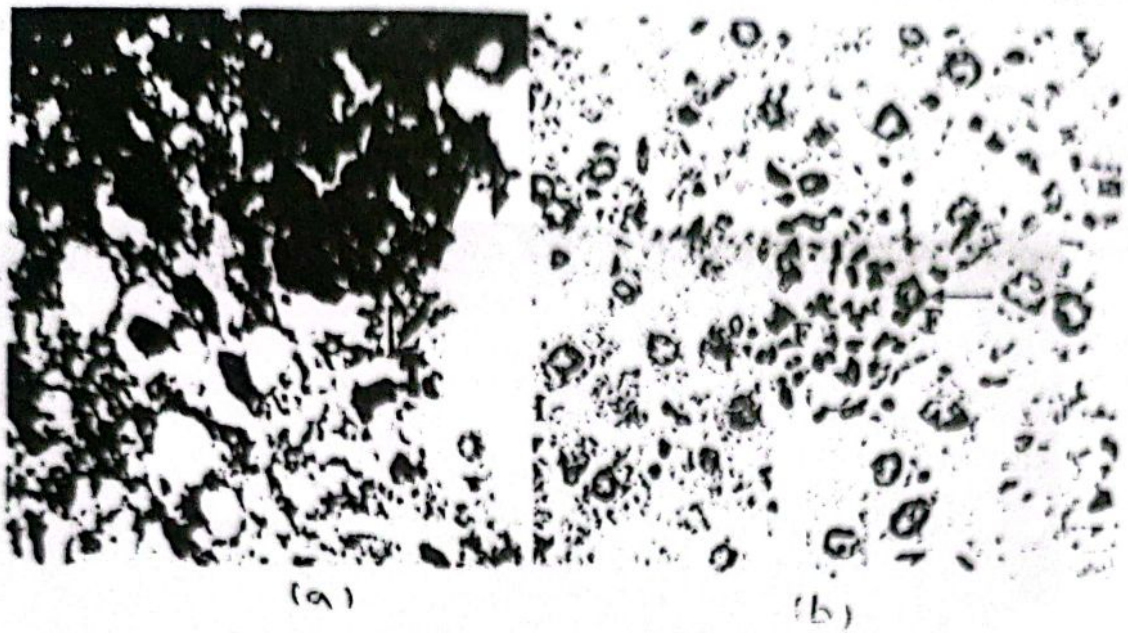

Fig. 6 a&b : a) Photomicrograph of brain of group3 showing *toxoplasma* tissue cyst. (PAS stain X 1000). b) Liver of group 3 revealing small focal area of necrosis with inflammatory cells aggregation. (H&E X 400).

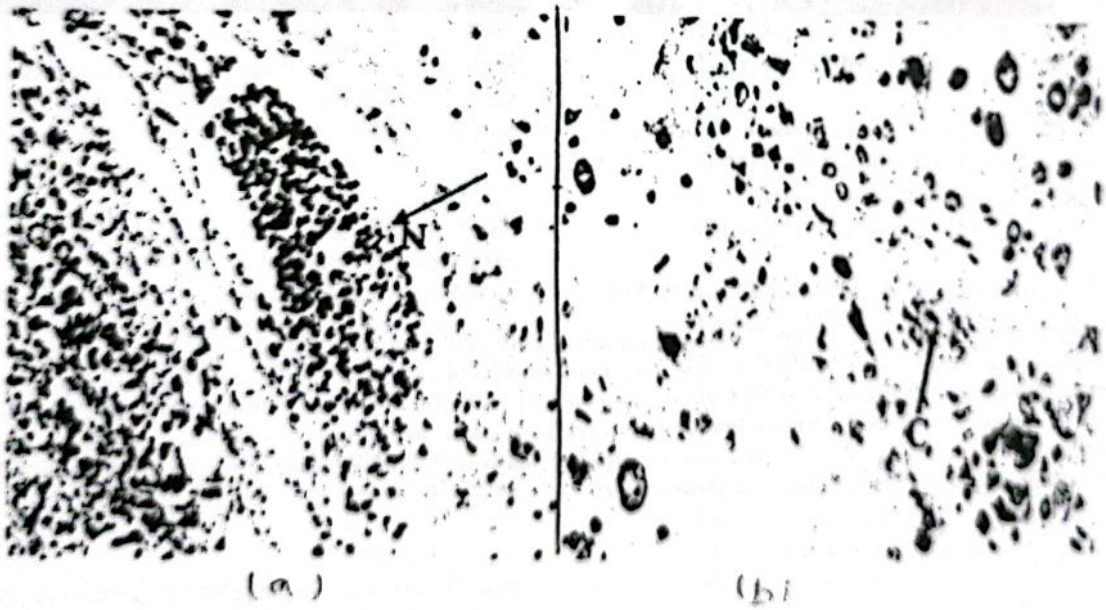

Fig. 7: a&b : a) Photomicrograph of brain of group 5 revealing focal area of necrosis with aggregation of inflammatory cells (H&E X 250). b) Liver of group 5 demonstrating congestion in blood vessels and sinusoids with haemorrhage. (H&E X 400).

