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Screening and prevalence of brucellosis in small ruminants in rural areas of Anantapuramu district of Andhra Pradesh

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Abstract

Present study was conducted to know the prevalence of brucellosis in small ruminants under extensive management in the selected villages of sub-urban parts of Anantapuramu district of Andhra Pradesh. Serum samples of sheep and goat were collected from the selected farmers flocks and tested with standard tube agglutination test (STAT). Those animals exhibited agglutination titer > 160 IU were advised to cull the animals and other animals (titer <40 IU) were treated with doxycycline (500 Mg twice a day orally) for four weeks. The study aimed to know the prevalence of the disease in small ruminants. Present study showed that the prevalence of brucellosis is higher in adult sheep than in goats. All the flocks in the studied villages showed sero-positivity. Present study suggests strict control measures for brucellosis in field flocks and needs awareness on zoonotic transmission of brucellosis.

Keywords: Brucellosis sheep, goat, screening, control

Introduction

Brucellosis in small ruminants is endemic in India (Isloor *et al.*, 1998) [1]. Brucellosis is the second most important zoonotic disease in the world after rabies. This disease in animals is also called as enzootic abortion or Bang's disease or rams epididymitis. Brucellosis in animals is caused by bacteria of the genus *brucella* and disease is mainly characterized by abortion in last trimester of pregnancy, retained placenta in females and orchitis, accessory sex gland infections in males. Wide spread of brucellosis infection is present in small ruminants in India. In small ruminants significant reproductive losses are caused by *B. melitensis* and *B. ovis*. *B. melitensis* (Redkar *et al.*, 2001) [1] and it is very contagious to humans (Nicoletti *et al.*, 2013 Pappas *et al.*, 2005) [3, 4]. *B. ovis* is a non zoonotic species, which is an important cause of orchitis and epididymitis in rams but it is not recognized as a cause of natural infection in goats. Brucellosis spreads among animals by contact with the placenta, fetus, fetal fluids and vaginal discharges from the infected animals. The organism is found in blood, urine, milk and semen. *Brucella* can also be spread through equipment and clothing (Banai, 2007) [5]. economic loss is mainly due to abortion, still birth, repeat breeding and infertility Radsitis *et al.* (2007) [9]. The present communication describes confirmation of brucellosis in small ruminants by standard tube agglutination test (STAT) and control by adoption of selective therapeutic approach.

Materials and Methods

Present study was conducted in selected shepherd flocks of four villages of sub-urban Anantapuramu with a history of abortions, lameness, fever and anorexia. The blood samples were collected from jugular vein of each of sheep and goat of selected flocks aseptically using sterile plain vacutainer tubes and needles. The tubes were left tilted over night at room temperature to allow clotting. The sera were separated from clotted blood by siphoning into sterile eppendorf tubes and followed standard tube agglutination test (Sirmatel *et al.*, 2002) [7]. The standard tube agglutination test detects antibodies to the S-LPS and measures the total amount of agglutinating antibodies (IgM and IgG) (Mahajan & Kulashreshtha *et al.*, 1991) [8]. The sheep with STAT titers of 80 IU and above were considered positive and those with antibody titer of 40 IU were considered doubtful. STAT titre value above 40IU were treated as per WHO recommendations for brucellosis; Doxycycline (500 mg twice a day orally) for four weeks as prophylaxis.

Results and Discussion

A total of 1379 serum samples were collected from the selected flocks of sheep and goat of four different villages,

out of which 820 samples are from sheep and 559 samples from goats.

