A HISTOPATHOLOGICAL STUDY OF LABROTARY MICE INFECTED WITH *Syphacia obvelata* IN BASRAH CITY

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Abstract:

The most common nematodes which infecting wild mice are Oxyurids, commonly called pinworms, and *Syphacia obvelata* one of them.

This study was showed that laboratory mice also can be infected with pinworms. *Syphacia obvelata* recorded recently in laboratory mice (Balb/ C) in animals' house at university of Basrah. So, isolation and identification of the nematode was done. A histopathological study for small and large intestine and liver of infected mice with *S. obvelata* was done by using Eosin – Haematoxyline staining.

The results of this study revealed that there were clear effects of this parasite on the liver undergo degenerative changes with hemorrhage and congestion with aggregation of neutrophils macrophage and eosinophils.

In the intestine atrophy of layers can be found, while, affected duodenum showed that there were a numerous goblet cells. In
rectum a clear proliferation of the lining cells and mucinous degeneration in the cells of mucosal layer can be shown. The current results on the pathogenic of *S. obvelata* in laboratory mice showed that worms have zoonotic importance of *S. obvelata* emphasized considerably that it may accidentally infect man by contamination of food with faeces of infected mice.
دراسة أمراضية – نسيجية للفئران المختبرية المخمجة

yphacia obvelata

في مدينة البصرة بـ جامعـة البـصرة

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الخلاصة:

تعد الخطيات أحد أهم الطفيليات التي تصيب الفئران البرية، ومنها الأكسورود وتسمى بالدبوسات، وتعتبر Syphacia obvelata أحد هذه الدوائر. أظهرت دراسة سابقة أن الفئران المختبرية كذلك بإمكانها أن تصاب بالدبوسات، وسجلت الدراسة إصابات فعلية بالطفيلية أعلاه. لذلك عزلت وصنفت الدودان الخيطية، ثم أجريت بعد ذلك دراسة أمراضية – نسيجية للفئران المخمجة بـ S. obvelata ونسبة الدبوسات، وحذرت بالهيماتوكسيلين.

النتائج التي خرجت منها هذه الدراسة هي تأثيرات واضحة للطفيلة على الكبد من تغيرات خلوية وتنكس مع نزف وتتسويف في خلايا وامتلاء واضح للأوعية الدموية بالإضافة إلى تجمع ملحوظ للمثبطات والخلايا البيض المعطولة والحمضية. كذلك لوحظت تأثيرات في الأثنين عشر حيث ظهرت العديد من خلايا كوبيلت. أما في الأمعاء فلوحظ ضمور واضح في طبقاته، بينما المستقيم لوحظ فيه تكاثر غير اعتيادي للخلايا المخاطية مع تنكس في خلايا الطبقة المخاطية، أظهرت النتائج الحالية حول أمراضية الحيوانات المختبرية المصابية أهمية هذا الديدان وضرورة إجراء العديد من الدراسات عليها لما تظهره من أمراضية مماثلة إذا ماصبت الإنسان بشكل عرضي من خلال تلوث طعامه ببراز الحيوانات المصابة.
INTRODUCTION

Pinworms of the order Oxyurina (Syphacia muris, S. obvelata and Aspiculuris tetraptera) are commonly found in laboratory animals (1). These infections are a persistent problem of well – managed animal’s colonies (2).

The prevalence of pinworms in an infected rodent population depends on many factors: including environmental load, gender, age, strain and immune status (3, 4).

*Syphacia* spp. reside in the cecum or anterior colon, where they feed on bacteria which present in the lumen, females migrate to the anus and lay their adhesive – coated eggs directly on the perianal skin. So, eggs become infective between 5 -20 hours after release with a prepatent period 11 -15 days. It may be embryonated on the host and retroinfection the animal by migrating back into the body (5, 6).

(7) Recorded that laboratory animals are suitable and necessary for the proper development of several biological assays and the utilization of these standard models is recommended aiming at the attainment of reliable and reproducible results.

Wilcke, (2007) reported that no signs are usually seen in mice and rodents which infected with *Syphacia* sp., but heavy parasite loads may lead to catarrhal enteritis or perianal irritation causing hair to be chewed off the tail bass.
In this approach, laboratory animals are seldom investigated for autochthonian endoparasite prior to their utilization in experiments, these parasites, if undetected, can interfere in the development of protocols and alter the interpretation of final results. Furthermore, the analysis of different biological parameters related to the presence of nematodes in the mice conventionally kept in animal houses in which sanitary conditions and barriers have not been properly controlled.

