Sero-Prevalence of Brucellosis in Pigs in 6 VDCs of Rupandehi District, Nepal

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Abstract

Brucellosis is one of the world's major zoonotic diseases and is still a veterinary, public health and economic concern in many parts of the world. There is less information about the epidemiology of brucellosis in different regions of Nepal. The present study mainly aimed at determining the prevalence of brucellosis in pigs in Rupandehi district, Nepal. For this a cross- sectional study was conducted. Serum samples of 103 pigs were taken from 6 VDCs of Rupandehi district namely Devdaha, Dudhrakshya, Majuwa, Motipur, Parrohoa and Saljhandi. Fresh blood samples were collected from the ear vein of the farm pigs and were centrifuged to separate the serum from the blood. The separated serum samples were transported to NZFHRC laboratory for testing by maintaining proper cold chain condition. In the lab the test was done by qualitative Slide Agglutination Test (SAT). Out of 103 samples 13.59% (14/103) of samples were found to be sero-positive for brucellosis. No significant association was observed between the sero-positive to *Brucella suis* and breed type, sex wise and VDCs wise. But a significant association was observed between the sero-positive to *Brucella suis* with age difference. This study shows an alarming situation not only in the Rupandehi district but also in the public health sector of the country. By implementing strict and appropriate prevention and control strategy as adopted by many developed countries it can be possible to eradicate this disease from Nepal.

Key words: *Brucella*, Epidemiology, NZFHRC, Serum Agglutination Test (SAT), Zoonotic disease

Introduction

Brucellosis is an infectious, contagious, and worldwide spread form of an important zoonotic disease caused by bacteria of the genus *Brucella*. *Brucella* belongs to family Brucellaceae and order Eubacteriales. Various *Brucella* species primarily affects cattle, sheep, goats, swine and dogs and is characterized by abortion or infertility and also affects people and other animal species (Ray and Steele 1979). Human brucellosis is mainly an occupational disease affecting animal caretakers, livestock farmers, artificial inseminators, abattoir workers, meat inspectors and veterinarians due to frequent exposure to infected animals (Corbel 2006). Human brucellosis remains the most common zoonotic disease worldwide, with more than 500,000 new cases reported annually (Pappas et al. 2006). Brucellosis is found worldwide and is more common in countries with poorly standardized animal and public health program (Capasso 2002). The Mediterranean countries of Europe, northern and eastern Africa, Eastern countries, Central Asia, Central and South America are still not brucellosis free (Robinson 2003). Asian countries like India, Bangladesh, Pakistan, Myanmar, China, Thailand, and Indonesia and also from Nepal it has been reported. In sexually mature animals the infection localizes in the reproductive system and typically produces placentitis followed by abortion in the pregnant female, birth of weak piglets, infertility and epididymitis and orchitis in case of male. The other clinical manifestations are spondylitis (inflammation in joints particularly of the lumbar and sacral regions), arthritis, paralysis of hind limbs, and lameness (movement disability) fever,

depression etc. Considering the history of *Brucella melitensis*, the member of the genus recognized, was isolated in 1887 from spleen of patients who died from Mediterranean fever or Bruce's septicemia, later called Malta fever (Bruce 1887). Traum (1914) identified the *Brucella suis* from the fetus of the sow in USA. Rana (2005) found 21.58% sero-positive for brucellosis from 190 samples of pigs in Kathmandu valley. Shrestha et al. (2008) found 17.14% sero-positive for brucellosis in 70 goats and 7.18% sero-positive in 153 samples of pig. Pandeya (2013) found 12.01% sero-positive prevalence of brucellosis in cattle, buffalo and goat of Kailali district, Nepal. No article regarding brucellosis in pigs in Rupandehi district was found. Therefore, the present study is to determine the sero-prevalence of brucellosis in respect to pigs in Rupandehi district.

Materials and Methods

A cross-sectional study was conducted during July-September 2013. A total of 103 blood samples were collected randomly from pigs from different VDCs of Rupandehi district of Nepal. Blood samples (5 ml from each) of 103 pigs were collected. They were kept in cold box and brought to NZFHRC laboratory. The serum samples were obtained by centrifugations which were tested by qualitative Serum Agglutination Test. For Brucella test antigen Humatex Febrile antigens produced by Human Gesellschaft fur Biochemica und DiagnoaticambH, Wiesbaden- Germany was used.

The data collected were analyzed by using MS-Excel 2007 and SPSS 19 (Statistical Package for Social Science).

Results

General prevalence of brucellosis in pigs

Out of 103 pigs sera tested using qualitative slide agglutination test (SAT) 13.59% (14/103) were found to be sero-positive.

Table 1. General prevalence of brucellosis in pigs

Total	Positive	Negative	Positive %
103	14	89	13.59

Sex wise prevalence of brucellosis in pigs

Of the 103 sera samples of pig tested for *Brucella*, 50 were the sera of male pig and 53 sera samples of female pigs.

The females showed high prevalence of 15.09% (8/53) than that of males of 12% (6/50). But there was no statistically significant difference ($p > 0.05$) in sex wise prevalence of brucellosis in pig ($p = 0.647$, $\chi 2 = 0.210$ at d.f= 1).

