



Prevalence and distribution of sheep and goats lungworm in Sulamaniyah province

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Abstract

Pneumonia is one of the most common diseases in the small ruminants and the lungworm is one of the most causative agents of it. Analytical study of lung worm infection was conducted in Sulaimaniyah province from November, 2012 to March, 2013 with the aim of determining the prevalence of lung worm infection of small ruminants to identify the species of respiratory helminthes involved in the area. For this purpose fecal samples of sheep and goats of all age groups and both sexes were examined by Modified Baermann technique for the extraction of L1 larvae. The finding indicated that the total 392 fecal sample of sheep prevalence rate 60(15.3%) were found invariably infected with different species of lung worm that was *Muellerius capillaries*, *Dictyocaulus filaria* and *Protostrongylus rufescens* with percentage rate 30(7.9%), 27(6.8%) and 3(0.7%) respectively. A total of 102 goats fecal samples 17(16.6%) was infected by the same species of the lung worm *Muellerius capillaries*, *Dictyocaulus filaria* and *Protostrongylus rufescens* 4(3.9%), 11(10.7%) and 2(1.9%) respectively. In the abattoir of Sulaimaniyah province the total lung samples 283 the infection species was *Muellerius capillaries*, *Dictyocaulus filaria* and *Protostrongylus rufescens* in sheep 9(4.1%), 12(5.5%) and 4(1.8%) respectively and the rate in goats 8(11.7%), 10(14.7%) and 0(Zero%) respectively. The prevalence of lungworm infection showed a significant association ($P < 0.05$) with different district where in Bazyan there higher infection by longhorn 8(17.4%) and the lowest infection rate was in Arbat 10(12.6%). It can be summarized that small ruminant lung worm infection is a problem of a significant magnitude in Sulaimaniyah province. Lack of treatment and poor management and husbandry practices are likely factors responsible for the high prevalence rates observed in the area of study.

Keywords: Lungworm, *Muellerius capillaries*, Sheep, Goat, Sulaimaniyah.

Introduction

Sulaimaniyah province has a population of about 920000 sheep and about 480000 goats (Sulaimaniyah province veterinary center directorate). Sheep and goats are the most numerous of man's domestic livestock and are especially important in the more extreme climates. Of the worlds' 1,614 million sheep and 475 million goats, 65 and 95%, respectively, are located in developing countries. Small ruminants in Africa are noted for their ability to convert low cost feed into high value products, namely: meat, milk, fiber, manure and hides. Livestock plays an important role in rural economics, and the poor livelihood in developing countries. It is not only the food production, but it is also considered as a quick source of cash. Despite the importance of livestock to poor families, they are affected by climate change, population growth, diseases out- breaks and development trends (Richa and Perry, 2010)

Parasitic disease in domestic ruminants were directly effect in term of lower productivity (Sykes, 1994) During the control and treatment of ruminant's helminthiasis species, age of animal and agroecology should be considered as potential risk factors for the occurrence of the disease (Dagnachew, 2011). Primary infection to pulmonary parasites causes immune suppressing in lungs and subsequently secondary microbial contamination causes inflammation and bronchopneumonia (Eslami, 1999) Demostic animals are commonly effect with hydatid cyst, cysticercus, Fasciola hepatica, *Dictyocaulus filaria* causing considerable economic losses in form of mortality and partial or complete condemnation of the carcasses at the slaughter houses and importance of the disease particularly in rural where more closes association between man and domestic animal (Bin Kobir *et al.*, 2010). The aim of this study was to determine the prevalence rate of lungworm in Sulaimaniyah

province due to the economic losses by the decrease animal production and the cost of the control program.

Materials and Methods

Sampling: Five districts (Arbat, Qaradax, Bazyan, Aghgeler and Kalar) located in the Sulaimaniyah province of Kurdistan Region in Iraq were selected for this study. The selection was on the basis of predominance of sheep and goats in the farming production systems the records of the Sulaimaniyah province veterinary directorate indicated that about 39.9% of the sheep and goats populations are located in the selected study area Table (1). A total of 494 fecal sample were collected from March 2012 to March 2013. Sample were divided as 392 sheep and 103 goats were collected from live animals and 283 lung samples of sheep and goats from Sulaimaniyah slaughterhouse to detect the adult worm where all samples collect in sterile container then transport to veterinary diagnostic laboratory. All the results.

Diagnostic methods: The techniques recommended by Urquhart *et al.* (1992) were employed for identification of lung worm species from the

collected samples. In the laboratory, following the conventional method of Baerman technique for detection of lungworm larvae, 25gm of fresh feces were weighed from each sample for the identification of L1 larvae.

Postmortem Examination: Total lung sample 283 (215 sheep and 68 goats) was collected for post mortem examination of adult lung worms and the identification of the species involved. Lung was examined immediately after slaughter from the sampling units. The species of animal, species of lung worm and date of sampling of slaughtered animals were labeled. The air passages were opened starting from the trachea down to the bronchi with fine blunt pointed scissors to detect the parasites.

Data analysis: Prevalence was determined by the percentage (%) positive and chi-square (χ^2). To measure association were the statistical tools applied and determined using statistical package for social sciences (SPSS) V 19.0. In all the analysis, confidence level was held at 95% and 5% level of significance (Thrusfield, 1995).

