

Report

Seropositivity for brucellosis in a sample of animals in the Republic of Yemen

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Introduction

Brucellosis is the most important zoonosis in terms of human suffering and is a true zoonosis in that almost all human cases are acquired from animals, in particular goats and sheep. Brucellosis in animals is caused by five of the six recognized species of the genus *Brucella*; four species commonly infect man: *B. abortus*, *B. melitensis*, *B. suis* and *B. canis*.

Brucellosis in animals is common in the Arabian peninsula [1-3]. It is transmitted from animals to humans by ingestion of raw milk, milk products and raw liver, and close contact with animals through breeding, birth, slaughtering and contaminated dust [3-7]. Infection may also be acquired in a number of other ways.

Brucellosis of goats and sheep has been reported in the Republic of Yemen [8,9] as well as human brucellosis [10,11]. *B. melitensis* biotype 2 has been isolated from sheep (the isolate was confirmed by the FAO/WHO Collaborating Centre for Reference and Research on Brucellosis, Weybridge, Surrey, United Kingdom). Furthermore, Falade and Hussein [9] found a high prevalence of brucellosis (2.8%)

among nonnative goats and sheep from Somalia, and Hosie and colleagues [8] found that the prevalence of brucellosis among nonnative goats from Africa to be 5.6% and among nonnative sheep from Africa to be 1.7%. In addition, the seroprevalence of human brucellosis in a recent study in different parts of the Republic of Yemen ranged from 0% to 0.8% [11].

The Republic of Yemen lies in the south of the Arabian peninsula. It has open borders for sheep, goats and camels with Saudi Arabia and Oman, its neighbouring countries. Goat and sheep breeding is more important than cattle and camel breeding in all regions of the country. Goats predominate in poor, desert and mountainous regions and main towns and camels predominate in poor, desert and coastal regions. Sheep and cattle predominate in the more fertile and flat areas. Typically, goats, sheep and cattle are kept indoors or in pens at night and graze in the village or in the streets of the towns by day.

The objective of this survey was to determine the prevalence of *Brucella* seropositivity among animals in different provinces of the Republic of Yemen.

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Materials and methods

Over a 3-month period in late 1992/early 1993, serum samples were collected from indigenous goats, sheep, cattle and camels throughout the Republic of Yemen. Age, sex, clinical history, and date and place of sampling were recorded in a structured data collection form. A total of 5809 samples were randomly selected: 1645 cattle, 105 camels, 2014 goats and 2045 sheep. All sera were tested for *Brucella* antibodies using an enzyme-linked immunosorbent assay (ELISA) for detection of circulating antibodies to *Brucella* species in the serum of the animals. The technique described by the Central Veterinary Laboratory, Weybridge, United Kingdom, 1990 was followed. The central veterinary laboratory of the Ministry of Agriculture, Sana'a carried out the study.

Results

The prevalence rate of serologically positive sera measured by ELISA was 1.3% for goats, 0.6% for sheep, 0.06% for cattle and 0% for camels (Table 1).

Table 1 Prevalence of brucellosis among animals in the Republic of Yemen, 1993

Species	No. tested	Positive	
		No.	%
Cattle	1645	1	0.06
Camels	105	0	0.0
Goats ^a	2014	26	1.3
Sheep	2045	12	0.6
Total	5809	39	0.7

^a $\chi^2 = 16.35, P < 0.001$

Discussion

Zoonoses continue to represent an important health hazard in most parts of the world, particularly in developing countries where they are responsible for considerable expenditure and losses in the health and agricultural sectors [12]. Brucellosis is a classical zoonosis; the major sources of infections remain contact with infected animals or the handling of carcasses. Less frequently it is acquired through food [3-7,13].

This veterinary survey confirms the existence of brucellosis among indigenous animals in the Republic of Yemen. The highest prevalence rate was among goats 1.3%, which was statistically significant ($P < 0.0001$, Yates corrected $\chi^2 = 16.35$) when compared with the prevalence rate among other species of animals tested (0.34%).

Goat breeding is common in all regions of the country and goats provide most of the fresh milk produced locally which is used for human consumption. Human infections may develop in people who are frequently in contact with infected goat herds, goat manure, or who drink goat milk and its milk products. Therefore, the number of human brucellosis cases is expected to increase in the Republic of Yemen as long as the disease persists among goats.

The prevalence rates among goats (1.3%) and sheep (0.6%) were higher than those in Saudi Arabia among indigenous goats and sheep reported by Kiel and Khan; 0.8% in goats and 0.3% in sheep [3]. However, they were lower than those reported in Oman by Mehta and El-Mauli; 6.4% in goats [2]. The prevalence rate of brucellosis in cattle in the Republic of Yemen (0.06%) was lower than those reported in either Oman (3.3%) or Saudi Arabia (3.6%) [2,3].

Conclusion

The survey confirms the presence of *Brucella* species among indigenous animals in the Republic of Yemen and shows a signifi-

cant prevalence rate among goats. The health authorities should recognize this and should be prepared to apply intervention strategies in order to prevent and control brucellosis in the future.

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