

Prevalence of Cystic Echinococcosis in Slaughtered Sheep and Goats in Ahar Abattoir, Northwest Part of Iran

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Summary

The aim of this study was to investigate the prevalence of cystic echinococcosis (CE) of slaughtered sheep and goats in Ahar Abattoir, Northwest of Iran. Out of 7.868 slaughtered animals examined for CE (hydatidosis) in liver and lungs (7.654 sheep and 214 goats), 25.40% were infected. The rates of lungs and liver CE were 15.28% and 6.08% in sheep, respectively, and 19.15% and 10.28% in goats, respectively. The infection rate was higher in lungs and was more pronounced in goats. Existence of infected stray dogs in grassland and ruminant grazing on infected pasture are two main reasons for high infection rates in Arasbaran region.

Keywords: *Cystic echinococcosis, Hydatidosis, Sheep, Goat, Iran*

Ahar (İran'ın Kuzeybatısı) Mezbahasında Kesilen Koyun ve Keçilerde Kistik Ekinokozisin Yayılışı

Özet

Bu çalışmanın amacı, Ahar (İranın Kuzeybatısı) Mezbahasında kesilen koyun ve keçilerde hidatidozun yayılışını incelemektir. Kesimi yapılan 7.868 hayvanın (7.657 koyun ve 214 keçi) karaciğer ve akciğerleri hidatidoz yönünden muayene edildi ve %25.40 enfeksiyon oranı saptandı. Akciğer ve karaciğer kistik ekinokozisi (hidatidoz) sırasıyla koyunlarda %15.28 ve %6.08, keçilerde ise %19.15 ve %10.28 oranındaydı. Enfeksiyon akciğerlerde ve keçilerde daha yüksek orandaydı. Meralarda infekte başıboş köpeklerin bulunması ve ruminantların infekte meralarda beslenmeleri Arasbaran bölgesinde saptanan yüksek hidatidoz oranının iki temel nedeni olarak kabul edilmektedir.

Anahtar sözcükler: *Kistik ekinokoz, Hidatidoz, Koyun, Keçi, Iran*

INTRODUCTION

Inspection records of the slaughtered animals have been used as useful sources for evaluation of the epidemiological aspect of certain diseases in several countries ^{1,4}. Cystic echinococcosis (CE) is a disease which cause considerable economic loses and public health problem. Hydatid cyst is the larval form of *Echinococcus granulosus* in intermediate hosts. CE (hydatidosis) of

livestock animals causes in decreasing of their production such as meat, wool and milk and thereby high economical loses ². Furthermore, the infected organs of the slaughtered animals are being condemned. Since CE is a zoonotic disease, and it is a matter of health, in many countries there are special programs to control and defeat the disease ⁵. The reports have

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shown that the incidence of CE in animals in Mediterranean and Middle East is high ^{6,7}. In Iran, CE is one of the major infectious zoonotic diseases, where sheep, cattle, buffaloes and goats are still slaughtered traditionally and carcass wastes are easily accessible to stray dogs and other wild carnivores ⁸. Based on the reports of abattoirs indicate that the infection rate of CE in sheep and goats (especially in sheep) in the west part of Iran is considerably higher than the central parts ^{9,10}. In previous reports, CE in liver and lungs of slaughtered sheep and goats has been reported in the high rates in Northwestern Iran. Daryani et al. ¹¹ have reported that hydatid cyst had been detected in 74.4% of in liver and lungs of slaughtered sheep in Ardabil abattoir, Northwest of Iran. Sheep is the main farm animal because of existence of wide grasslands in Northwestern Iran. Goat population is less than other livestock in this region and reported CE rate in native goats is lower than sheep ¹¹. Ahar abattoir is located in Northwest of Iran (in Arasbaran zone), where animals of five suburban cities are taken there to be slaughtered. The aim of this study was to inform about liver and lungs CE of sheep and goats slaughtered in Ahar abattoir, because little information is known about CE in sheep and goats in the region.

MATERIAL and METHODS

This study was carried out prospectively in Ahar Industrial Abattoir (Northwest of Iran - Arasbaran zone) from 20 March 2007 to 19 March 2008. During the study, all organs (especially internal organs such as liver, lungs, spleen, heart and urinary system) of the slaughtered animals (7.654 sheep and 214 goats) that

were adult and indigenous to the area and originally from small farms in the village and towns (Ahar, Kaleibar, Horand, Meshkin and Varzghan), was inspected by two veterinarians for hydatid cyst. Then, the organs were examined carefully with palpations, and the organs and cysts were cut with knife for confirmation to diagnose. Daily numbers of the slaughtered animals and their organs with the cyst were recorded. To be sure about the validity of recorded data, observed data were entered into a spreadsheet using Excel software (Microsoft, USA).