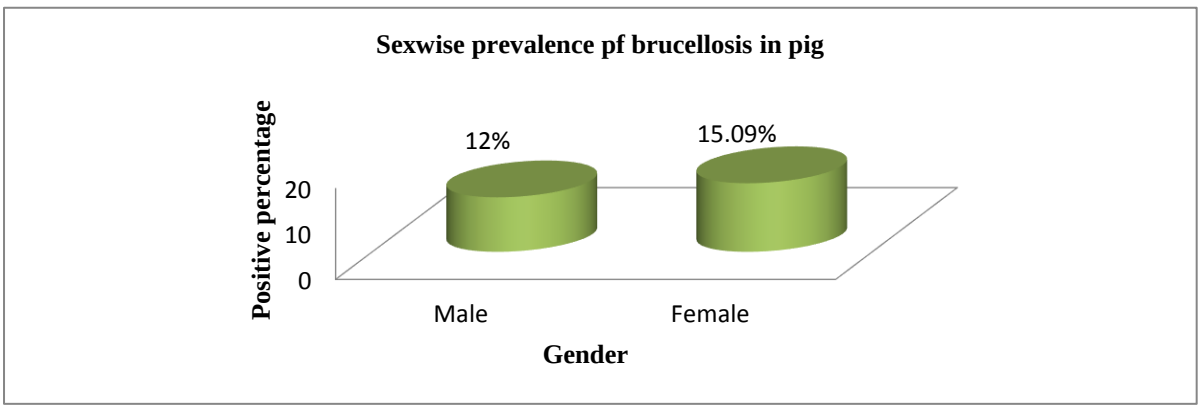

Figure 1. Sex wise prevalence of brucellosis in pigs

Age wise prevalence of brucellosis in pigs

Age group above 9 months showed higher prevalence of positive cases of *Brucella* infection, followed by other age groups (6-9 months, 3-6 months and upto 3 months).

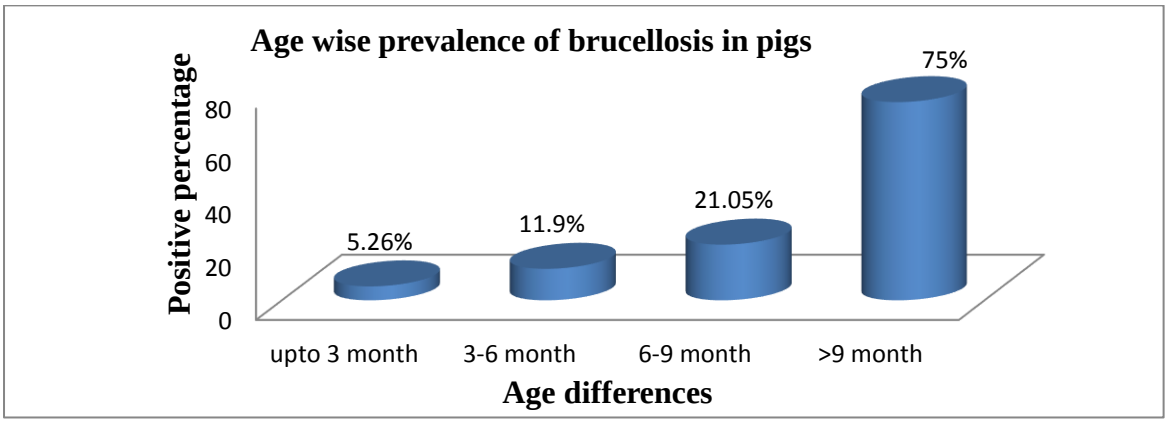

Figure 2. Age wise prevalence of brucellosis in pigs

Statistically significant difference ($p < 0.05$) was found in age wise prevalence of brucellosis in pigs, ($p = 0.001$, $\chi 2 = 16.090$ at d.f =3). This shows that the chances of *Brucella* infection can be increased with the increase in the age of the animal.

Breed wise prevalence of brucellosis in pigs

The highest prevalence of *Brucella* antibody was found in the exotic breed 15.38 % (8/52), followed by 12.19% (5/41) in crossbreed and 10% (1/10) in local breed.