MATERIALS & METHODS

Laboratory mice (Balb/c) with heavily nematodes infected intestine was selected for histopathological study. For this purpose, selected portions of infected intestine and liver were fixed in 10% formalin for 24 hours, then, washed several times with 70% alcohol. Later, dehydrated through graded series of alcohols, cleared in xylene, kept in a mixture of xylene and wax overnight.

Then, transferred to pure wax for 8 hours. Blocks were made in cavity blocks avoiding air bubbles using a hot needle.

The cavity blocks were immersed in cold water for uniform cooling. These blocks were trimmed and fixed on microtome holders with a few drops of melted wax. Then, 4 M thick sections were prepared and parts of section ribbons were kept on slides with a few drops of water and stretched with slight heat from the burner.
These slides already had a little egg albumin on their surfaces to avoid sections dropping off during dewaxing. Finally, they were stained with Haematoxilin – Eosin. Photographs were done under digital camera in College of Veterinary Medicine/ University of Basrah.

RESULTS

Observations are based on a several serial section of a portion of liver and intestine in laboratory mice.

Gross observations of the intestine before processing for histopathological studies revealed that the lumen of the intestine contained thick creamy mucous and worms were found free in the mucous, while, some of them were found to have penetrated the intestinal wall.

Histopathological observations indicated that infected liver shows many necrotic areas in hepatic tissue with hemorrhage and aggregation of many types of cells (figure: 1, 2) as compared with non infected liver (figure: 3).

The intestinal mucosa was completely destroyed in the affected region, showing atrophy of the villa and underling tissue, furthermore, a granulomatous lesion were obvious in infected intestine as compared with normal one (figure: 4, 5).
The observation in infected duodenum shows a damaged in villa and degeneration of cells, while, muscular layer were totally damaged (figure: 6). A clear distraction in both layers of muscles with atrophy were found in figure: 7 as compared with normal duodenum (figure: 8).

Infected rectum in figure: 9 shows a proliferation of the lining cells with mucinous degeneration and dissolution of masses leaving empty spaces, with infiltration of neutrophils and eosinophils with a slight number of macrophage (figure: 10), comparing with normal rectum (figure: 11).

No histopathological observations were found in cecum and other parts of small and large intestine in mice under this study.
Figure: (1) Infected liver with hemorrhage and Aggregation of cells. (40X).

Figure: (2) Infected Liver with necrotic area in the hepatic tissue. (10X).

Figure: (3) Control Liver show normal hepatic cells (100 X).
Figure : (4) Infected small intestine with atrophy of layers & villa & dissolution of masses leaving empty spaces. (40X).

Figure : (5) Control intestine show villa & normal cells (40 X).
Figure (6) infected duodenum with Degeneration of cells & villi. Muscular layers are totally damaged. (10X).

Figure (7) Infected duodenum show numerous goblet cells. With distraction of both layers of muscles with atrophy. (40X).

Figure (8) Normal duodenum show Villa & no degeneration of cells (10X)
Figure: (9) Infected rectum with proliferation of the lining cells of villa & mucinous degeneration. Dissolution of masses leaving empty spaces. (10X)

Figure: (10) Infected rectum showing infiltration of neutrophils, eosinophils & slight no. of macrophage (40X).

Figure: (11) Normal rectum showing no proliferation of cells of villa & mucinous degeneration (10X).
DISCUSSION

On a world scale the most serious vertebrate pests are rats and mice, especially those kinds adapted to live closely with man (9).

Laboratory animals are a suitable and necessary for the proper development of several biological assays (7).

Infection with pinworms is generally considered to be mildly – pathogenic or non – pathogenic in animals with normal immune systems. However, pinworms infection may interfere with research goals in a number of ways (6).

Pinworm infection has been shown to increase the host humoral immune response to non parasitic antigenic stimuli and accelerate the development of the hepatic monooxygenase system (1).

The present study indicates the total destruction in intestine, duodenum, rectum and liver with sever destruction occurs only in the mucosa and sub mucosa in some region.

Such types of changes were observed in rodent's colonies which infected with S. obvelata (6).

Hayunga, (1991) recorded that no gross lesions were found associated with oxyuriasis in mice which reported by microscopic examinations. While, reveal the presence of immature worms in mucosal glands with increased a numbers of lymphocytes and leukocytes in the colon mucosa (11).
Finally, experimental animals maintained in laboratories are subject of concern, considering the role they play in the evolution of biological parameters in the different fields of scientific research. Taking this into account and depending on the assay under development, so, the presence of helminthes in those hosts, for example, must be regarded as a restricting factor for the proper attainment of experimental protocols.

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REFERENCES


