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Research Article

Prevalence of some liver parasites in the slaughtered livestocks in the industrial slaughterhouse of Dezful during 2015

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ABSTRACT:

Introduction: Parasitic infection of livestock is a threat to sources of meat and also a problem for the health of consumers. Due to the geographical location of Dezful and nomadic and livestock life in the area we decided to determine the prevalence of liver parasites in livestock slaughtered at the slaughterhouse of Dezful during 2015.

Method: this study was a retrospective cross-sectional study with reviewing all the files carried in the slaughterhouse of Dezful (47542 files). Data that extracted from files,moved to the designed check lists and analyzed by descriptive statistics and SPSS-16 software.

Results: Results showed the prevalence of F. hepatica 4%, Hydatidosis19.2% and in total, only 33 cases Dicrocoelium dendriticum parasite infectious livestock were reported. A total of 4712.3kg liver of livestock destroyed because of Fascioliasis and 6041.9kg liver due to Hydatidosis infection were not marketed.

Conclusion: The prevalence of these parasites in Dezful region is relatively high. This is likely due to the geographical conditions of the area where can be a safe habitat of intermediate snail. Therefore, cleanup livestock in the area of the pollution and awareness of the evolution of parasites and how human exposure can have an important role in promoting public health.

Keywords: Prevalence; Liver parasites, Livestock, Dezful.

INTRODUCTION:

Protein is one of the main groups of human food. In recent decades, due to the growing population, the need for better and healthier protein sources is felt more than ever. Meat and other animal proteins have a special place in human nutrition(1). Parasitic contamination is a major constraint for livestock production, So that causes reducing weight, fertility, growth and milk production(2). The major parasite lesions observed in the liver of cattle, sheep and goats are caused by 3 species of Fasciola hepatica, Echinococcus granulosus and Dicrosolium dendriticum (3).

Among many parasitic problem of domestic animals, Fascioliasis is a great disease, which imposes a direct and indirect economic impact on livestock production(4). Fascioliasis is caused by two parasites: Fasciola hepatica and

Fasciola gigantica(5). The climatic and geographical conditions are effective in spreading this parasite(6). This parasite causes common infection in ruminants, wich has many consequences, including many social and economic consequences(7). Fasciola hepatica has a special effect on ruminants, including the reduction of meat, milk and wool production, and also has a significant impact on livestock fertilization(8). Fascioliasis infection in cattle has significant economic losses(9). In Switzerland, the financial lose due to the infection of each cow with Fascioliasis is estimatedabout 376 euros per year(10). It is also estimated that global financial losses due to Fasciola Hepaticais more than $ 3 billion a year(11). More than 17 million people around the world are affected by the Fasciola Hepatica parasite, where humans are most likely affected by ingestion aquatic plants,raw or undercooked liver and drinking contaminated water (10).

Hydatidosis is one of the most common diseases of humans and animals, which is the result of infection before the puberty of the cestod Echinococcus granulosus, whose adult form lives in the intestines of the dog and some carnivores(12). The clinical signs of hydatidosis in animals depend on the number, size and location of cysts. The symptoms of this disease are very limited, because the animal's economic life is short(13). The presence of hydatid cysts in the lungs and the liver are usually asymptomatic and most of the infections are identified in post-mortem inspection. In the event of severe liver contamination, symptoms such as liver failure, progressive weight loss, diarrhea, edema, anemia, jaundice, flatulence, ascites and enlargement of the liver can occur(14). On the one hand, livestock breeding, including sheep, leads to a reduction in their production efficiency, and on the other hand, the continuation of the parasite cycle leads to health hazards in humans. Recording and destroying contaminated organs in slaughterhouses, including the liver, kidneys, lungs, brain and other organs, causes economic losses and reduces the protein production(15). Echinococcus granulosus parasite can also limit human life, leading to hepatotoxicity, pulmonary edema, and fatal anaphylactic shock(16). This parasite is one of the five common parasites in the Mediterranean(17) And Iran is an endemic or hyper-endemic region for hydatidosis(18). It is estimated that the human and animal losses of hydatidosis are 1918318955$ and 2190132464$, respectively(19).

