The Pharma Innovation Journal 2018; 7(4): 863-866

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(4): 863-866

www.thepharmajournal.com
Received: 19-02-2018
Accepted: 23-03-2018

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Seroprevalence of infectious bovine rhinotracheitis in buffalloes of Telangana state

Kirankumar Yarramshetti, Padmaja Katta, Ambica Gadige, N Krishnaiah and Jayasudha Yeleti

Abstract
The present investigation was carried out to study the seroprevalence of IBR in buffaloes of organized and unorganized sectors in all the districts of Telangana state. The data was also categorized into age, sex and breed wise for comparison.
Among the 524 samples collected, 155 were found positive accounting to 29.58%. Organized sector (41.36 %) had significantly ($P < 0.05$) higher seroprevalence compared to unorganized sector (21.05 %). Above 5years age group buffaloes had significantly ($P < 0.05$) higher seroprevalence (34.86%) than the below 5 years age group (9.26%). The seroprevalence of IBR between male (20%) and female (29.77%) was not significant ($P > 0.05$). The seroprevalence of IBR between the GMB (36.73%) and ND Buffaloes (25.30%) was significant ($P < 0.05$).

Keywords: Seroprevalence, infectious bovine rhinotracheitis, Telangana state, buffalloes

1. Introduction
India has the largest population of dairy animals and ranks first in milk production in the world with average milk production of 146.3 million tonnes during the year 2014-15 accounting for 18.5 % of world production (the economic survey 2015-16) [3]. Total Bovine population in India is 299.9 million (19th Livestock Census, 2012). Telangana donates around 2.87% of milk production of the country. Telangana state is having 41.94 lakh buffaloes (19th Livestock Census, 2012).
The disease is primarily associated with three major clinical syndromes, IBR, infectious pustular vulvovaginitis (IPV) and infectious pustular balanoposthitis (IPB). Besides, the virus causes a wide variety of clinical syndromes such as conjunctivitis, abortion, meningoencephalitis and infertility.BoHV-1 is also one of the most important pathogens involved in the development of the respiratory disease syndrome, called shipping fever. IBR is a notifiable OIE disease that includes transmissible diseases that are considered to be of socio-economic importance within the countries and that are significant in the international trade of animals and animal products (Turin and Russo, 2003) [9].

2. Materials and Methods
Serum samples were collected randomly from white cattle and buffaloes of organized and unorganized sectors of all 10 districts of Telngana state. The serum samples were screened to record the seroprevalence of infectious bovine rhinotracheitis in the state of Telangana.

2.1 Seroprevalence
The seroprevalence of infectious bovine rhinotracheitis was calculated by considering total number of samples screened for infectious bovine rhinotracheitis and number of samples detected positive as per the formula.

$$\text{Seroprevalence of IBR (\%)} = \frac{\text{No. of IBR positive samples}}{\text{Total no. of samples screened for IBR}} \text{ X } 100$$

2.2 Collection of Blood
2.2.1 Materials required for blood collection
Blood was collected from buffaloes under aseptic conditions by puncturing the jugular vein

using a sterile needle of 18G and 11/2" into a sterile 4ml serum clot activator tubes.

2.2.2 Methods of collection of blood
Blood was collected by properly restraining the animal and by following aseptic precautions using a sterile needle, the jugular vein was punctured and around 4ml of blood was collected into serum clot activator tube with utmost precaution to avoid haemolysis as suggested by Alleman (1990) [1].

2.2.3 Serum Separation
Collected blood in serum clot activator tubes was kept in slant position at 450 angle so that serum gets separated for 20-30 minutes and if the serum was not separated, then centrifuged the tube in centrifuge at 3000 rpm for 2-3 minutes. The separated serum was transferred into serum collecting tubes (Eppendorf tubes) and the serum was stored at -20◦c in Ultra low temperature freezer for long time till used for test. Proper labelling of the sample was done before storage.

2.3 Processing of serum samples
Serum samples collected were used for conducting Indirect-ELISA. The Indirect ELISA was done at veterinary Biological Research Institute, Hyderabad, Telangana State.

2.4 Statistical Analysis
The data collected was statistically analyzed by employing chi square test as per the methods described by Snedecor and Cochran (1994) [7]. The seroprevalence in white cattle and buffaloes of organized and unorganized sectors were calculated and compared.

3. Results and Discussions
The present investigation was carried out to study the seroprevalence of IBR in buffaloes of organized and unorganized sectors in all the 10 districts of Telangana state using Indirect ELISA.

3.1 Selection of Animals
During the present study, which lasted for 9 months (November, 2015 to July, 2016) a total of 524 serum samples were collected randomly from all the 10 districts of Telangana state including organized and unorganized sectors.