Table (1): Number of samples from districts:

Region	Sheep	Goats
Sulaimaniyah province	920000	480000
Arbat	41000	8000
Qaradax	14000	9000
Bazyan	48000	11270
Aghgeler	63000	18000
Kalar	550000	100000

Results and Discussion

Coproscopic examination: The prevalence of lungworm in sheep rate seems to be high in Sulaimaniyah province therefore in sheep (15.3%). In sheep the higher prevalence rate was for type of *Muellerius capillaries* that was 7.6% and the lower one was *Protostrongylus rufescens* that was 0.7% and there is difference in the prevalence rate in the study area, therefore the highest rat prevalence was *Muellerius capillaris* in Qaradax that was 14.4% and lowest one was in Bazyan that was 4.3% without any prevalence rate in the Kalar district. The highest prevalence rate of the *Dictyocaulus filaria* was in the clear that was 3.7% and higher one in Kalar was 3% (Table 2).

The prevalence rate of lungworm in goats show high rate with species of *Dictyocaulus filaria*, *Muellerius capillaris* and then *Protstrongylus rufescens* that was 10.6%, 3.8%. 1.9% respectively.

The highest rate of lungworm in goats was *Muellerius capillaris* in Arbat district that was reached to 11.1% and the highest rate of the *Dictyocaulus filaria* in Kalar that was 21.4% (Table 3).

The postmortem study of the lung sample in the Sulamani slaughterhouse shows the total prevalence rate of adult lungworm was 15.1% that is distributed as 11.6% for sheep and 24.6% for goats and the highest rate was *Dictyocaulus filaria*, *Muellerius capillaris* and *Protstrongylus rufescens* that were 7.7%, 6% and 1.4% respectively (Tables 4, 5 and 6).

The prevalence of lungworm infection showed a significant association ($P < 0.05$) with different district where in Bazyan there higher infection by longhorn 8(17.4%) and the lowest infection rate was in Arbat 10(12.6%).

Table (2): Represent the percentage rate of lung worm sp. in Sheep samples

Region	Sample No.	No. of Positive	% of lung worm sp.			Total percentage
			<i>Muellerius capillaris</i>	<i>Dictyocaulus filaria</i>	<i>Protstrongylus rufescens</i>	
Arbat	79	10	8.8	3.7	-	12.6
Qaradax	83	12	14.4	-	-	14.4
Bazyan	46	8	4.3	13	-	17.4
Aghgeler	86	13	10.4	4.6	-	15.1
Kalar	98	17	-	14.2	3	17.3
Total	392	60	7.6	6.8	0.7	15.3

Table (3): Represent the percentage rate of lung worm sp. in goats

Region	Sample No.	No. of Positive	% of lung worm sp.			Total percentage
			<i>Muellerius capillaris</i>	<i>Dictyocaulus filaria</i>	<i>Protstrongylus rufescens</i>	
Arbat	22	3	13.6	-	-	13.6
Qaradax	34	6	-	11.7	5.8	17.6
Bazyan	9	1	11.1	-	-	11.1
Aghgeler	23	4	-	17.3	-	17.3
Kalar	14	3	-	21.4	-	21.4
Total	102	17	3.9	10.7	1.9	16.6

Table (4): The percentage rate of adult lung worm of sheep and goat lung samples in slaughterhouse

Region	Sample No.	No. of Positive	% of lung worm Sp.(Larva)			Total percentage
			<i>Muellerius capillaris</i>	<i>Dictyocaulus filaria</i>	<i>Protstrongylus rufescens</i>	
Sheep	215	42	6	8.3	5.1	19.5
goat	68	18	11.7	14.7	-	26.4
Total	283	60	7.4	9.8	3.8	21.2

Table(5): Prevalence of lungworm in sheep during postmortem examination of lung

Lungworm Specises	Examined	Positive	Prevalence
<i>Dictyocaulus filaria</i>	215	18	8.3%
<i>Protstrongylus rufescens</i>	215	11	5.1%
<i>Muellerius capillaris</i>	215	13	6%
Total	215	42	19.5%

Table (6): Prevalence of lungworm in goats during postmortem examination of lung

Lungworm Specises	Examined	Positive	Prevalence
<i>Dictyocaulus filaria</i>	68	10	14.7%
<i>Protstrongylus rufescens</i>	68	-	Zero
<i>Muellerius capillaris</i>	68	8	11.7%
Total	68	18	26.4%

The present study revealed the presence of nematode species parasitizing the respiratory tract of small ruminants that causes bronchitis and pneumonia with an overall infection rate of 15.5% by coproscopic examination and this disagree with (Ahmed and Rasheed, 2013) that was (0.2%). The present study explain the appear larva in the fecal sample and confirmed by the investigation of the

adult lungworm in the lung. Prevalence rate relatively high for this should be control measures. This study is the first one about the lungworm in small ruminants. In this study prevalence rate was 15.5% in the small ruminants and this disagree with prevalence rate 26.7% in Ethiopia (Weldesenebet and Mohamed, 2012) and the deference may be due to the change in the environmental conditions

like the temperature rate. the highest rate of the lung worm in sheep was in Bazyan that was 8 (17.3%) and lowest one was in Arbat 10 (12.6%) the deference rate between them may be due to the random drenching against the worm that is may be effect on the prevalence rate of the lungworm. Out of 283 lung sample 43 samples were positive in the abattoir the prevalence rate of lungworm in the sheep and goats was 15.1% and this disagree with Ahmad and Rasheed (2013) that was 0.2% in Kirkuk. The prevalence rate of the *Protstrongylus rufescens* in the Sulaimaniyah abattoir was 11(5.1%) and this differs from (Garedaghi *et al.*, 2011) in Tabriz that was 63 of 400(15.6%) this difference may be according to the geographical and climate condition change and the using the Levamizol regularly in Sulaimani province and also there were significant difference between Sulaimani abattoir in *Muellerius capillaries* prevalence rate that was 21(7.4%) while in Tabriz was 25(6.2%).

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