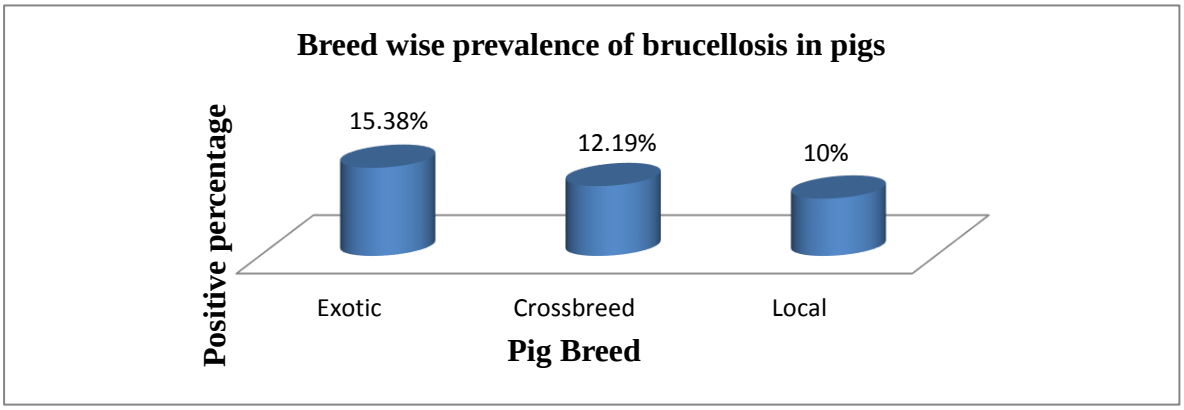

Figure 3. Breed wise prevalence of brucellosis in pigs

No statistically significant difference ($p > 0.05$) was found in prevalence of brucellosis in different type of breed ($p = 0.852$, $\chi 2 = 0.320$, at d.f= 2).

VDCs wise prevalence of brucellosis in pigs

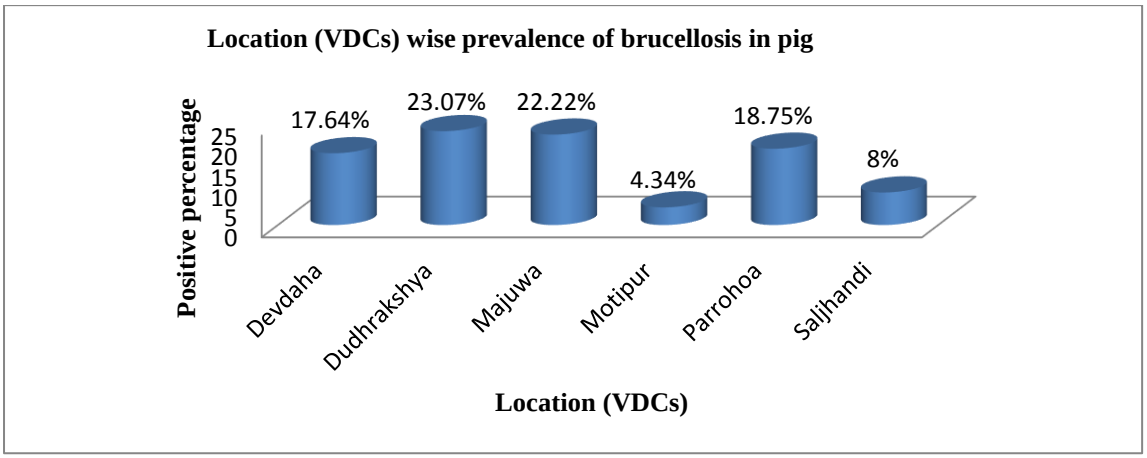

Figure 4. VDCs wise prevalence of brucellosis in pigs

It was found that there was no significant difference ($p > 0.05$) in VDCs wise prevalence of brucellosis in pigs in Rupandehi district i.e ($p = 0.479$, $\chi 2 = 4.506$ at d.f= 5). But comparatively the more positive percentage of the disease was found in Dudhrakshya.

Discussion

According to Shrestha et al. (2008) out of a total of 153 serum samples of pigs from Itahari tested by using the Brewer Diagnostic Card (BDC), 11(i.e.7.18%) were found to be positive for brucellosis. Among them female showed high prevalence 9.23% (6/65) than that of males 5.7% (5/88) which is less than the present finding. This dissimilarity in the results may be due to using different technique of testing.

Rana (2005) collected the serum samples of 190 slaughtered pigs in Koteshwor and Talchhikhel areas in the Kathmandu valley for the serological study of prevalence of brucellosis in swines from June to December 2005. Out of 190 serum samples of slaughtered pigs tested for brucellosis, 41 were found to be positive i.e. 21.58% of the total serum samples tested was found to be positive. The present study result (13.59%) shows that it is quite convincing to the study of Rana (2005). This could be because of using same method of testing.

Dhakal et al. (2005) found 5.36% (3/56) of prevalence rate of goat in Chitwan district which is comparatively lesser than prevalence rate 13.59% (14/103) obtained from this present study. Similarly prevalence rate of buffalo was found to be 2.86% (1/35) which is lesser than prevalence rate found in this study. This could be due to higher sample size as well as due to increment of disease in recent years.

Conclusion

Positive prevalence for brucellosis is quite similar compared to the previous studies of the country. In the present study among the positive cases the age groups of above 9 months pigs were comparatively more affected. Females were more affected than that of males. Exotic breed were highly affected in comparison to crossbreed and local pigs.

Acknowledgements

Authors would like to thank late Durga Dutta Joshi and all the staffs of NZFHRC, Tahachal, Kathmandu for providing lab facilities, guidance and their appropriate support throughout the study. Thanks to Mr Moharaj Paudel and Mr Suraj Baral for helping in data analysis. Special thanks are to all the farmers/stakeholders who supported and contributed their valuable time for providing the samples.

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