3.2 Seroprevalence of IBR in Buffalloes of Telangana state
Among the 524 samples collected from buffaloes irrespective of organized and unorganized sectors and it is observed that 155 were positive accounting to 29.58 %.The details of seroprevalence of IBR in Telangana was presented in the table 1 and fig. 1.

3.3 Seroprevalence of IBR in Different Farming Sectors
Among 524 samples collected from buffaloes which included 220 from organized and 304 from unorganized farms out of which 91 and 64 were positive accounting 41.36 % and 21.05 % respectively. The seroprevalence of IBR between organized and unorganized sectors was significant ($P < 0.05$). Similarly, Ganguly and Mukopadhyay (2008) [4] reported higher seroprevalence of IBR in organised cattle farms (61.15%) when compared to 23.48% in rural unorganized sectors which differed significantly which may be due to close contact and the transmission of disease is easier and fast among all animals in organized farms. The details of seroprevalence of IBR in different farming sectors were presented in the table 2 and fig. 2.

3.4 Seroprevalence of IBR in Different Age Groups
Among 524 samples from buffaloes that included both below 5years age group (108) and above 5years age group (416) and found 10 and 145 were positive accounting a positive percentage of 9.26 % and 34.86 % respectively. The seroprevalence of IBR between below 5years age group and above 5years age group was significant ($P < 0.05$). The higher seroprevalence of IBR in above 5years age group than below 5years age group in buffaloes was in similar to the findings of Dora *et al.* (2013) [2] in Southern Veracruz, Mexico, who opined that seroprevalence of IBR increased with number of calvings. The details of seroprevalence of IBR in different age groups were presented in the table 3 and fig. 3.

3.5 Seroprevalence of IBR in Different Sex Groups
Among 524 samples collected from buffaloes, which included 10 male and 514 female animals, 2 and 153 were positive for IBR accounting a positive percentage of 20 % and 29.77 % respectively. There was no significant difference in the seroprevalence of IBR between males and females. The seroprevalence of IBR between male and female was not significant in buffalloes of Telangana state. In the present study, sex had no significant role to play in the seroprevalence of IBR, almost similar results were reported by Samrath *et al.* (2016) [5] about 34.98% in females and 32.78% in males and Thakur *et al.* (2015) [8] reported 19.02% in females and 16.22% in males. The details of seroprevalence of IBR in different sex groups were presented in the table 4 and fig. 4.

3.6 Breed wise Seroprevalence of IBR in Buffaloes
Among 524 buffaloes tested, which included 196 GMB and 328 ND buffaloes out of which 72 and 83 were positive accounting to 36.73 % and 25.30 % respectively. The seroprevalence of IBR between the buffalo breeds was significant ($P < 0.05$). The higher seroprevalence in GMB, when compared to ND buffaloes in the present study is may be due to higher number of GMB were present in organized sector where there is more chance of spreading the infection due to overcrowding (van Drunen Littel-van den Hurk, 2006) [10] and lower seroprevalence in ND buffaloes is possibly due to the inherent resistance to infection (Saravanajayam *et al.*, 2015) [6]. The details of seroprevalence of IBR in different farming sectors were presented in the table 5 and fig. 5.

Table 1: Seroprevalence of IBR in buffalloes of Telangana state

Total Samples Tested	524
Positive	155
Negative	369
Positive %	29.58
Negative %	70.42

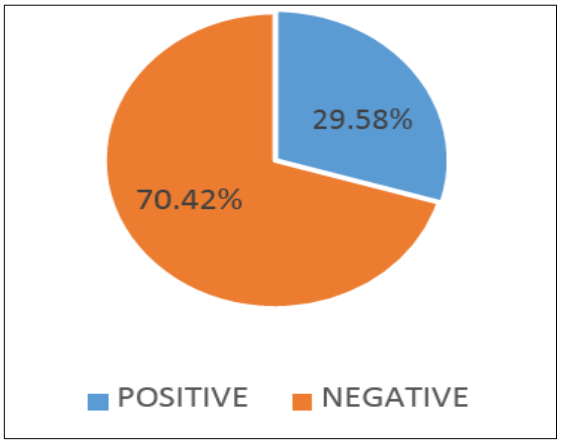

Fig 1: Seroprevalence of IBR in buffalloes of Telangana state

Table 2: Seroprevalence of IBR in different farming sectors

Type of Farming Sector	Tested	positive	% positive
Organized	220	91	41.36
unorganized	304	64	21.05
Total	524	155	29.58

