

BRUCELLA SUIIS INFECTION AS A ZOONOSIS IN JAVA

A. PRIADI¹, R.G. HIRST¹, M. SOEROSO¹ and C. KOESHARYONO²

¹ Balai Penelitian Veteriner, Bogor.

² Direktorat Jenderal Pemberantasan Penyakit Menular dan Penyehatan Lingkungan Pemukiman, Jakarta.

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ABSTRACT

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To investigate the significance of *Brucella suis* infection as a zoonosis, 221 sera collected from workers at a large abattoir and pig farms, 27 sera from the workers' contact and 300 sera from unexposed hotel were tested for brucellosis using the Rose Bengal Plate Test (RBPT). From 221 sera from workers at the Jakarta abattoir and pig farms, there was a 19.9% reactor rate to brucellosis in the Rose Bengal Plate Test (RBPT). There were no reactors amongst 27 contacts and 300 unexposed controls. The results demonstrate that *Brucella suis* infection is a serious zoonosis in Java. The control of brucellosis in swine is discussed.

Key words: *Brucella suis* infection, zoonosis, abattoir, Java.

ABSTRAK

Priadi A., R.G. Hirst, M. Soeroso and C. Koesharyono. 1992. Infeksi *Brucella suis* sebagai suatu zoonosa di Jawa. *Penyakit Hewan* 24(44): 110-112.

Untuk meneliti signifikansi infeksi *Brucella suis* sebagai penyakit zoonosa, 221 serum yang diambil dari pekerja rumah potong hewan dan peternakan babi, 27 serum dari orang yang berhubungan dengan pekerja tersebut dan 300 serum dari pekerja hotel telah diuji terhadap brucellosis dengan menggunakan uji serologik Rose Bengal Plate Test. Dari 221 serum tersebut di atas, terdapat 19,9% reaktor positif terhadap RBPT. Sampel dari 27 orang yang berhubungan dengan kelompok pekerja rumah potong hewan di atas dan 300 orang yang tak berhubungan semuanya bereaksi negatif terhadap uji serologik RBPT. Hasil ini menunjukkan bahwa infeksi *Brucella suis* adalah penyakit zoonosa yang serius di Jawa. Cara pengendalian terhadap brucellosis pada babi juga didiskusikan dalam tulisan ini.

Kata-kata kunci: *Brucella suis*, penyakit zoonosa, rumah potong hewan, Jawa.

INTRODUCTION

Brucellosis has a worldwide distribution as an infectious disease of both animals and man. In animals, brucellosis is associated principally with abortion, orchitis and epididymitis. The disease in man is characterised by weakness, fever, chills, sweating, joint pains, headaches and general aches (Ray, 1978). Of the brucella species, *B. melitensis* is the most pathogenic for man, *B. suis* might equal or exceed the pathogenicity of *B. melitensis*, *B. abortus* and *B. canis* are less pathogenic for man (Elberg, 1981). Brucella infected herds and animal products are the main source of infection to human beings, where the potential routes of transmission are ingestion, respiration, conjunctival contact and skin contact (Elberg, 1981).

The significance of swine brucellosis as a zoonosis in the United States has been reported (Hendriks, 1971; Buchanan et al., 1974; White et al., 1974; Heineman and Dziamski, 1976). In Australia, *B. suis* infection in man has been reported (Alton and Gulasekharan 1974).

Arambulo et al., (1970) have reported serological evidence of brucellosis in pig slaughterhouse workers in Manila (Arambulo et al., 1970). Serological studies in swine in the past in Indonesia have shown high reactor rates to brucellosis (Scott-Orr et al., 1980). A 15% reactor rate in slaughter pigs and a reactor rate of 0-30% from individual piggeries in Java was recently reported by Priadi et al (1985). As there are no reported cases of human brucellosis in Indonesia this study was undertaken to investigate the significance of *B. suis* infection as a zoonosis in Java.

MATERIALS AND METHODS

Blood samples

Human blood samples were kindly supplied by the Indonesian Health Department. These samples were divided into three groups according to the contact with pigs. Group I of 221 sera were from abattoir workers and pig farm workers. Of these workers, 79 were suspected as being infected with brucellosis by the

Health Department. Group II consists of sera from group I workers' contacts and two of these contacts were suspected of having brucellosis. Sera of group III were from 300 hotel workers with no contact with group I and II and pigs.

