Detection of microfilaria infection in horses in Mosul city

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Abstract

The study was performed on 78 horses in Mosul city were examined from April 2007 to September 2009 for the detection of microfilaria infection in horses in Mosul city. Twenty five clinically normal animals served as control. The percentage of the infection with microfilaria of Setaria spp was 30.76% they were sheathed, measuring 204-228 µm within a mean of 218.4 µm in length and 4.5-4.8 mµ within a mean of 4.62 µm in width. A high percentage of infection was reported in females 54.28% with some clinical signs or between these treated with ivermectin or non treated. Haematological changes indicated decrease in the number of total leukocytes count, anemia was macrocytic hypochromic type.

Keywords: Microfilaria; Setaria spp; Ivermectin; Equine.

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Introduction

Filariod nematodes are known to occur among domestic animals all over the world (1). In equines, there are many species of nematodes in order: Spirurida, Superfamily: Filarioidea, Family, Filaridae, Onchocerchidae and these families include many genera and species that infect equines like: Onchocerca cervicalis, O. gutturosa, O. reticulata, Setaria equina and Parafilaria multipapillosa (2,3), generally, species of Onchocerca are medium-sized filarioïdes which usually inhabit subcutaneous tissues ligaments and aponeuroses of large mammals whereas species of Setaria are found in the abdominal cavities of artiodactyls, the filariids (Parafilaria and Stenphanoïdaria) are small to medium-sized subcutaneous parasites of certain mammals. All filarioïd
Results

The number of positive samples was 24 with a total percentage of 30.76%. From Table (1) it is evident that there were a significant $P<0.05$ differences in percentage of infection between males (11.62%) and females (54.28%). In Table (2) microfilariae diagnosed in 20 blood samples which were collected from healthy animals with a percentage of 28.57% while the percentage of infection with microfilariae in animals showed some clinical sings such as weakness, respiratory sings depression and variable appetite was 50% no significant differences were noticed between healthy and those showing some clinical sings. In Table (3) there was no significant difference between treated and non treated horses with ivermectin and 27.69% of non treated horses were positive for microfilariae while 46.15% of treated horses were positive for microfilariae. The hematological picture elucidated in Table (4) reveals that there was a significant ($P\leq 0.05$) reduction in HB PCV MCHC, with significant ($P<0.05$) increase MCH and total WBCs in infected horses compared with control.

Table 1: The percentage of infection with microfilariae according to sex.

| Sex of animals | No. of the examined animals | No. of the positive animals | % |
|----------------|-----------------------------|----------------------------|----|
| Males          | 43                          | 5                           | 11.62 a |
| Females        | 35                          | 19                          | 54.28 b |
| Total          | 78                          | 24                          | 30.76 |

Groups with different letters have significant differences of $P \leq 0.01$.

Table 2: Percentage of Microfilariae infection in horses showed some clinical sings and horses clinically normal.

| Groups of horses | No. of the examined horses | No. of the positive horses | % of infection |
|------------------|-----------------------------|----------------------------|----------------|
| Horses clinically normal | 70                          | 20                          | 28.57 a |
| Horses with some clinical sings | 8                           | 4                           | 50 a |
| Total            | 78                          | 24                          | 30.76 |

Groups with same letters have non-significant differences at $P \geq 0.01$.

Examination of blood by Knott's technique revealed the presence of microfilariae which may be related to species of Setaria equina and the identified of microfilariae based on
morphological characteristics and the site of infection. Microfilariae ranged between 204-228 µm within a mean of 218.4 µm and the width ranged between 4.5-4.8 µm within a mean of 4.62 µm, and these microfilariae are sheathed and the number of microfilariae which were present in blood film ranged between 1-2 larvae (Fig. 1).

Table 3: Percentage of Microfilariae infection between treated and non treated horses.

| Groups of horses | No. of the examined horses | No. of the positive horses | %     |
|------------------|-----------------------------|-----------------------------|-------|
| Non treated      | 65                          | 18                          | 27.69a|
| Treated horses   | 13                          | 6                           | 46.15a|
| Total            | 78                          | 24                          | 30.76 |

Groups with same letters have non-significant differences at P ≥ 0.01.

