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HYDATIDOSIS: PREVALENCE AND BIOMETRICAL STUDIES IN CATTLE *(BOB INDICUB)*

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The prevalence and biometry of hydatidosis was studied in 5000 cattle of either sex. Magnitude of prevalence was 35.0 %. The hydatid cysts were found in liver (25.31 %), lungs (47.31 %), and spleen (1.83 %). Mixed infection of hydatid cysts was found both in male (23.72 %) and female (26.18 %) cattle in liver, lungs and spleen. Lungs were the most commonly infected organ both in males (29.32%) and females (49.55%). Irrespective of sex, lungs had the highest fertility rate (76.93%) with the highest number and largest size of cysts.

Key words: biometry, hydatidosis, prevalence

INTRODUCTION

Hydatidosis causes a major economic problem in animals in many underdeveloped countries of the world. The infected animals exhibit hydatid cyst formation in various vital body organs like liver, lungs, kidneys, spleen and heart interfering with their vital functions and rendering them unfit for human consumption. Therefore, the organs are condemned and thus a direct loss occurs to the carcass. It has been estimated that the disease caused an annual loss of three million US dollars in Iran (Mutkef et al., 1976); 24 billion lira per year in Italy (Arru et al., 1983) and 20 million US dollars per annum in Greece (Vassalos et al., 1984). In addition to its economic importance, hydatidosis is also a great threat to human health and is responsible for serious illness necessitating surgical treatment (Belschner, 1976).

Since hydatidosis is a world wide problem as such its incidence has also been studied in Pakistan (Munir et al., 1982; Khan and Haseeb, 1984; Iqbal et al., 1989). However, hydatidosis has not been thoroughly investigated in cattle which is a dominating dairy and working animal of the country. This paper reports the incidence of hydatidosis and some related biometrical observations in cattle.

MATERIALS AND METHODS

The investigations were conducted from January, 1988 to December, 1990 at Faisalabad municipal abattoir where animals were brought for slaughtering from various adjoining districts and suburban areas. A total of 5QOO carcasses of indigenous cattle of either sex of different age groups was examined for the presence of hydatid cysts in various body organs to record the prevalence of hydatidosis. The determination of fertility/sterility of the cyst was determined by the method of Calero et al. (1978) along with their size and the number of cysts present in each organ.

RESULTS AND DISCUSSION

Of the 5000 cattle examined, 2860 were males and 2140 females which had a prevalence of 29.93 (856/2860) and 41.77 % (894/2140) of hydatid cysts in various organs, respectively. The rate of infection in both sexes was significantly different ($P<O.Ol$), being lower in males (29.93 %) than females (41.77 %). Irrespective of the sex, an overall prevalence of 35.0 % hydatidosis was recorded.

Predilection seat of Echinococcus metacestodes in different organs revealed that among infected male cattle (856), liver (29.32%), lungs (44.98%), spleen (1,52%), heart (0.12%) and right kidney (0.35%) had hydatid cysts. Mixed infection was recorded in 203 (23.72%) infected males, having cysts in liver, lungs and spleen simultaneously. In infected females (894), liver, lungs, spleen and kidneys had 21.48, 49.55, 2.13 and 0.67 % prevalence of hydatid cysts, respectively. The mixed infection was observed in 234 (26.18%) infected cows. No cyst was found in the heart of cows. Obviously, the lungs were found to be the most commonly infected organ both in males (29.32%) and females (49.55%). The statistical analysis revealed a significantly ($P<0.05$) higher percentage of infection of lungs in both sexes of cattle. The present findings regarding prevalence (35.0 %) of hydatidosis in cattle are comparable to the prevalence of 31.05 % reported in cattle slaughtered at Rawalpindi slaughter house (Pal and Jamil, 1986), 33.0 % (Munir et al., 1982; Iqbal

Table 1: Organ-wise fertility percentage of hydatid cyst in male and female cattle

Orzan	Male (n=856)			Female (n=894)			Both sexes (n=1750)		
	Infected	Fertile	Percent	Infected	Fertile	Percent	Infected	Fertile	Percent
Liver	251	58	23.11	192	33	17.18	443	91	20.53
Lung's	385	295	76.62	443	342	77.20	828	637	76.93
Spleen	13	3	23.08	19	0	0	32	3	9.38
Heart	1	0	0	0	0	0	0	0	0
Kidneys	3	0	0	6	0		9	0	0
Total	856	0	0	894		0	175		

Table 2, Size and number of hydatid cysts in various organs of cattle

Organ	Size in diameter (cm)			Number		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean
Liver	0.5	27.5	9.0	1	755	4.07
Lungs	1.0	32.0	11.21	1	300	6.09
Spleen	0.4	6.3	3.67	1	13	2.03
Heart	0.2	-	0.2	1	-	1,00
Kidneys	0.3	1,5	0.6	1	2	1,35