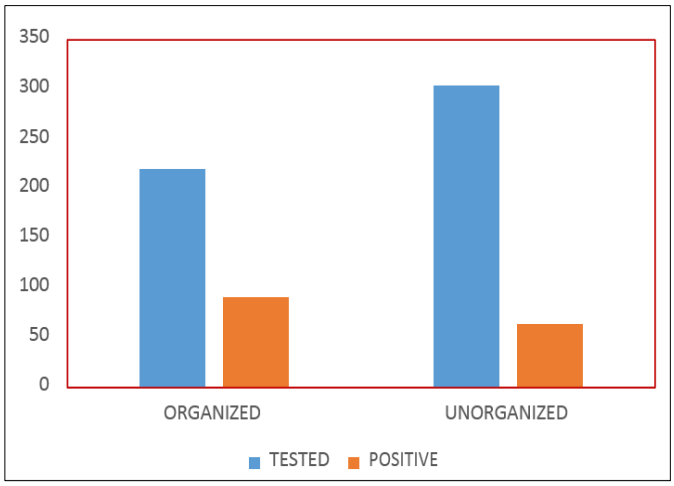

Fig 2: Seroprevalence of IBR In different farming sectors

Table 3: Seroprevalence of IBR in different age groups

Age Wise	Tested	positive	% Positive
< 5 years	108	10	9.26
> 5 years	416	145	34.86
Total	524	155	29.58

Fig 3: Seroprevalence of IBR in different age groups

Table 4: Seroprevalence of IBR in different sex groups

Sex Wise	Tested	Positive	% Positive
Males	10	2	20
Females	514	153	29.77
Total	524	155	29.58

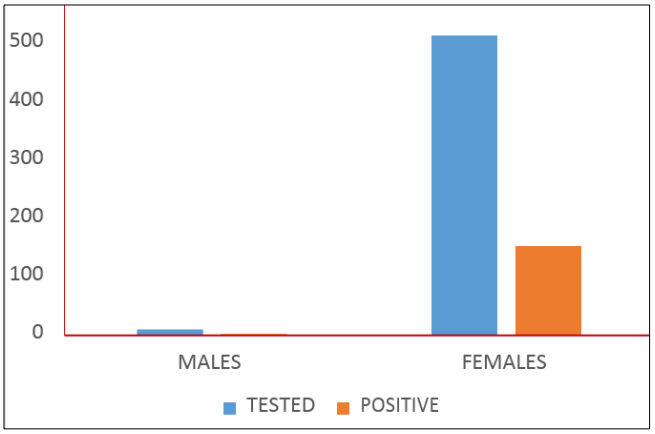

Fig 4: Seroprevalence of IBR in different sex groups

Table 5: Breed wise seroprevalence of IBR in buffaloes

Buffalo Breeds	Tested	Positive	% Positive
Gmb	196	72	36.73
Nd	328	83	25.30
Total	524	155	29.58

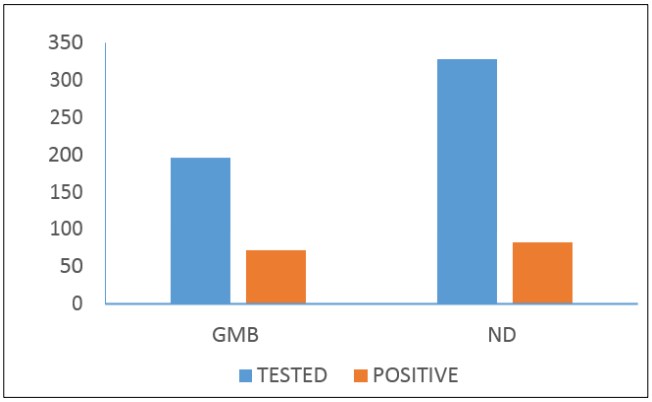

Fig 5: Breed wise seroprevalence of IBR in buffaloes

4. Conclusion

Basing on the present investigation the seroprevalence of IBR in buffaloes of Telangana state was 29.58%. Organized sector (41.36 %) had significantly higher seroprevalence compared to unorganized sector (21.05 %). Above 5years age group buffaloes had significantly ($P < 0.05$) higher seroprevalence (34.86%) than the below 5 years age group (9.26%). The seroprevalence of IBR between male (20%) and female (29.77%) was not significant ($P > 0.05$). The seroprevalence of IBR between the GMB (36.73%) and ND Buffaloes (25.30%) was significant ($P < 0.05$).Hence it can be concluded that factors like farming system, age and breed significantly effects the seroprevalence of IBR though the sex has no significant effect.

5. Acknowledgement

We thank the Director, Veterinary and Animal Husbandry Department, Telangana for permitting me to use Indirect ELISA kits present in Veterinary Biological Research Institute, Hyderabad.

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