Pakistan Vet. J., 18 (1): 1998

Q FEVER AND ABORTION IN SHEEP AND GOATS IN JORDAN

Fuad M.M. Aldomy, A.J.Wilsmore[1] and Safi H. Safi
Division of Veterinary Laboratories, P.O.Box 2395, Ministry of Agriculture, Amman, Jordan,
[1]Department of Animal Health, Royal Veterinary College, University of London,
Boltons Park, Potters Bar, Herts, EN6 1NB, U.K.

ABSTRACT

Four hundred and fifty two blood samples were collected from 86 farms of sheep and goats with a recent history of abortion during the lambing and kidding season in 1989-1991 in and around Amman in Jordan. 135 blood samples were collected from sheep and goats which had not aborted. The complement fixation test (CFT) was used for serological examination for Q fever antibodies. 267 (7.9%) of 340 ewes and 8 (7.1%) of 112 aborted does had CFT titres of greater or equal to 1:40 for antibodies to *Coxiella burnetii*. However, antibody titres of 1:20 or greater were found in only 2% of small ruminants that had not aborted. The presence of Q fever antibody titres in small ruminants in Jordan is of importance to public health as well as to livestock production because Q fever is a zoonotic disease.

INTRODUCTION

Q fever caused by *Coxiella burentii* is an infectious but usually symptomless condition of sheep, goats, cattle and other animals. It is transmissible to man in whom it is characterized by sudden onset, fever, chills, profuse sweating, malaise, anorexia, myalgia, and sometimes nausia and vomiting. Most cases recover uneventfully but about 10 per cent become chronic developing endocarditis and occasionally pericarditis. A 59 per cent of 78 British soldiers who contracted Q fever in the period of December 1974 to June 1975 in Cyprus developed pneumonia and of 31 patients tested, 81% had biochemical evidence of hepatitis although only one became clinically jaundiced (Spicer *et al*, 1977).

The incubation period is 2 - 4 weeks. In sheep and goats infection by *C. burnetii* is associated with abortion and stillbirth in sheep and goats (Polydorou, 1981; Khera, 1962).

The serological diagnosis of Q fever as a cause of perinatal mortality in sheep and goats in Jordan led to study the prevalence of Q fever in small ruminants.

MATERIALS AND METHODS

An investigation to find out the prevalence of Q fever antibodies in aborted ewes and does in and around Amman was initiated in September 1989 and continued until March 1991. Information about sex of aborted animals, species, age, date of abortion and date of blood collection were recorded at the time of the farm visit.

Serology

Blood samples were collected by jugular venipuncture from 452 ewes and does of 86 farms with a recent history of abortion. Sera collected were stored at - 20 °C until testing when they were inactivated for 30 minutes at 58-60 °c in a water bath. In the case of paired serum samples, there was a period of one to four weeks between the first and second serum collection. In addition 135 sera were also collected from sheep and goats which had not aborted from 15 of the 86 farms affected by abortion.

Serological test

Complement fixation test (CFT)

The cold CFT method for *C. burnetii* was used. The reagents for the Q fever CFT were from the products of Behring, Behringwerke AG, Marburg. Germany. Q fever antigen was a purified and inactivated suspension of various strains of *C. burnetii* obtained from the yolk sac membranes of infected embryos. The antigen was diluted 1:10 with Veronal Buffered Diluent (VBD). Samples with a titre of 1:20 or greater were considered to be positive. The presence of high titre (1:>40) was taken to indicate recent infection.

RESULT

Positive antibody titres ranging from 1:20 to equal or greater than 160 were found in 41 (12.1%) of 340 aborted ewes and 12 (10.7%) of 112 aborted does. A fourfold increase, in titre (1:>40) between two serum

samples collected at an interval of at least 7 days was regarded as a proof of recent infection which might have caused abortion was noticed in 27 (7.9%) aborted ewes and 8 (7.1%) does as shown in Table 1.

Table 1: Q fever antibody titres in 452 aborting sheep and goats.

Animals	No. with titres > 1:20	No. of increased four fold titres > 1:40
Sheep (n=340)	41 (12.1)	27 (7.9)
Goats (n=112)	12 (10.7)	8 (7.1)
Total (n=452)	53 (11.7)	35 (7.7)

Figures in parenthesis indicate percentage

Result of 86 farms studied showed that 40 had sheep only, 18 had goats only and 28 had sheep and goats. Positive antibody titres were found in 8 (20%) of 40 sheep flock and 4 of 18 goat herds as shown in Table 2.

Table 2: Prevalence of Q fever in farms surveyed in 1989-1991.

