



Sero-Prevalence of Toxoplasmosis in Crane and domestic Chicken at District Bannu

Ihsan Ali^{1#}, Mujeeb ur Rahman^{1#*}, Rehmat Islam², Amir Ullah³, Fazal Mehmood Khan⁴, Zahid Khan¹, Haroon¹

¹College of life sciences, Northwest University, Xi'an, Shaanxi 710069, P.R.China.

²School of Life sciences, Biomedical Engineering, Northwest polytechnical University, China 710069.

³Department of laboratory Medicine, Southern Medical University, Guangzhou, 510515, Guangdong, China.

⁴Key laboratory of special pathogen and Biosafety, Center for emerging infectious diseases, Wuhan instate of virology, Chinese Academy of Sciences, Wuhan, 430071, China.

^{1*}Corresponding author's Email: mujeeb@stumail.nwu.edu.cn

[#]Both authors contributed equally to this work.

ABSTRACT

Chickens and cranes are increasingly recognized as an essential source in the transmission of Toxoplasma gondii (T. gondii). The purpose of this study was to investigate the presence of T. gondii in the bird and chicken and the relationships between the infected hosts (carrier) and other mammals. Rapid diagnostic kits for Toxoplasma in humans were used for the detection of antibodies in chickens and crane serum. A total of 150 birds (Crane and domestic Chicken) were selected for the detection of Toxoplasma gondii from district Bannu. Out of these 100 were crane and 50 were domestic chicken. This study was conducted in different areas of district Bannu from December 2013 to January 2014. The blood was collected in sterilized lab conditions and further processed in the lab for serological tests. There was zero percent prevalence in both cranes and domestic chickens. The results indicate that only the molecular base technique should be used for such kind of finding. The diagnostic procedure must be DNA dependent technique.

Keywords: Seroprevalence, Toxoplasma gondii, Domestic chicken, Cranes, Rapid Diagnostic Kit,

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INTRODUCTION

Toxoplasma gondii is an intracellular zoonotic protozoan parasite, infect both humans and animals population worldwide. This infection is transmitted by using raw meat and deeply contact with cat faecal materials holding oocytes. It can cause abortion and CNS disease in humans and livestock populations [1, 2]. Approximately 25% of the population has transported this parasite worldwide [3]. The most common infection, worldwide 6 billion peoples have been suffered from this infection [4]. Other investigation shows that one-third of the humans' population is documented to transfer the toxoplasmosis worldwide [5]. Warm and humid regions have a high risk of prevalence of toxoplasmosis. *Toxoplasma gondii* can effects livestock production deeply. [6]. It even can infect the birds, chicken, crane and other domestic animals and leadsto many serious illnesses. *Toxoplasma gondii* cysts have been recognized in various infected cattle tissue like ribs muscles, brain, liver, tongue, and heart [7];[8]. Toxoplasmosis can infect small ruminants as well as adult animals. In Pakistan, goats and sheep, cows, buffalo are considered a vital source of income but other than that bird's crane in peasantry in the zoo and domestic chicken in houses and farms are also considered the source of income and meat. Studies carried out in southern parts of the country have diagnosed the prevalence of *T. gondii* in chicken and crane [9, 10].

Keeping in mind the significance of the infection, a survey was carried out on the prevalence of *Toxoplasma gondii* infection in domestic Bird and in crane District Bannu Khyber Pakhtunkhwa (KP), Pakistan.

MATERIAL AND METHODS

Study area

The present survey was carried out in district Bannu region KP, Pakistan. It is located in between the 31.280 North latitude and 73.250 East longitudes. It occupies a total area of 1,227 square kilometers, and the total human population is 677350 with annual growth rate is 2.8%, respectively. The climatic condition is 480 C in summer and 60 C in the winter season. About 45% area is irrigated through canal systems and the remaining area is dependent upon the rainfall.