Dicrocoelium dendriticum is also a termatod with global expansion. Mature worm lives in mammalian bile ducts, especially ruminants and has a complex life cycle. Also, dicrosolium dendriticum has two intermediate hosts: snails and ant, and humans are accidentally infected with this parasite(20,21). The high prevalence and high economic losses caused by dicroceliasis have made it one of the six major contaminations of ruminants in the world(22). The chronic infection of livestock with dicorosolium dandriticum causes progressive liver cirrhosis and reduced livestock production. The histopathologic effects of dicroceliasis in the liver have been confirmed as necrosis and biliary prophylaxis, calcification and liver fibrosis(23). dicorosolium dandriticum causes other infectious diseases in infected hosts. In the sheep of the Mediterranean region, reducesmilk production 66% in sheep and 18% in goats (24).

Monitoring slaughterhouses and investigating the records of slaughtered animals can help assessing the status of infectious diseases(25,26). Due to the specific weather conditions of Dezful and Khuzestan plain, which is a very suitable area for the growth of intermediate hosts of these three parasites, and the economic and health problems caused by these worms, as well as the lack of clear statistics on the prevalence of these three parasites in the area, we have done the following research.

METHOD:

The present study is a cross-sectional and retrospective descriptive study. The statistical population of this study is all slaughtered animals in the industrial slaughterhouse of Dezful in 2015. The researchers went on to sample the veterinary department of Khuzestan province. Selected samples included all cases of parasitic infections in the liver including:

Fascioliasis, hydatidosis, dicroceliasis, and cases of cysticercosis. The contamination of the samples was documented by the veterinarian and the contaminated meat inspection technician. The inspections carried out included the complete observation of the contaminated organ and also the creation of specific cutways in the target organ. Most of the contaminations are detectable by macroscopic observation, but suspicious specimens were sent to the laboratory for microscopic examination and a definitive diagnosis was made. After extracting the data from the files, the researchers entered and categorized them into certain checklist, then analyzed by descriptive and inferential statistics and SPSS statistical software.

Findings:

The findings of this study showed that a total of 47542 livestock were slaughtered in the industrial slaughterhouse in Dezful during 2015. Of this amount, 4474 cows and calves, 2287 buffalo, 29,247 sheep, 11480 goats and 54 camels were slaughtered. A total of 2032 (4.27%) cases of local records and 1913 (4.20%) cases of total record of the liver infected with Fascioliasis was reported. The study showed that 5326 (11.2%) cases of local record of liver and 3835 (1.8%) cases of total record of livers due to infection with hydatidosid was done.

And only 33 cases of liver contamination with dicroceliasis have been reported with complete liverrecord. No cases of cysticercosis have been reported in slaughtered livestock. Other information is shown in the Table 1.

Table 1: prevalence of liver parasites by livestock

Variables	Cow &calf	Buffalo	Sheep	Goat	Camel	Total
Liver- fascioliasis-local record(N)	676	472	557	327	0	2032
Liver- fascioliasis-total record (N)	642	367	556	348	0	1913
Liver- hydatidosis-local record (N)	580	294	2910	1542	0	5326
Liver- hydatidosis- total record (N)	300	43	2299	1193	0	3835
Liver- Dicrocoeliasis- total record (N)	18	9	4	2	0	33

The Chi-square test did not show any significant difference between the local and total recording of fascioliasis with the livestock type (P = 0.11). However, this test showed a significant relationship between local and complete liver recording of hydatidosis with livestock type (P = 0.0001).

The results of this study also showed that 4712.3 kg of livestock were exterminated due to fascioliasis and 6041.9 kg of liver were not released due to the hydatidosis. Other information on the weight of infected liver is shown in Table 2.

Table 2: information on the weight of infected liver

Variables	Cow&calf	Buffalo	Sheep	Goat	Camel	Total
Liver- fascioliasis-local record(Kg)	338	236.5	140	81.75	0	796.3
Liver- fascioliasis-total record(Kg)	1921	1102	550	343	0	3916
Liver- hydatidosis-local record(Kg)	300	150.1	747.5	395.3	0	1592.9
Liver- hydatidosis- total record(Kg)	878	129	2268	1174	0	4449

DISCUSSION:

According to the results obtained from this study, it can be inferred that the prevalence of Fasciola hepatica in the livestock of Dezful city in 2015 is 8.2%. Moshfe et al. Also reported the prevalence of this parasite in the years 2001-2002 in Yasuj, 9.5% and 9% respectively, which is along with our study(1). Manochehri Naeini

and Bagheri's study(quoted by Moshfe) in 2000 showed that the incidence of livestock slaughtered in the slaughterhouse of Shahr-e-Kurd was 1.4%, due to the lower level of this pollution in Shahr-Kord, can be attributed to the different weather conditions of the two cities (1). However, in a study by Radfar et al., Which took place in Rudsar in northern Iran between 2011 and 2012, the prevalence of infection with fascioliasis among slaughtered cattle in the slaughterhouse was 20.14%, indicating a high prevalence of this infection in northern Iran due to favorable weather conditions for growth of intermediate snails(27). In a Maleki research (quoted by Changizi), the prevalence of livestock contamination in Khuzestan was 82% and Islami (quoted by Changizi), reported this pollution in the city of Dezful in 1988about 31%(28). Reducing pollution in this city from 31% to 8.2% during the years 1988 to 2015 shows the improvement of the level of health in the city and the effectiveness of the struggle against this parasite with regard to appropriate weather conditions for the intermediate hosts. Sissay et al. reported the prevalence of Fasciola hepatica in slaughtered sheep in in the east of Ethiopia about 26% in 2003-2005(4). In our study, this infection was 3.8% in sheep, which is considerably less than Ethiopia, which can be due to the low level of health in that area. The Sissay study reported a 3% incidence of fascioliasis in goats (4) while, contrary to our expectation, this was 5.8%.

The present study showed that total hydatidosis infection in slaughtered animals was 19.2%. In the study of Mehrabani et al. in Shiraz, the incidence of hydatidosis in sheep liver was 2.09%, goats were 2.17%, 4.49% in cattle and 4% in buffaloes(18). In our study, the total number of both total and local recording in sheep was 17.8%, in goats 23.8%, 19.6% in cattle and buffaloes was 14.7%. This significant difference in the prevalence of hydatidosis can be attributed to the significant difference in health level between these two areas and better strategies in Shiraz to control the prevalence of this parasite. Interestingly, in this study, more goats are infected with Echinococcus granulosus, it is true that this parasite is more prevalent in the goats, but the lower prevalence of this parasites was expected due to the fact that these animals were slaughtered at an early age. Of course, the weather conditions in these two regions should not be overlooked. Also, in the study by Chalechale et al, the prevalence of hydatidosis in slaughtered animals in Kermanshah between 2009 and 2014 was 6.35%, which was attributed to the adverse weather conditions of the region for intermediate hosts (29). A study by Scaler et al in 2006 shows that the prevalence of the disease in the Sardinia region of Italy is 75%(30).

In the present study, the rate of infection with dicorosolium dendriticum in cattle and calves was 0.4%, buffaloes 0.39%, sheep 0.01% and in goats 0.01%. In the study of Borji et al. that occurred between 2006 and 2011 in Ahwaz, the prevalence of dicorosolium dendriticum in cows, sheep, goats and buffalales was 0.2%, 0.2%, 0.3% and 0.2%, respectively, in line with the results of our research (3). In the study of Changizi in Langrood, in 2001, the infection in cows, buffalos, sheep and goats was reported 2.42, 6.25, 12.5 and 85.3%, respectively. It shows a lower incidence of this parasite in Dezful than Langroud(28). In the study by Godara et al in Jammu province, India, the prevalence of dicorosolium dendriticum between 2010 and 2011 was 18.9% in slaughtered goats, which was higher than our research results, indicating poor health status and the absence of ongoing veterinary surveillance in the region(31).

Our study indicates that Fasciola hepatica and Echinococcus granulosus are more common in Dezful livestock than others, which also increases the likelihood of human infection through livestock. With the studies done in different parts of the world, the rate of infection with Fasciola hepatica is significant and the prevalence remains high. So efforts have been made to make the vaccine, but no vaccine that has a significant effect on the parasite has been made yet, although the only effect of the vaccine itself was to reduce the damage to the liver (32, 33). Destroying of infected carcasses in a hygienic way, prevention of smuggling livestock, training of dog owners in the field of

proper nutrition and raising general public awareness are among the actions that can be taken to reduce the prevalence of these parasites.

CONCLUSION:

Considering the high prevalence of these three parasites, actions to promote public health and raise awareness of the population are suggested. The level of human infection in each region requires careful study. Due to the diseases that these parasites cause, it is necessary to pay particular attention to these parasites.

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