Animal Farms	No. of affected	Percentages of affected farms
Sheep (n=40)	8	20.0
Goats (n=18)	4	22.2
Sheep & Goats (n=28)	5	17.9
Total (n=86)	17	19.8

Results of CFT's for Q fever on sera collected from 100 sheep and 35 goats that had not aborted are presented in Table 3.

Table 3: Results of CFT for Q fever on sheep and goats that had not aborted.

Species	Positive CFT for Q fever
Sheep (n=100)	2 (2%)
Goats (n=35)	0 (0%)
Total (n=135)	2 (1.5%)

DISCUSSION

The proportion of sheep to goats sampled in this survey is 3:1 which is similar to the proportions in the total population of sheep and goats in Jordan.

Sera from 27 7.9%) of 340 aborted ewes and 8 (8 (7.1%) of 112 aborted does has CFT titres greater or equal to 1:40 for antibodies to *C. burnetii*. Antibody titres of 1:20 or greater were found in only 2% of small ruminants that had not aborted. The later percentage is similar to that from the national survey which showed a prevalence of 3% in 1988 and 2% in 1989 in apparently healthy sheep and goats (Anonymous, 1989). Schmatz *et al.* (1978) reported an incidence of 12% in domestic animals in Somalia, Egypt and Jordan. However, the prevalence in aborting females was significantly higher (12%) than that of non-aborting females.

Crowther (1976) reported a prevalence of 72% in seropositive aborting group of sheep and goats and 44% in a group with normal parturition in Cyprus. Similarly, Reinthaler *et al.* (1988) recorded a seropositive rate of 53% in goats in the Sudan. By contrast, Little (1983) reported a seroposive rate of only 2.8% in sheep in Britain.

The presence of Q fever antibody titres in Jordan is of importance to public health as well as to livestock production because Q fever is a zoonotic disease, particularly affecting livestock owners and those involved in veterinary services, especially in obstetrical procedures with sheep, goats and cattle. These results may draw the attention of the medical profession to consider Q fever in patients with febrile disease. Human cases of Q fever may be contracted by inhalation of contaminated dust, handling infected materials, possibly by drinking milk contaminated with *C. burnetii* and in some instances by blood transfusion (Woodward, 1987). Biberstein *et al.* (1974) reported that 82% of cows were seropositive and 23% were shedding the organism in milk in California, U.S.A. Therefore, milk from infected domestic livestock should be pasteurised or boiled.

ACKNOWLEDGMENTS

The authors wish to express their appreciation to Dr. Frank Schenkel, Manager of VEEP for his support in carrying out this investigations.

REFERENCES

Acha, P.N. and B. Szyfres, 1987. Q fever. Zoonoses and Communicable Diseases Common to Man and Animals. 2nd ed. Pan American Health Organisation. Sci. Pub., 503: 261-267.

Anonymous, 1989. Department of Animal Prod. and Hlth., Ministry of Agric. Amman, Jordan, pp: 7.

Biberstein, E.L., D.E. Behymer, R.B. Bushnell, G.L. Crenshaw, H.P. Reimann and C.E. Franti, 1974. A survey of Q fever in California in dairy cows. Am. J. Vet. Res., 35: 1577.

Crowther,R.W., 1976. Abortion in sheep and goats in Cyprus caused by *C. burnetii*. Vet. Rec., 99: 29-30.

Khera, S. S., 1962. Rickettsial infection in animals: a review. Indian J. Vet. Sci., 32: 283-301.

Little, W. A., 1983. Q fever-An Enigma. Br. Vet. J., 139: 277-283.

Polydorou, K., 1981. Q fever in Cyprus. A short review. Br. Vet. J., 137: 470-477.

Reinthaler, F.F., F. Mascher, W. Sixl and C.H. Arbesser, 1988. Incidence of Q fever among cattle, sheep and goats in the Upper Nile province in southern Sudan. Vet. Rec., 112: 137.

Schmatz, D., H. Krauss, P. Viertel, A.S. Ismail and A.A. Hussein, 1978. Seroepidemiological investigations in domestic ruminants from Egypt, Somalia and Jordan for the demonstration of complement fixing antibodies against rickettsia and chlamydia. Acta Trop., 35: 101-111.

Spicer, A.J., R.W. Crowther, E.E. Vella, E. Bengtsson, R. Miles and G. Pitzolis, 1977. Q fever and animal abortion in Cyprus. Transactions of the Royal Society Of Tropical Medicine and Hygiene, 71: 16-20.

Woodward, T. E., 1987. Rickettsial diseases. Harrison's Principles of Internal Medicine. 11th Ed. Braunwald *et al.* (Eds.) McGraw-Hill Book Company, pp: 747-757.