RESULTS

CE (hydatidosis) data of slaughtered sheep and goats are presented in [Table 1](#).

In this study, liver and lungs of 7.868 slaughtered animals (7.654 sheep and 214 goats) examined for CE, and the infection was detected in 25.40% of the animals ([Table 1](#)). The infection rate in lungs was higher in goats (19.15%) than that in sheep (15.28%). Slaughtered goats had more hydatid cyst in both liver and lungs compared with sheep (29.43% and 21.37%, respectively).

Table 1. The number and rates of cystic echinococ detected in liver and lungs

Table 1. Karaciğer ve akciğerlerde bulunan Ekinokok kisti sayısı ve oranı

Animals	Examined (n)	Liver with CE (n; %)	Lungs with CE (n, %)	Total Infection Rate
Sheep	7.654	466; 6.08	1.170; 15.28	21.37%
Goats	214	22; 10.28	41; 19.15	29.43%
Total	7.868	488; 6.20	1.211; 15.39	25.40%

Fig 1. Seasonal CE in slaughtered goats in Ahar Abattoir (%)

Şekil 1. Keçilerde CE'nin mevsimlere göre yayılışı

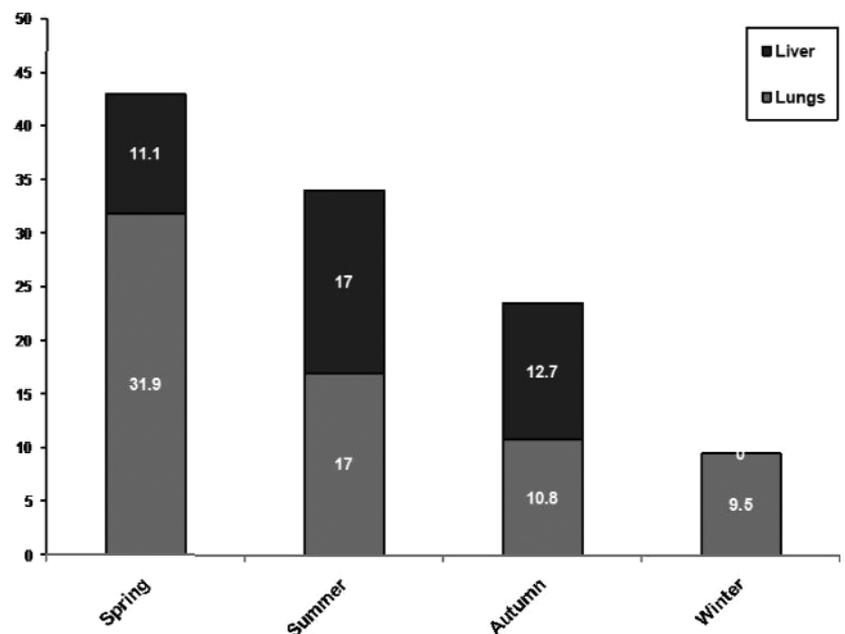
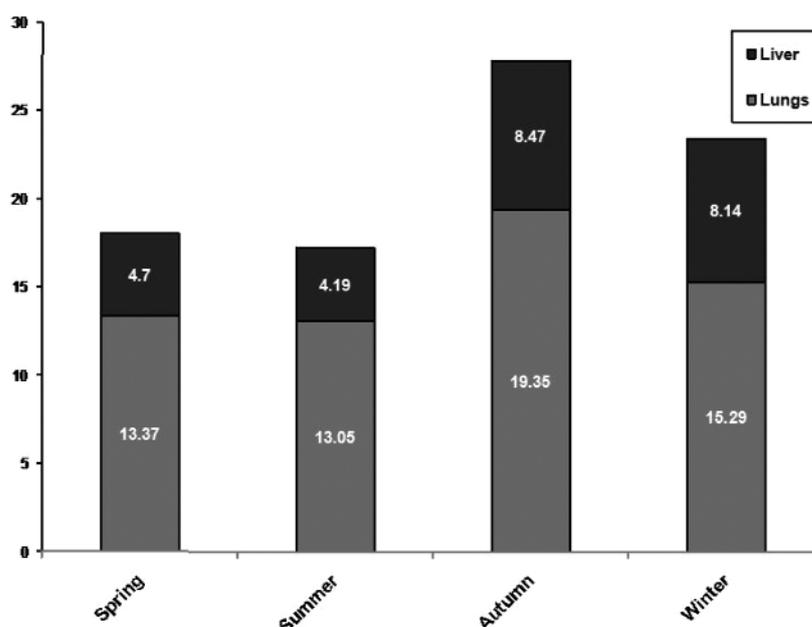


Fig 2. Seasonal CE in slaughtered sheep in Ahar Abattoir (%)