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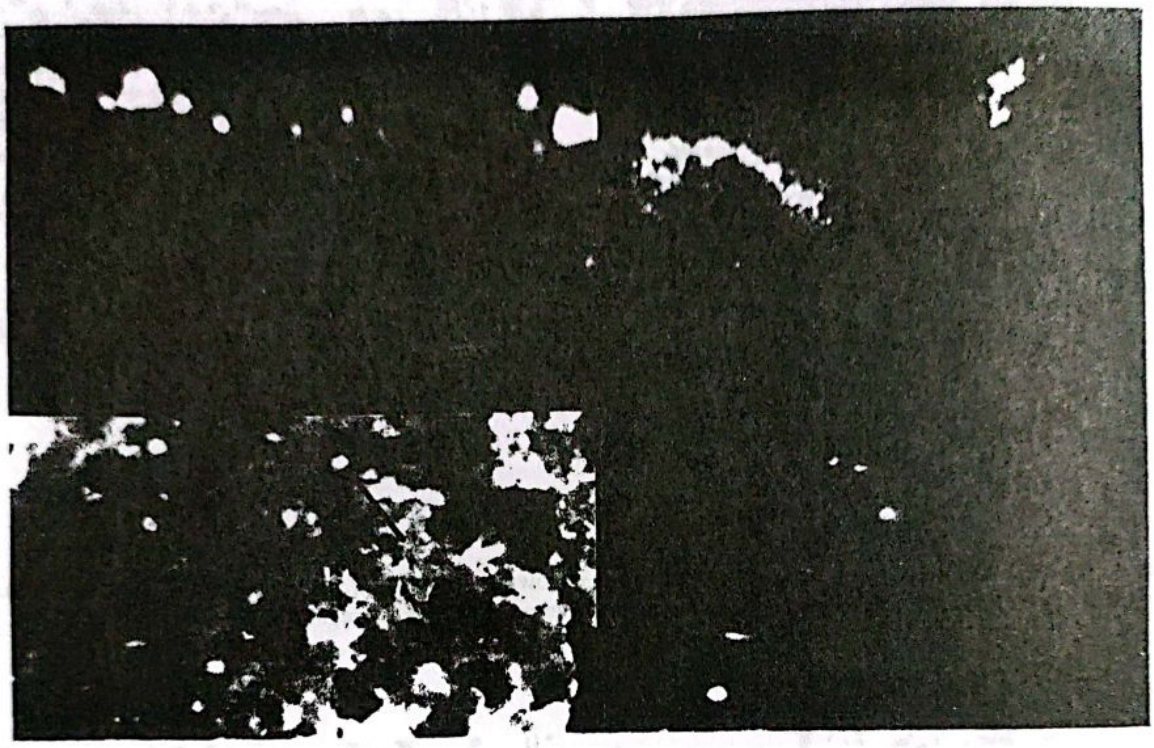

Fig. 8:a,b,c&d: a) Brain of group 2 showing immunoflourescent reaction against *toxoplasma* organism distributed throughout the meninges (Paraffin section, immunoflourescent stain X 400). b) Brain of group 2 showing immunoflourescent reaction against *toxoplasma* antigen within the blood vessels (Immunoflourescent stain X 400). c) Brain of group 3 revealing immunoflourescent reaction against *toxoplasma* tachyzoites within the brain tissue (Immunoflourescent stain X 200). d) Liver of group 2 showing immunoflooures cent reaction against toxoplasma tachyzoites antigen. (Immunoflourescent stain X 200).

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REFERENCES

Abudullah, K.T.; El–Fakahany, A.F.; Areafa, Salma, M.M. and Morcey, T.A. (1994): Congenital toxoplasmosis among premature infants with different clinical pictures in Arabia Saudi. J. Egypt. Soc Parasitol .pp 24:643-648.

Alan, J. and Robin, T. (1988): Production of antibodies in: immunochemistry in practice. 2nd ed. Blackwell Scientific Publication Boston, London. pp 30-34.

Amin, D.M. (1980): Pathogenesis of Toxoplsma gondii in laboratory animal as a Mean for diagnose is with particular reference to ultra structure changes in the cells. Ph.D,vet. Thesis, Cairo Uni.

