IDENTIFICATION AND PATHOLOGY OF STRONGYLU S SPECIES IN NATURALLY INFECTED MULES.

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SUMMARY

Naturally infected large intestine of 16 mules were collected during one year period. All three species of Strongylus were identified: S.vulgaris, S.equinus and S.edentatus. Specimens were processed for standard histological examination. The effect of the parasite on the wall of the intestine included the surface epithelium, glandular tissue, muscularis mucosa and part of the submucosa. Changes on the intestinal wall were observed at the site of the parasitic attachment, which included oedema, cellular infiltration with congestion and haemorrhages.

INTRODUCTION

Strongylosis of equine is caused by mixed infection of several strongyle species in the large intestine. It is a big problem because of its effect on the general health and performance of animals. S.vulgaris prevalence and abundance were studied by several investigators in different countries (Foster, 1937; Slocombe and McGraw, 1973; Ogburne, 1976; Reinemeyer et al., 1984). Creatorex (1975) described the pathological changes in horses with Strongylus vulgaris larval
migration, while Duncan (1974) stated that effect of the adult *S. vulgaris* in the lumen of the intestine is not fully described.

Pathogenicity of *Strongylus* species and the lesions they produce on the wall of the large intestine were not studied extensively. The only available report on parasitic infection in Iraq was by Leiper (1957) who detected two species of helminths (*Trichonema* spp.) and (*Setaria* *equine*). No further information is available in the literature with regard to seasonal distribution or pathological lesions caused by equine large red worm in Iraq. Therefore, it was felt desirable to study the *strongylus* spp. prevalence and their pathological lesions.

MATERIALS AND METHODS

Infected regions of large intestine of 16 mules, (4-5) years old, were collected immediately after sacrificing the animals. Specimens were collected during one year period extending from March, 1985 to February, 1986. Helminths were collected, studied and diagnosed using the criteria of Skerman and Hillard (1966) and Georgi (1974). Tissue specimens were placed in 10% formaline solution or 70% alcohol for fixation for 48 hours or more and processed for routine histopathological examination. Tissue specimens were sectioned and stained with Harris hematoxylin and eosin stain. Further, few sections were stained with periodic Acid Schiff (PAS) reagents (Luna, 1968).

RESULTS

Parasitology: Three species of *Strongylus* were identified from the mucosa of the large intestine. Table (1) shows that *S. vulgaris* and *S. edentatus* were the most
Table 1: Helminthes detected in the large intestine of naturally infected mules in Iraq.

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Date of sacrifice</th>
<th>S. vulgaris</th>
<th>S. equinus</th>
<th>S. edentatus</th>
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<td>3/1985</td>
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</table>

The predominant species recovered followed by S. equinus which was detected in small number (Fig. 1).

Histopathology: In most cases the bite of the parasite was big. It included the epithelium, glandular tissue, muscularis mucosa and part of submucosal layer (Fig. 2). Surface epithelium and superficial layer of the glands were completely digested, while the rest of the glandular tissue in the region of the bite was masked by debris of the cells and blood. The area of the bite was
Fig. 1.

Microphotograph showing the parasite (*S. edentatus*) close to the site of attachment in the intestine of mule. Notice the erosion of the surface epithelium. H & E Stain. 75 X.

Fig. 2. *S. edentatus* at the site of attachment. H & E Stain. 35 X
severely congested and in some places small haemorrhage were obvious (Fig. 3).

Adjacent areas were oedematus and infiltrated by eosinophils. Further, mononuclear infiltration especially lymphocytes, plasma cells as well as macrophages were abundant. These cells tend to increase in number toward the deep layer of lamina propria and submucosa close to the site of attachment of the parasite. Hemosiderin laden macrophages were abundant because of hemolysis of red blood cells.

Fig. 3.

The exact site of attachment of the parasite (*S. vulgaris*) in the wall of the large intestine. Notice the bite included the lamina propria with muscularis mucosa. H & E Stain. 70 X.

C- Buccal Mucosa
D- Lamina muscularis mucosa
E- Cellular infiltration
blood cells. Eosinophils decreased in number as the bite was approached so that no eosinophils were present inside the bite itself.

In some specimens, the muscularis mucosae were thickened and bulged inside the bite, while in other specimens, the muscularis mucosae were broken and did not bulge into the bite. Other region of attachment showed less changes and the parasitic bite included the surface epithelium and few layers of glandular tissue, whereas muscularis mucosa was intact and not included. The surface epithelium of the bite in this case was highly congested with blood. In such area of attachment, eosinophils and plasma cells were present but not in large numbers as compared to other sections.

In addition, goblet cells increased in number at the site of attachment. Muscular arteries were seen sometimes, especially in the vicinity of the attachment of the parasite.

**DISCUSSION**

Parasitology: Little informations are available on the presence of *Strongylus* spp. in mules, as these animals and the donkey act as a carrier for spreading of helminths infection to horses. The parasites observed in this study are recorded for the first time in Iraq. Histopathology: The pathogenic effect of the worm on the intestine of the animals depend on the number of the parasites and the size of the bite involved from the mucosa of the intestine. Some of the migratory genera involve the mucosa only, especially migratory larvae which most of the time leave the epithelium intact when they move to a fresh site (Dunn, 1978).
In this study, ulcerative damage and rupture of muscularis mucosae in most cases were detected. Haemorrhage at the site of attachment was observed in some specimens with the adjacent areas infiltrated by large number of eosinophils. Diarrhoea might result due to slaughtering of epithelium, increased number of goblet cells and increased mucine content in the intestine.

Nodules containing a single worm in yellowish purulent matter have been found in the small and large intestine even in the stomach wall (Dunn, 1978). No such nodules have been observed in the specimens examined in this investigation.

Macrophages, eosinophils and plasma cells infiltration with thickening of muscularis mucosae and thickening of the arterial wall adjacent to the infected area were observed. These findings were in agreement with earlier studies done by Greatorex (1975) and Dunn (1978) in horses.

The site occupied by some parasites in the intestine was speculative by several researchers. It could be due to physiochemical conditions in the gut lumen and feeding habits, which explains why so many species are able to coexist within the same individual host (Duncan, 1975; Crompton, 1973).

REFERENCES


امراضية الخمج الطبيعي بديدان من نوع

في البغال Strongylus

احسان مهدي المقر 1، وائل عبد الحميد 2، صباح ناجي الدائلي 3
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الخلاصه

جمعت الامعاء الفضفاضة لستة عشر بغلًا مخممة بحورة طبيعية خلال
سنة واحدة. وتم تشخيص ثلاثة طفيليات من جنس
S. vulgaris، S. equinus، and S. edentatus، وال موجودة في جدار الامعاء، وهي
التي تمت العينات للفحص النسيجي المرضي باستخدام
الطرق القياسية وقد وجد من الدراسة ان تأثير الدافلي على جدار
الامعاء كان كبيرًا حيث شمل الظاهرة السطحية والنسيج الغدي
والصفحية العضلية المخاطية وجزء من الطبقة تحت المخاطية. لوحظت
تغيرات كبيرة على جدار الامعاء عند الاتصال الدافلي اشتملت على
مع احتان cellular infiltration وارتشاح خلوي Oedema ونزف في بعض الاحيان.