

Epidemiological Survey on Equine Filariasis in the Urmia Area of Iran

H.R. Enami

Department of Animal Biology, Faculty of Basic Sciences, Shahed University,
Opposite Imam Khomeini Shrine, Tehran-Qom Highway, Tehran, Iran

Abstract: Peripheral blood samples were collected from 162 horses and donkeys in various regions of Urmia area-Iran and the presence of microfilariae was evaluated by the Knott method. On the basis of morphological identification, 52 of 162 (32.1%) were infected with *Setaria equina* (40 cases), *Parafilaria multipapilosa* (6 cases) and *Onchocerca reticulata* (6 cases) and the infection with *Setaria* was confirmed in a case by necropsy. The number of microfilariae was between 1 and 935 larvae in 1 mL of blood. There was correlation between the time of sampling, age or sex and the prevalence of infection. The prevalence was higher in females (43 vs 31%) and in age group 7-16 vs 1-6 year (34.3 vs 32.3%). There was a significant association between the prevalence of microfilaraemia and the climate condition, thus it was higher between late spring and early fall because of more vector abundance and activity (50 vs 3.2%).

Key words: Equidae, filariasis, Knott method, microfilariae

INTRODUCTION

After finding the filarial nematodes as a pathogen agent in equidae in 1902, several studies have been carried out by scientists and a diagnostic method performed by Knott (1939). In Iran for the first time, filarids of equidae are reported in the Tehran area (Mirzayans and Maghsoodloo, 1977) and the present study is the second one in Iran. In this study, Microfilariae of 3 genera, namely *Setaria equina*, *Onchocerca cervicalis* and *Parafilaria multipapilosa* were recovered from blood samples of equidae in Urmia, Iran. These nematodes are found in peritoneal cavity, ligamentum nuchae and subcutaneous tissues of equidae, respectively (Soulsby, 1982).

MATERIALS AND METHODS

This research was conducted from December 2006 to November 2007 in which blood samples from a total of 162 horses and donkeys was collected in the Urmia area-Iran (Table 1). The blood samples were examined by Knott (1939) method. Direct method and Geimsa staining were performed for all samples to confirm detection of microfilariae, simultaneously. Thick blood smears were

prepared and stained with Giemsa's stain. The species were differentiated according to the criteria of Levine (1968).

RESULTS AND DISCUSSION

The results of the survey are summarized in Table 2. Of 162 blood samples 52 (32.1%) were positive. Positives were infected with *Setaria equina* (40 cases), *Parafilaria multipapilosa* (6 cases) and *Onchocerca reticulata* (6 cases). In one case, infection with *Setaria* was confirmed by necropsy. The prevalence was higher in females than males (Table 2) and age group 7-16 than 0-6 (Table 3). The prevalence of blood filariasis according to age of cases is shown in Table 4 and Fig. 1 and 2. The abundance of filariasis in warm and rainy months was more than cold ones (Table 5). The number of microfilariae was between 1 and 935 larvae in 1 mL of blood.

In the present survey, for the first time, occurrence of filarial infection of equidae is shown in the Urmia area

Table 1: The total equidae population examined by genus and sex

Sex	Donkey	Horse
Male	6	142
Female	0	14
Total	6	156

Table 2: The prevalence of blood filariasis by sex

Sex	No. exam	No. positive	(%)
Male	148	46	31
Female	14	6	43
Total	162	52	32.1

Table 3: The prevalence of blood filariasis by age group

Age group	No. exam	No. positive	(%)
0-6	92	28	32.6
7-16	70	24	34.3
Total	162	52	32.1

Table 4: The prevalence of blood filariasis by age in equidae

Age (year)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No. exams	4	4	16	22	10	36	14	18	10	8	0	6	0	8	0	6
No. positives	0	0	4	10	4	10	4	6	0	6	0	2	0	2	0	4
Infection rate (%)	0	0	25	45.5	40	27	28.6	33.3	0	75	0	33.3	0	25	0	66

Table 5: The prevalence of blood filariasis by month

Month (s)	No. exam	No. positive	(%)
Dec-Apr	100	50	50.0
May-Nov	62	2	3.2
Total	162	52	32.1