Rose bengal plate test

The rose bengal plate test (RBPT) was carried out as described by Alton et al (1975). Briefly, one drop of each serum was placed on to successive wells on WHO haemagglutination plates. To each of the sera, one drop of buffered *Brucella* antigen was added and mixed well. The plate was then put on the rotary agglutinator and read immediately after four minutes incubation. Well with fine agglutination with a definite rim was considered positive.

RESULTS

There was an overall 8.0% reactor rate in the RBPT from the 548 human sera tested.

In group I, of the 79 workers suspected as being infected with brucellosis, 28 (32.9%) gave positive reactions. Of 142 clinically normal workers, 18 (12.7%) had positive reactions. Thus amongst the abattoir workers and pig farmers there was an overall 19.9% prevalence rate. None of the sera from individuals tested in Group II and the unexposed controls of Group III gave positive reactions in the RBPT (Table 1).

Table 1. Serological reactions of human serums in the Rose Bengal Plate Test

Sample	Suspected	Non-suspected	Total
Group I (221)	26/79* (32.9%)	18/142 (12.7%)	44/221 (19.9%)
Group II (27)	0/2	0/25	0/27
Group III	NT	0/300	0/300
Total	26/81 (32.1%)	18/467 (3.8%)	44/548 (8.0%)
Group I :	Pig slaughterhouse workers and pig farm workers		
Group II :	Worker's contacts		
Group III :	Unexposed controls		
*	Number positive in test/number tested		
NT	None tested		

DISCUSSION

The high serological reactor rate amongst abattoir workers and pig farmers by the RBPT is a clear indication that brucellosis is being readily contracted through animal contact. The responsible agent is almost certainly *B. suis* as all of the affected abattoir workers are from a slaughterhouse which exclusively kills pigs.

Furthermore bacteriological studies in animals from this slaughterhouse have shown that around 10% are infected with *B. suis* (Priadi et al., 1985). Serological studies in large commercial piggeries in Jakarta have demonstrated reactor rates of up to 80% by ELISA amongst breeding pigs (unpublished data). Workers on farms in this area also had positive reactions by the RBPT. Thus our finding of high reactor rates to brucellosis in abattoir and farm workers with highly infected herds is consistent with other reports (Hendriks, 1971; Buchanan et al., 1974; Heineman and Dziamski, 1976).

Out of the 79 patients suspected of having brucellosis, only 26 (33%) were confirmed serologically positive by the RBPT. Although the RBPT is considered superior to CFT and the SAT in confirming brucellosis in human (Ooman and Waghela, 1974; Geral et al., 1975), some positive reactors may have been missed. It is more likely that as the symptoms of brucellosis mimic those of many other febrile conditions common in Indonesia including influenza, many of the negative reactors brucellosis-suspected patients may have been misdiagnosed. It is also probable that the 18 reactors from the clinically normal workers may have experienced flu-like symptoms and not considered it abnormal. That there were no positive reactors amongst the 300 unexposed control patients is a convincing evidence for the specificity of the RBPT.

From the already demonstrated high point prevalence rates of brucellosis in swine both at slaughter (Priadi et al., 1985) and in breeding animals and the transmission of the disease to man there is a clear need for the control of swine brucellosis in Indonesia. In the USA in particular, a test and slaughter policy is applied in endemic areas. This is particularly applicable to small foci of infection in individual herds (Neto et al., 1973). To undertake a test and slaughter policy in Indonesia would not be feasible. This is due to the large numbers of animals and herds involved, and the considerable costs in mounting such a programme both in manpower and compensation.

A second more practical option would be the mass vaccination of all breeding animals. However at this point in time an effective vaccine for swine is still unavailable (Ray, 1978). So far studies with killed bacterin have been disappointing (Deyoe, 1972) and only a modest degree of protection has been obtained with endotoxin preparations (Foster and Edens, 1970). In Argentina (Cendro et al., 1978), a numbers of preparations were tried with similar results and in China

the most promising results were recently reported with a living attenuated *B. suis* strain 2 organism, administered either orally or parenterally (Ministry of Agriculture and Forestry Beijing China, 1978).

However, none of these products has found general acceptance in the field. Investigations are currently underway into an improved vaccine along the lines described for other species. Antigens are being sought for incorporation into a vaccine containing such potent immuno-stimulants as trehalose dimycolate and muramyl dipeptide (Winter *et al.*, 1983).

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