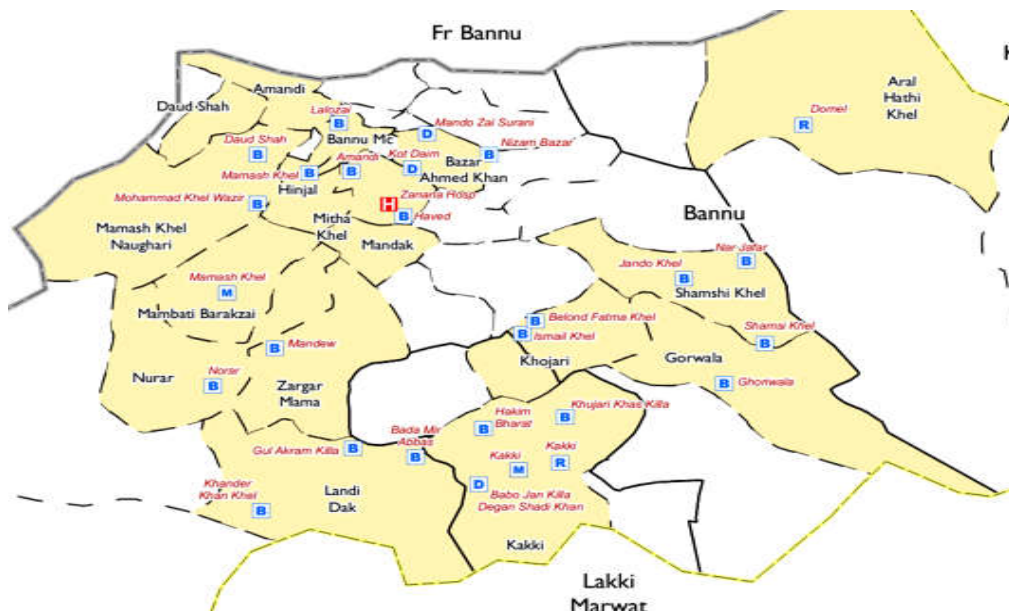


Figure 1. Map showing the location of Bannu District KPK.

Sample collection

The blood samples were collected by a simple random sampling method. At the time of blood collection, information was collected on a printed proforma by a direct interview from the owner of the crane. Blood Sample of 2-3ml was taken normally from a superficial vein by a sterile disposable syringe preferably. Blood from syringes was transferred to blood collecting sterilized tubes. These tubes including blood were placed in the box and transported to the lab in sterilized conditions for the investigation of serum antibodies. Serum from blood was extracted by centrifuge at the speed of 3500rpm for 5 minutes.

Sample processing

A simple RDK (rapid diagnostic kit) was used for IgM and IgG antibodies.



Figure 2. Rapid Diagnostic Device

RESULTS

A total of 150 samples 100 from cranes and 50 from domestic chickens were obtained. These samples were taken randomly from different localities of district Bannu, KPK. The age range of crane was from six months to 90 years while in domestic chicken it was about 8 months to 3 years. Mention in table 1 and table 2 Agevice and area vice respectively.

SN.	Age ranks	Total number of sera tested	Number of positive sera	Sex	Area
1	1Month-11Month	08	0	Both	Pai Khel Mandan & Zafar Khel Daud shah Bannu
2	01Year-05Year	19	0	Both	Jogi kula Mandan & Menak khel Merh khel Esaki Bannu
3	06-10	11	0	Both	Sabo khel&Pai khel Mandan Bannu
4	11-15	06	0	Both	MenakkhelMerhkhel Esaki &ImaroMandan Bannu
5	16-20	07	0	Both	Sarwar Fateh khel&KotkaFeroz Fateh khel Bannu
6	21-25	05	0	Both	LalisherMandew&Kotka Mir AlamDaud Shah Bannu
7	26-30	03	0	Both	LalisherMandew&Gara Baber Bannu
8	31-35	07	0	Both	LalisherMandew&TarhaWola Ghorl Wala Bannu
9	36-40	10	0	Both	Sabo Khel KhattakKhel &Kausar Fateh Khel Bannu
10	41-45	04	0	Both	KotkaShiekhanMandan & Zakir khelSurani Bannu
11	46-50	09	0	Both	Mastikhel, Gala khelDaud shah &KotkaEidekChayGhariMameshkhel Bannu
12	51-55	05	0	Both	Shamadi Kula &Nurar Bannu
13	56-60	02	0	Both	Jhangi khan Daud shah Bannu
14	61-65	02	0	Both	BarlashtiDaud shah Bannu
15	66-70	06	0	Both	Sero khas Bada khel& Ismail khel Bannu
16	71-75	0	0	Both	
17	76-80	01	0	Both	Pai khel Mandan Bannu