Table 1: The percentage of positive brucellosis sera from different flocks of sheep in sub-urban parts of Anantapuramu (n = 820)

S. No	Name of the flock	Flock size	Samples tested in Rams			Samples tested in Ewes		
			Total	Positive	Positive %	Total	Positive	Positive %
1.	A	210	15	01	6.6	195	28	14.33
2	B	170	12	01	8.3	158	19	12.02
3	C	200	17	02	11.7	183	22	12.02
4	D	240	20	01	5	220	25	11.36

Table 2: The percentage of positive brucellosis sera from different flocks of goat in sub-urban parts of Anantapuramu (n = 559)

S. No	Name of the flock	Flock size	Samples tested in Bucks			Samples tested in Does		
			Total	Positive	Positive %	Total	Positive	Positive %
1.	A	130	9	1	11.1	121	15	12.3
2	B	165	12	1	8.3	153	14	9.1
3	C	144	12	1	8.3	132	11	8.3
4	D	120	10	0	0	110	12	10.9

Table 3: The percentage of positive brucellosis sera from different flocks of sheep & goat in sub-urban parts of Anantapuramu (n = 559)

S. No	Species	Titre value			Prevalence %
		>160 IU	>40 IU	Flock size	
1.	Sheep	99	155	820	30.9
2	Goat	56	67	559	22

In the current study flock level prevalence of brucellosis in small ruminants was estimated in four selected villages of sub urban parts of Anantapur using a standard tube agglutination test (STAT). Off the total 1379 sera samples collected and screened by STAT, 30.9% (n=820), 22%(n=559) were positive for brucellosis in sheep and goats respectively. Higher level of sero prevalence of brucellosis in sheep was observed compared to goat and similar findings was reported 14.6% by Teshale *et al.* (2006)^[9] and lower level of 7.1% by wesinew *et al.* (2013)^[10], 7.01% by Negesh *et al.* (2012)^[11].

In the present study significantly higher level of prevalence (30.9%) of brucellosis was found in sheep under extensive management and it is in agreement with the findings of Smith *et al.* (2009)^[12], Chimana *et al.* (2010)^[13]. The current finding was also in agreement with the observation of Lone *et al.* (2013)^[14] who reported high prevalence of brucellosis in extensive rearing.

Other possible risk factors for brucellosis related to extensive rearing in the sub-urban area include ram sharing for breeding which may result in venereal transmission of brucellosis, this is in agreement with findings of Holt *et al.* (2011)^[15] and Megersa *et al.* (2011)^[16] who reported the risk of transmission of brucellosis significantly increased in mixed sheep flocks. Higher prevalence in the sub-urban areas of Anantapuramu can be correlated with increased density of animals in filed flocks Jamaayah *et al.* (2011)^[17].

Higher prevalence of brucellosis in females than in males may be due to the fact that ewes/does are usually reared for breeding purpose and kept for a longer period without culling even though they have reduced reproductive performances Omer *et al.* (2007)^[18] and Yesuf *et al.* (2010)^[19]. Presence of erythritol in allantoic fluid during pregnancy also favours the growth and multiplication of organisms Omer *et al.* (2007)^[18], Yesuf *et al.* (2010)^[19].

In the current study prevalence was higher in ewes with history of abortions compared to pregnant ewes with no history of abortions Boukary *et al.* (2013)^[20], Mahajan and

Kulshreshtha (1987)^[8].

STAT titer value above 40IU and less than 80IU were treated as per WHO recommendations for brucellosis; Doxycycline (500 mg twice a day orally) for four weeks and screened for the presence of brucella antibodies and found negative for the antibodies.

Conclusion

The result of the present serological surveys showed that brucellosis is an important disease of small ruminants in sub-urban parts of Anantapuramu. Infected sheep and goats were found in all the selected flocks of studied villages. The study showed need for regular screening and culling of infected animals for effective control of the disease in the small ruminants and also prevention of zoonotic transmission to the humans.