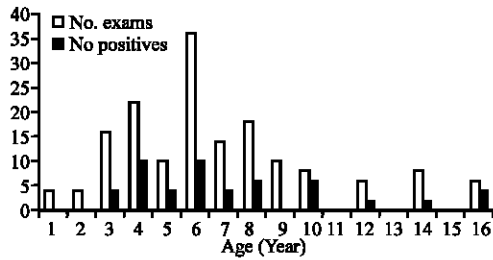


Fig. 1: The distribution of blood filariasis by age in equidae

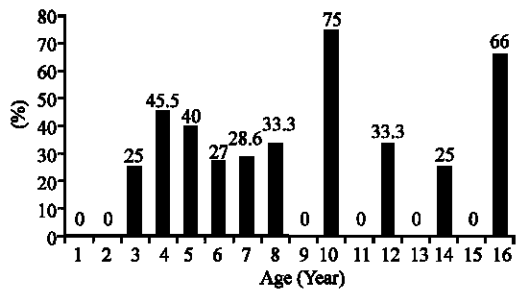


Fig. 2: The infection rate (%) in equidae by age

of Iran. In all cases, only blood samples were examined. No secreting exudates (for *Parafilaria* sp.) or neck biopsies (for *Onchocerca* sp.) were collected. In acute and sub-acute infections, filarid nematodes are present in peripheral venous circulation in their larval stage. In later studies, blood samples were collected from lower temperature body regions such as ear, nose and tail (Hussein and El-Sammani, 1990) but in this survey blood samples were collected from jugular vein. Higher infection rate in 7-16 age group and higher average age of equidae in the Urmia area may be a reason for more prevalence of filariasis in this area compared to Tehran, Iran (Mirzayans and Maghsoodloo, 1977). In some previous studies, infection rate in age ≥ 7 was 87 and 100% (Lyons, 1986, 1988). The results are also according to Cummings and James (1985). Higher rate of infection in

females has been reported by others, possibly due to hormonal activity and slightly higher body temperature of females as an important factor to attract the vectors (Lyons, 1986). In present study, it is concluded that equine filariasis is an significant issue in the Urmia area and must be carefully attentioned by local specialist to avoid serious consequent adverse effects.

ACKNOWLEDGEMENT

The author wish to thank the parasitology laboratory of Urmia University and Urmia Veterinary office for the technical assistance.

REFERENCES

Cummings, E. and E.R. James, 1985. Prevalence of equine onchocerciasis in southeastern and mid southern of united states. *J. Am. Vet. Med. Assoc.*, 186: 1202-1203.

Hussein, H.S. and S.E. El-Sammani, 1990. *Onchocerca raillieti*. Release from skin snips. Maintenance *in vitro* and periodicity of microfilariae. *Vet. Res. Comun.*, 14: 31-39. PMID: 2316189.

Knott, J., 1939. A method for making microfilarial surveys in day blood. *Trans. Roy. Soc. Trop. Med. Hyg.*, 31: 191-196.

Levine, N.D., 1968. *Nematode Parasites of Domestic Animals and of Man*. 1st Edn. Burgess Publisher, Minneapolis, USA., pp: 103-105. ISBN: 0808712993.

Lyons, E.T., 1986. *Onchocerca* sp.: Frequency in thoroughbreds at necropsy in Kentucky. *Am. J. Vet. Res.*, 74: 882-884. PMID: 3963592.

Lyons, E.T., 1988. Verification of ineffectual activity of ivermectin against adult *Onchocerca* sp. in the ligamentum nuchae of horses. *Am. J. Vet. Res.*, 46: 983-985. PMID: 3421544.

Mirzayans, A. and H. Maghsoodloo, 1977. Filarial infection of equidae in the Tehran area of Iran. *Trop. Anim. Health Prod.*, 9: 19-20. PMID: 143741.

Soulsby, E.J.L., 1982. *Helminthes, Arthropods and Protozoa of Domesticated Animals*. 7th Edn. Lea and Febiger Pub. Philadelphia, Pa., USA., pp: 307-319. ISBN: 0-7020-0820-6.