Table 3, Oraan speer'flcity ofhuydab'dOSISln catt le

Organs	Male		Female		Both sexes	
	Infected (No.)	(%)	Infected (No.)	(%)	Infected (No.)	(%)
Liver	251	29.32	192	21,48	443	25.31
Lungs	385	44.98	443	49.55	828	47.31
Spleen	13	1,52	19	2.13	32	1,83
Mixed	203	23.72	234	26.18	437	24.98
Heart	1	0.12	-	-	1	0.06
Kidneys	3	0.35	6	0.67	9	0.51
Total	856	100.01	894	100.01	1750	100

Mixed = Liver, lungs and spleen affected simultaneously.

et al., 1989). A higher prevalence of hydatidosis (60.6 %) has been reported from Lahore (Maqsood, 1964) and 53.84 % (Rao and Mohyuddin, 1976) at Banglore, India. Higher prevalence has been attributed to a frequent contact between the intermediate and the final host in this area.

The presence of protoscolices attached to the germinal layer in the shape of brood capsule or its presence in the daughter cysts was indicative of viability (fertility) of the hydatid cysts since fertile cysts were considered to propagate the infection. Irrespective of sex, cysts in lungs showed the highest fertility rate (76.93%) which was significantly ($P<0.05$) higher than for other organs (Table 1). These observations are in agreement with Sharma and Chitkara (1963), Gill and Rao (1967\ Hedge et al. (1975), Munir (1980) and Pal and Jamil (1986). Lungs were the common organ which harboured fertile cysts followed by the liver and spleen. The fertility rate of the cyst was not influenced by sex as the lungs of male and female cattle had almost equal percentage of fertile cysts, being 76.62 and 77.20 %, respectively. The male has slightly higher rate of fertile cysts in liver as compared to female. The percentage of fertile cysts in the spleen of male cattle was 16.66 %, while those in female spleen were all sterile. None of the cysts in heart and kidneys was fertile. Higher fertility rate oflung cysts compared to those in other organs has also been reported by Munir (1980), Saad and

El-Abin (1982), Al-Yaman et al. (1985), Singh et al. (1988) and Irshadullah et al. (1989). Hedge et al. (1975), Al-Abbassy et al. (1980), Thompson et al. (1984), Farah (1987) and Sakamoto et al. (1990) reported a higher rate of sterile cysts in lungs.

The results concerning size and number of hydatid cysts in various organs of cattle are shown in Table 2. Lungs contained cysts of larger size (32 cm) followed by those of liver and spleen. The size of hydatid cysts varied from .0.2 cm to 32 cm in different organs. The average diameter of the cysts was 11.2, 9.0 and 3.6 cm in the lungs, liver and spleen, respectively. The maximum number (755) of cysts was found in the liver followed by lungs (300) and the average number of cysts was 6.09, 4.07 and 2.03 in lungs, liver and spleen, respectively. Only one cyst was found each in heart and kidneys. A positive correlation existed between fertility, size and number of cysts in different organs. In this respect the findings of the present study are similar to those of Frankel and Reittman (1970) who described minimum size of cysts as 1 mm and maximum as big as a basket ball. Siddiqui (1979) reported similar type, nature and frequency of the cysts in cattle. Preisly (1956) and Afsar et al. (1971) attributed the variation in the size and number of cysts to the age of the host and the number of *Echinococcus granulosus* embryonated ova swallowed by the intermediate host.

The results of the present study showed that the lungs were the common seat of predilection followed by liver and spleen ..The distribution of the cysts in different organs was not influenced by sex since male and female cattle lungs were almost equally infected with hydatid cyst (Table 3). Similar trend of predilection seat has been reported by Hedge et al. (1975), Islam et al, (1977), Munir (1980) and Pal and Jamil (1986).

REFERENCES

Afsar, A.A., I. Nazarian and B. Baghban. 1971. A survey on the incidence of hydatid cyst in camel in South Iran. British Vet. J. 127 :554.

Al-Abbassy, S.N., KI. Altaif, A.K Jawad and I.N. Al-Saqur. 1980. The prevalence of hydatid cysts in. slaughtered animals in Iraq. Ann. Trop. Med. Parasitol.. 74 :185-187.

Al-Yaman, F.M., L. Assaf, N. Hailat and S.K Abdel-Hafeez. 1985. Prevalence of hydatidosis in slaughtered animals from north Jordan. Ann. Trop. Med. Parasitol.. 79 :501-506.

Arru, E., A. Mantovani and G. Vicari. 1983. Echinococcosis, Hydatidosis and Taeniasis-cysticercosis in Italy. Parasitological Symposium, Lyons :24-26.

Belschner, H.G. 1976. Sheep Management and Diseases, lOth ed. Angus and Robertson Pub., Australia :175-180.