Table 4: Blood parameters of infected group with microfilariae and control group.

| Parameters                | Control            | Infected           |
|---------------------------|--------------------|--------------------|
|                           | Mean ± S.E.        | Mean ± S.E.        |
| RBC x 10⁶ microliter      | 7.44 ± 0.72        | 7.34 ± 0.31        |
| Hbg/100 ml                | 13.27 ± 1.79       | 12.44 ± 1.57*      |
| PCV %                     | 35.53 ± 3.78       | 33.00 ± 5.21*      |
| MCV %                     | 16.64 ± 1.39       | 17.96 ± 1.07*      |
| MCHC g/100 ml             | 10.67 ± 2.14       | 10.04 ± 2.75*      |
| WBC x 10³ microliter      | 51.38 ± 1.37       | 51.96 ± 1.49*      |

* P ≤ 0.05.

**Discussion**

In this study, the total percentage of infection with microfilariae in blood samples of horses was 30.76% the species of microfilariae which were diagnosed may be mf of *Setaria equina* these results were agreement with a study which performed in Mosul city by (15) who referred the presence mf in 10 out of 50 blood sample of horses and mf of *Setaria equina* diagnosed in 5 horses. In other studies carried out in different parts of the world indicated that the high prevalence of microfilariae in horses in Asia, Europe and America (9-11), also (13) showed that the infection rate with *Setaria equina* may be high and up to 50% of horses may be infected in endemic area, while in a study done in Finland demonstrated through the examination of blood and skin that the horses and sheep may be free from Filaroid nematodes (5).

The high rate of infection with microfilariae appeared in females (54.28%) with a significant difference between males and females, was in agreement with (6,19,20) while (7) referred that the infection was more common in older horses and occurred in both sexes equally. From the Table 2 there was no significant difference in the percentage of infection between animals apparently healthy and animals showed some different clinical sings. Infections with helminthes often cause chronic disease with a wide spectrum of clinical manifestations, ranging from a symptomatic to severe pathology (21). Radosititis et al., (22) showed a high incidence of *S. equina* infestation has been observed in horses in Europe and although no clinical illness was observed there was evidence of recent peritonitis at slaughter.

*Setaria equina* is found in the peritoneal cavity and sometimes in the scrotum, it has also been recorded from the pleural cavity lungs and eyes of the horses, with no clinical sings when worms in their normal sites, but when nervous tissues involved there is locomotor disturbances of the hind limbs and if the parasites are high in the spinal canal there may be paraplegia (13, 23) Abu-Elmagd and Ahmed (24) showed that the *Setaria equina* could affect on donkey eye with serious lesions such as continuous lacrimation and ulcerative dermatitis.

Their was no significant differences between animals non-treated with ivermectin and animals had history of treatment with ivermectin the percentage of infection with microfilariae in treated animals was 46.15% and the blood of these animals examined after 7-14 days post treatment Eub-Elmagd et al., (25) revealed that the treatment with ivermectin (Ivomc-MSD) by the injection 1.0 ml/50 kg B.W of one dose subcutaneously gave good results after 7days post treatment. This drug was effective on adults and microfilaria of *S.equina* in horses suffering from the enlarged scrotum the efficacy of ivermectin was...
demonstrated through disappearance of those clinical sings and microfilaria

Hematological parameters showed relatively significant decrease in the level of hemoglobin and packed cell volume in infected horses as compared to control groups these results were agreement studies carried out on cattle and dogs by others (26-29) and this might be due to rapid disintegration of erythrocytes causing hemolysis (27). Anemia was macrocytic hynchopiet type due to significant increase in the mean corpuscular volume and reduction in the mean corpuscular hemoglobin concentration. Sharma and Pachauri (30) revealed that the filarial worms meet their nutrients requirement from the host tissues and fluids and in situ transfer of nutrients from the host tissues to the body of parasites causes various deficiency symptoms including anemia depending on the worm load of the host. The significant increase in WBC was agreement with (26-29) in cattle and dogs and (29) showed that the rise in the total leukocytes count (TLC) was indicative of chronic parasitemia and the rise in the eosinophil count was coupled with the microfilaraemia which indicated body response of defense mechanism through the parasitical action of eosinophil, the degree of lymphocytosis occurred depend upon the intensity of parasitemia.

About all of these results, the differences in the prevalence of the infection could be attributed to many factors such as the number of blood samples examined, seasons of the study (the prevalence is higher in wormer countries, where there is long seasonal activity of the mosquitoes vectors), animals factors (sex, age, breed, etc.), farm management and the time of blood taken because the microfilaria characterized by having the diurnal or nocturnal periodicity and the number of microfilariae are present in greatest numbers in capillary blood between 8 and 12 pm at lower temperatures and at higher barometric pressures, all of those factors would probably increase the chances of spread by insect vectors (13,19,20,22,23).

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