SN.	Age ranks	Number of Tested sera	Number of Positive Sera	Sex	Area
1	2 month	7	0	both	LalisherMandew&Kotka Mir AlamDaud Shah Bannu
2	3 month	1	0	both	Sero khas Bada khel& Ismail khel Bannu
3	4 month	5	0	both	Pai khel Mandan &BarlashtiDaud shah Bannu
4	5 month	2	0	both	Jhangi khan Daud shah &Nurar Bannu
5	6 month	5	0	both	Mastikhel, Gala khelDaud shah &KotkaEidekChayGhariMameshkhel Bannu
6	7 month	3	0	both	MenakKhel MerhKhel Esaki &ImaroMandan Bannu
7	8 month	2	0	both	Pai khel Mandan & Zafar khelDaud shah Bannu
8	9 month	3	0	both	Zakir khelSurani& Gala khelDaud shah Bannu
9	10 month	3	0	both	Kotka Noor Baz Daud shah Bannu
10	11 month	4	0	both	Kotka Shiekhan Mandan & Tarha wola Ghorl wola Bannu
11	1 year	7	0	both	Pai khel Mandan, Lalisher, Shamadikula& Zafar khelDaud Shah Bannu
12	2 year	2	0	both	Menak Khel Merhkhel Bannu
13	3year	7	0	both	Masti khel Daud shah, Bharat khas, Hujari Piran & Jhogi kula Mandan Bannu
14	4year	6	0	both	Sero khas, Jhangi khan Daud shah, Gara Baber & Sarwar Fateh Khel Bannu

DISCUSSION

Toxoplasmosis is a zoonotic infection, caused by the *Toxoplasma gondii*. It is concerned with high morbidity and mortality in all warm-blooded animals including human beings. In the present study, a total of 150 domestic animals including 100 chickens,50 cranes were diagnosed for *T. gondii* infection.

Among these, a single positive case was recorded. A study was conducted in the Bannu Region of KP Pakistan, the overall prevalence of *Toxoplasma gondii* antibodies was recorded in birds was not recorded. The caged chickens were less infected with toxoplasma rather than free-range chickens [11]. Similarly, [12, 13] reported that free-range birds and chickens were more disposed to the *Toxoplasma* infection rather than caged birds. Because free-range birds and chickens closely came in contact with ground soil. The free-range birds and chickens are the best indicator of environmental contamination by oocysts [14, 15] reported that birds are the most important hosts of *T. gondii* and this infection is transmitted easily to others. Usually, the infection is transferred to ground-foraging birds when come in contact with soil containing oocysts. Cats have frequently transferred this infection. Previous results indicate that *T. gondii* infection produces high mortalities in different wild birds. A study was conducted by [16] in rural areas of Faisalabad Punjab, Pakistan, A total of 36.33% prevalence was recorded in chickens. On the basis of age-wise, 1.5-2 years have a high prevalence (57.14%) of toxoplasmosis. Similarly, chickens who are kept near along with cats have a higher prevalence of 95% as compared to those without cats 53.89% respectively. A study was conducted by (17) in a neighboring country like China, a total of 200 horses were screened, of which (31.4%) were seropositive for *T. gondii*.

CONCLUSION

From the previous and current study, we strongly condemn that the RDK kit was used in this study was human-based diagnostic tools used for the investigation of IgG and IgM antibodies against toxoplasmosis infection. The previous research tools used were advanced and DNA based investigation. Where antigen was clearly exposed in the form of ELISA kit. We strongly recommend DNA based investigation that the gene responsible for antigen must utilize for seroprevalence research purposes. Also, we recommend molecular base diagnostic specially polymerase chain reaction.

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