Calero, R.A., B.A. Anguiano, I. Acosta, M. Dominguez and S. Hernandez. 1978. Variation of different components of the hydatid liquid in relation to the organic localization, fertility and viability of cysts. Short communication Section C. Warsaw, Poland :128-129.

Farah, M.O. 1987. Infection rates, cyst fertility and larval viability of hydatid disease in camel, sheep and cattle in Gasim, Saudi Arabia. Res. Communications, 11 :493-495.

Frankel, S. and S. Reittman. 1970. A Text Book of Clinical Laboratory Methods and Diagnosis, 7th ed. Alex Co., Sannenwirth :1724.

Gill, H.S. and B.V. Rao. 1967. Incidence and fertility rate of hydatid cysts in Indian buffalo. Bull. Int. Epizoot. 67 :989-997.

Hedge, KS., A. Rehrnan, G.R. Rajasekharish and M.S. Jagannath. 1975. Study on the incidence of .hydatid disease in animals and human beings in Banglore city. J. Christ. Med. Assoc. India, 50 :296-299.

Iqbal, Z., C.S. Hayat, B. Hayat and M.N. Khan. 1989. Prevalence, organ distribution and economics of hydatidosis in meat animals at Faisalabad abattoir. Pak. Vet. J. 9: 70-74.

Irshadullah, M., W.A. Nizamani and C.N.L. Macpherson.1989. Observations on the suitability and importance of domestic intermediate hosts of *Echinococcus granulosus* in Uttar Pardesh. Indian J. Helminthol.. 63 :39-45.

Islam, A,W.M.S. 1985. Hydatidosis in slaughtered animals in Bangladesh. Pak. Vet. J. 5 :30-33.

Islam, N., H. Rashid and C.B. Cullar. 1977. Hydatid cysts in. bovines, caprines and ovines in Decca (Bangladesh). Ann. Trop. Med: Parasitol.. 71 :239-241.

Khan, D. and M.A. Haseeb. 1984. Hydatidosis of livestock in Pakistan. Folia Parasitologica, 31 :288.

Leoni, A. and L. Marceddu. 1982. Study of the relationship between hydatidosis-echinococcosis in animals and man. Clinica Veterinaria, 105 :307-312.

Maqsood, M. 1964. Echinococcus in bovines. Indian J. Vet. Sci, 16 :283l..

Munir, M.A. 1980. Incidence of hydatidosis in ruminants at Faisalabad abattoir and chemical

characterization of the cyst fluid in buffalo. *MBc.* Thesis, Univ. Agri., Faisalabad.

Munir, M.A, AH. Anwar and AH. Chaudhry. 1982. . The nature and organ specificity of hydatid disease in buffalo *(Bubalus bubalus).* Pak. Vet. J.2 :12-14.

Mutkef, M., AA Minnau and M.M. Lari. 1976. The epidemiological approach to the study of *Echinococcus granulosus* in north east region of Iran. Pahlavi Med. J. 7 :503-557.

Pal, RA and K. Jamil.. 1986. Incidence of hydatidosis in goats, sheep and cattle. Pak. Vet. J. 6 :69-85.

Preisly, H.R 1956. A survey on the incidence of Echinococcosis in sheep. Aust. Vet. J. 32 :61-62.

Rao, D.G. and S. Mohyuddin. 1976. Incidence of hydatid cysts in bovines and histopathological changes. of pulmonary tissue in hydatidosis. Indian J. Anim. Sci. 44 :437-440.

Saad, M.D. and E.AZ. EI-Abin. 1982. The survival rate of protoscolices from hydatid fluid kept at constant temperature. Sudan J. Vet. Res. 4 :157.

Sakarnoto, T., S. Tarn, G.W. Hutchinson, D.B. Coperman, RC.A Thompson and H. Sakamoto. 1990. Studies on echinococcosis in Australia. J. Fac. Agri., Iowa State University, 18 :323-337.

Sharma, T.D. and N.L. Chitkara. 1963. Hydatid disease in Amritsar: A study of potential human risk. Indian J. Med. Res. 51 :1015-1018.

Siddiqui, I.D. 1979. Pathological studies of common lung and liver conditions in buffaloes. M.Sc. Thesis, Univ. Agri., Faisalabad.

Singh, RP., V.K. Drivastava and V.P.S. Deorani. 1988. Hydatidosis in Uttar Pardesh. Vet. Rec. 123 :299-300.

Thompson, RC.A, L.M. Kumaratilke and J. Eckert. 1984. Observations on *Echinococcus granulosus* of cattle origin in Switzerland. Int. J. Parasitol.. 14 :283-291.

Vassalos, M., C. Himonas and A Sarauanos. 1984. Hydatidosis in Greece. Parasitological Symposium, Lyons :24-26.