References

1. Isloor S, Renukaradhya GJ, Rajashekhar M. Brucellosis research. In annual Report (199-1998) of AICRP on Animal disease Monitoring and Surveillance Bangalore, Indian, 1998, 13-18p.
2. Redkar R, Rose S, Bricker B, Delvechio V. Real-time detection of Brucella in Goat Medicine, Baltimore, Lea and Febiger, 2009, 423-442p.
3. Nicoletti P. Brucellosis in cattle. In Merck Veterinary Manual, 2013. www.merckvetmanual.com.
4. Pappas G, Akritidis N, Bosilkovski M, Tsianos E. Brucellosis. New England journal of Medicine. 2005;352:2325-2336.
5. Banai M. Control of *Brucella melitensis*, Memorias del IV Foro Nacional de Brucellosis, Facultad de Medicina Veterinaria y Zootecnia de la Universidad Nacional Autonoma de Mexico (FMVZ-UNAM), 26-27 November, Mexico, DF, 2007.
6. Veterinary Medicine and Animal Health. 2013;5:358-364.
7. Sirmatel F, Turkur M, Bozkurt AI. Mikrobiyol. Bul. 2002;36:161.
8. Mahajan NK, Kulshreshtha RC. Prevalence of brucellosis due to rough forms of Brucellain sheep, Indian Journal of Animal Sciece3. 2001;57:1287-1289.
9. Teshale S, Muhie Y, Diagne A, Kidanemariam A. Seroprevalence of small ruminant brucellosis in selected

- districts of Afar and Somali pastoral areas of Eastern Ethiopia: The Impact of husbandry practice, *Revue de Medecine Veterinaire*. 2006;157:557-563.
10. Wesinew A, Tesfaye ST, Simenew K. Sero-prevalence of small ruminants abortus, *Brucella melitensis* and *Brucellusuis*, Molecular and Cellular Probes. 2013;15:201-203.
 11. Negash E, Shimelis S, Beyene D. Seroprevalence of small ruminant brucellosis and its public health awareness in selected sites of Dire Dawa region, Eastern Ethiopia journal of veterinary Medicine and Animal Health. 2012;4:61-66.
 12. Smith MC, Sherman DM. Brucellosis, in Goat Medicine, Baltimore, Lea and M.J. Mangen, J. Otte, D. Pfeiffer and P. Chilonda, Bovine brucellosis in sub-Saharan Africa: Estimation of ser-prevalence and impact on meat and milk off take potential, FAO, Rome, Italy, 2002.
 13. Chimana HM, Muma JB, Samui KL. A comparative study of the seroprevalence of brucellosis in commercial and small-scale mixed dairy-beef cattle enterprises of Lusaka province and Chibombo district, Zambia, *Tropical animal Health and production*. 2010;42(7):1541-1545.
 14. Lone IM, Baba A, Shah MM, Iqbal A, Sakina A. Seroprevalence of brucellosis in sheep of organized and unorganized sector of Kashmir valley, *veterinary world*. 2013;6(8):530-533.
 15. Holt HR, Eltholth MM, Hegazy YM, El-Tras WF, Tayel AA, Guitian J. *Brucella* spp. Infection in large ruminants in an endemic area of Egypt: cross-sectional study investigating seroprevalence, risk factors and livestock owners knowledge attitudes and practices (KAPs), *BMC public health*. 2011;11:152-156.
 16. Megersa B, Biffa D, Abunna F, Regassa A, Godfroid J, Skjerve E. Seroprevalence of brucellosis and its contribution to abortion in cattle, camel and goat kept under pastoral management in Borana, Ethiopia, *Tropical Animal Health and production*. 2011;43(3):651-656.
 17. Jamaayah MZ, Heu JY, Norazah A. Seroprevalance of brucellosis among suspected cases in Malaysia, *Malaysian Journal of pathology*. 2011;33:31-34.
 18. Omer MM, Abdelaziz AA, Abusalab SMA, Ahmed AM. Survey of brucellosis among sheep, goat, camels and cattle in Kassala area, Eastern Sudan, *Journal of Animal health and Veterinary Advance*. 2007;6:635-637.
 19. Yesuf M, Alemu S, Temesgen W, Mazengiac H, Negussie H. Seroprevalence of Ovine Brucellosis in south Wollo, North Eastern Ethiopia, *American Eurasian Journal of Agricultural and Environmental Science*. 2010;9:288-291.
 20. Boukary AR, Saegerman C, Abath E. Seroprevalence of potential risk factors for *Brucella* spp. Infection in traditional cattle, sheep and goats reared in urban, periurban and rural areas of Niger, *PLoS ONE*, 2013, 8(12). Article ID e83175.