Şekil 2. Koyunlarda CE'nin mevsimlere göre yayılışı



DISCUSSION

Reported CE rates of sheep and goats from west and northwest of Iran were usually high^{9,11-12}. This part of the country is close to the border of Turkey. CE rates in Eastern Turkey and near Iran's border (northwestern Iran) are high, too¹³⁻¹⁵. For example Arslan and Umur¹³ have reported the highest infection rate (71.91%) in slaughtered sheep in Erzurum. Also, Kara et al.⁴ reported from Malatya province of eastern Turkey that hydatidosis in sheep has been in decline recent years (9.1%). Also in Iran, the highest CE rate has been reported in slaughtered sheep in Ardabil (one of the Northwestern city, near to the border) as 74.4%¹¹. Akhlaghi et al.⁹ have reported that sheep is the most infected animal with hydatid cysts in Kordestan province (near to Iran/Iraq border) by infection rate of 51.9%. Almost every reports about animal CE rate from border regions of Iran and Turkey, especially western and northwestern borders of Iran (with Iraq and Turkey) and eastern borders of Turkey (with Syria, Iraq and Iran) mentioned high incidence rate of hydatidosis in small ruminants especially in sheep^{9,11-15}.

In the present study, we found 25.40% infection rate in sheep and goats (21.37% in sheep and 29.43% in goats). Although this rates are less than those in other local studies such as Daryani et al.¹¹ and Movassagh Ghazani et al.¹² but are higher than CE rates reported from central parts of Iran; for instance, Qom city with 9.3% in sheep, 2% in goats¹⁶ and Kashan city with 2.25% in sheep and 3.1% in goats¹⁰. The most infected organ in CE of sheep and goats was the lungs according to Daryani et al.¹¹ and Arbabi and Hooshyar¹⁰. Also in the

study of Fakhr and Sadjjadi¹⁶, the highest infected organ with the cyst (50%) was the lungs that found in goats. Nonetheless, Movassagh Ghazani et al.¹² have reported a high CE rate in livers of slaughtered sheep in North-western of Iran. The results of our study and previous studies^{3,11,17} performed in abattoirs had shown that the most infected organ in sheep and goats was lungs in northwestern and western regions of Iran In overall, in the studies of Dalimi et al.¹⁷ and Ansari-Lari³ that conducted for 3 and 5 years, respectively, in abattoirs of six provinces of the west of the country, lungs were found as the most infected organ with hydatid cyst in sheep and goats.

Some of the studies conducted in Iran also have shown seasonal prevalence of hydatidosis. Ansari-Lari³ has reported that the liver CE was higher in spring and summer in sheep whereas the lungs infection was higher in summer in both sheep and goats. The study of Sharifi¹⁸ that conducted in Kerman (in central part of Iran), has reported the lower CE rates in small ruminants (7.6% in sheep and 9.2% in goats) and no significant difference between the incidence rates in different seasons. In the study of Daryani et al.¹¹, the CE rate in sheep slaughtered in Northwestern Iran (Ardabil) in cold season (autumn and winter) was higher than that in spring and summer (76.8 and 77.5%, respectively). The results of the present study related to seasonal CE of sheep in another Northwestern city were similar to those of Daryani et al.¹¹, but were different from those of Ansari-Lari³. Also according to the study of Daryani et al.¹¹, CE had lower rate in goats that slaughtered in winter that compared with the other seasons. In study

conducted by Ansari-Lari ³, livers of small ruminants had highest infection rate in winter, in compared with the other seasons. In the present study, in winter the liver CE of sheep was higher than the spring and summer rates (Fig. 1), but slaughtered goats did not have any liver CE in winter (Fig. 2).

Because of little information exists about seasonal prevalence of animal CE in Iran, the distribution of animal CE in different regions of Iran is unclear. But the present study and results of Daryani et al.¹¹ and Ansari-Lari ³ have shown that the rate of small ruminant CE in western and northwestern Iran is higher in humid or rainy seasons (spring and autumn) than that seen in other seasons. In Arasbaran, small ruminant feeding is based on pasture forages or grazing in ranges. Because spring and autumn are rainy and humid seasons in general, the grasslands are very rich for animal grazing. On the other hand, close contact of ruminant animals with shepherd dogs in pastures, may help to transmit parasites from infected pasture in these seasons. Also, Iranian shepherd dogs are highly infected by *E. granulosus* ⁸. Existence of infected dogs in grasslands and ruminant feeding by infected pasture may be two main reasons for high infection rates in spring and autumn in Arasbaran region. It is recommended that, a continuous control program for animal CE, limiting the transport of animals across borders (especially in Iran-Turkey border), and feeding in pastures that do not have contacts with dogs can help reduce CE rates in this region.

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