Ankri, S. and Mirelman, D. (1999): Antimicrobial properties of allicin from garlic. J. Microb. Infec., 1 (2): 125-129

Bancroft, J.D.; Cook, H.C.; Stirting, R.W. and Turner, D.R. (1994): Manual of histological techniques and their diagnostic application. 2nd ed. Longman group U.K, pp. 241- 245.

Bao, E.; Zhang, X. and Wang, X. (1994): Histopathological study on mice that died from experimental infection with Toxoplasma. Anim. Vet. Med., 26 (2): 60-62.

Buchmann, K.; Jensen, P.B. and Kruse, K.D. (2003): Effects of Sodium Percarbonate and Garlic Extract on Ichthyophthirius multifiliis theronts and pesudocysts in vitro experiments. North. Am. J. Aqua. 65(1): 21-24.

Clayden, E.C. (1971): Practical Section Cutting and Staining. 5th Ed., Longman, London, 131-133.

Colorni, A.; Rami, A.; Wayne, K.; Evelyn, B. and Barbara, C. (1998): Histopathology of sea bass(Dicentrarchus labrax) experimentally infected with Mycobacterium marinum and treated with streptomycin and garlic (Allium sativum) extract. J. Aqua., 160: 1-17.

Conly, F.K.; Jenkin, K.A. and Remington, J.S. (1981): T. gondii infection of the central nervous system use of peroxidase-antiperoxidase method to demonstrate Toxoplasma in fixed formalin paraffin embedded tissue sections. Hum. Pathol. 12: 690-698.

Cox, F.E.; Wakelin, D.; Gillespie, S.H. and Despommier, D.D. (2005): In Parastitology. ASM press, London, pp. 422-439.

Dagc, H. and Aksuner, A. (2003): In vivo and in vitro effect of clarithromycin on Toxoplasma gondii Turkish. J. Infec., 17 (3): 325-328.

Degerli, K.; Kimcioglu, A. and Kurt, O. (2003): Efficacy of azithromycin in a murine toxoplasmosis model, employing a Toxoplama gondii from Turkey. ACTA 88 (1): 45-50.

Drury, R.A.; Wallington, E. and Acarlento, S. (1980): Histological technique. 5th ed., pp. 145-154, Oxford University Press. New York, pp. 55-60.

Dubey, J.P.; Lunney, J.K.; Shen, S.K. and O, C.H (1998): Immunity to toxoplasmosis in pigs fed irradiated T. gondii oocyst. J. Parasitol., 84 (4): 749-752.

Eid, R.A.; Abdel Aaal, A.A.; Barakat, A.M. and Fatma, M.M. (2004): A trial for vaccination of mice against toxoplasmosis. Egypt. J. Comp. Pathol. Clin Pathol., 17 (1): 1-25.

El-Kerdany, E.D. (1992): Effects of immunosuppressive drugs on experimental toxoplasmosis Ph.D.vet. Thesis, Alex Uni.

El-Menyawe, S.M. (1984): Some biological studies for the detection of Toxoplasma gondii antibodies during the different

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stages of infection among rats. M.V.Sc. Thesis, Cairo Uni.

El-Shennawy, S.F. (1977): Effect of Toxoplasma gondii on histopathology and histochemistry of reticulo-endothelial system in experimental animals. M.Sc. Thesis, Ain Shams Uni.

Glade, R.P. and Snider, M.E. (1990): Intracellular accumulation of a zituromycin by cultured human fibroblasts. Antimicrob. Chemother., 34: 1056-1060.

Gutierrz, M.D. (1990): Toxoplasmosis In: Diagnostic Pathology of Parasitic infection with clinical correlation. Lea and Febiger, Philadelphia, pp. 112-124.

Khoshazaba, F.; Ghazanfari, T.; Far, F. and Sharafi (2007): The effect of garlic extract on acute toxoplasmosis in mice. Iran J. Med. Plants. 23 (3): 295-306.

Khan, A.A.; Arujo, G.F. and Brighty, K.E. (1999): Anti-Toxoplasma gondii activities and structure activity relationsips of novel fluoroquinolones related to trovaproxacin. Antimirobial. Chem., 43 (7): 1783-1787.

Kumar, M. and Berwal, J.S. (1998): Sensitivity of food pathogens to garlic (Allium sativum)," J. Appl. Microbiol., 84 (2): 213-215.

Matossian, R.M.; Nassr, V.H. and Basmadgi, A. (1977): Direct immunofluorescent in the diagnosis of toxoplasmosis. J. Clin. Pathol. 30 (9): 847-850.

McGavin, M.D.; Carleton, W.W. and Zachary, J.F. (2001): Toxoplasmosis In: Thomsons special Vet. Pathol. Mosby. Philadelphia, pp: 1245-1246.

McLeod, R.; Frenkel, J.K.; Estes, R.G.; Mack, D.G. and Gibori, G. (1988): Subcutaneous and intestinal vaccination with tachyzoites of T. gondii and acquisition of immunity per oral and congenital Toxoplasma challenge. J. Immunol., 140 (5): 1632-1637.

Moshkani, S. and Dalimi, A. (2000): Evaluation of the efficacy of atovaquone alone or in combination with azithromycin against acute murine toxoplasmosis. J. Vet. Res. Commun. 24 (3): 169-177.

Mui, E.J.; Ja Cobs, D.; Milhous, W.K. and Schiehser, G. (2005): Triazine inhibits Toxoplasma gondii tachyzoites in vitro and in vivo. Antimicrob. Agent Chemother. 4 (8) : 3463-3469.

Sabin, A.B. (1941): Toxoplasma encephalitis in children JAMA: 116801- 11687.

Sadak, H.; Eiss, A.M. and Allam, S. (1999): Azithromycin in treatment of experimental toxoplasmosis. J. Med. Res. Instit., 20 (93): 68-78.

Shalaby, S.I.; Ashour, A.H. and Khalifa, R.M. (1993): Experimental toxoplasmosis in mice 1-serology and histology. Afr. J. Agricul. Sci., 20 (1): 1-9.

Tabbara, K.; Hammoudo, E. and Tawfik, A. (2005): Azithromy prophylaxis and treatment of marine. Parasitol. 30: 1217-1258.

Zhang, W.; Liu, Y. and Yang, L. (2006): Effect of changing capsule on Toxoplasma gondii tachyzoites as demonstrated by ultra structural studies. Chin. J. Zool. 22 (1) 51-53.

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فاعلية بعض العقاقير ودراسات باثولوجية على العدوى بداء المقوسات في الفئران

أماني محمدالقيسي- جيهان أحمد حسني- *جيهان جميل- **نهلة البكري - **رأفت عطية
*كلية التقنيات الطبية و الصحية- بغداد
*قسم الباثولوجي معهد بحوث صحة الحيوان، الدقي
**قسم علوم الحياة كلية التربية- ابن الهيثم – جامعة بغداد
**قسم الطفيليات معهد بحوث صحة الحيوان، الدقي

أجريت الدراسة الحالية لمعرفة تأثير العدوى بطفيلي داء المقوسات وفاعلية عقاري كل من الازثرومايسين وحبوب الثوم في علاج المرض الحاد في الفئران .أستخدم لهذا الغرض ٦٠ فأرا ابيضا تم تقسيمها الى ست مجاميع متساوية.

تم استخدام معايير كل من معدل البقاء ، تجارب القياس الحيوي وتفاعل التألق المناعي لتقدير التاثير المعنوي للعقاقير موضوع الدراسة .

أوجدت الدراسة فاعلية عالية لعقار الازثرومايسين بجرعة ٢٥٠ملغم/كغم/اليوم في الفئران المعدية بالطفيلي حيث اظهرت الدراسة ان معدل بقائها هو ٩٠% مقارنة بالفئران المعدية والمعالجة بحبوب الثوم بجرعة ٥٠٠ ملغم/كغم/اليوم والتي تبين انه اقل فاعلية في علاج الفئران المعدية حيث حيث تبين ان معدل بقائها هو ٤٠ %.

اظهرت الدراسة المرضية تحسن ملحوظ في الصور النسيجية للفئران المعدية والمعالجة بعقار الازثرومايسين مقارنة مع الصور النسيجية للفئران المعدية والمعالجة بحبوب الثوم.

تم في نهاية فترة التجربة دراسة كفاءة عقار الازثرومايسين والذي اظهر فاعليته في العلاج بعمل عدوى ثانوية بعالق ادمغة واحشاء الفئران المعالجة به والتي بقيت على قيد الحياة بفئران سليمة ومقارنتها بنتائج العدوى الثانوية بعالق ادمغة واحشاء الفئران المعدية غير المعالجة باي عقار بفئران سليمة حيث ماتت جميع فئران الثانية بعد 3ايام من اجراء العدوى(معدل البقاء صفر%) بينما بقيت جميع حيوانات الاولى على قيد الحياة (معدل البقاء١٠٠%).

تم الاستنتاج من هذه الدراسة أن لعقار الازثرومايسين تاثيرا معنويا في علاج حيوانات التجارب المعدية بطفيلي داء المقوسات ولكنه (أي العقار) لم يمكننا من القضاء على الطفيلي بصورة كاملة ،حيث لوحظ وجود الاكياس النسيجية للطفيلي في ادمغة الحيوانات المعالجة به ، بينما اظهرت حبوب الثوم تاثيرا محدودا في حيوانات التجارب التي تم معالجتها بها.

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