Prevalence of *Toxoplasma gondii* infection in domestic animals in District Bannu Khyber Pakhtunkhwa (KP), Pakistan

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**Key words:** *Toxoplasma gondii*, Domestic animals, District Bannu

**Abstract**

*Toxoplasma gondii* is an intracellular zoonotic protozoan parasite, infect both humans and animals population worldwide. It can also cause abortion and inborn disease in humans and livestock population. In the present study total of 313 domestic animals were screened for *Toxoplasma gondii* infection. Of which 45 cows, 55 buffalos, 68 goats, 60 sheep and 85 shaver chicken were tested. Among these 40 (88.88%) cows were negative and 05 (11.12%) were positive. Similarly 55 (92.72%) buffalos were negative and 04 (07.28%) were positive. In goats 68 (98.52%) were negative and 01 (01.48%) was recorded positive. In sheep and shaver chicken the infection were not recorded.

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**Introduction**

*Toxoplasma gondii* is an intracellular zoonotic protozoan parasite, infect both humans and animals population worldwide. This infection is transferred by using raw meat and deeply contact with cat fical materials containing oocytes. It can also cause abortion and inborn disease in humans and livestock population (Krick and Remington, 1978; Dubey and Beattie, 1988).

*Toxoplasma gondii* is approximately 25% of the population is transport this parasite worldwide (Petersen, 2007; Ahmad et al., 2013). It is most common infection, because 6 billion peoples of the world have been suffered from this infection (Furtado et al., 2011). Other survey indicates that one third of the humans’ population is recorded to transfer the toxoplasmosis worldwide (Ryan and Ray 2004). It has been also recorded that warm and humid regions have high value of prevalence of toxoplasmosis (Coelho et al., 2003).

*Toxoplasma gondii* has deeply adverse effects on livestock production (Dubey and Jones, 2008). For example it infect the birds and other domestic animals and produce many serious symptoms like neck twisting and weight loss (Dolores and Dubey, 2014). The cysts of *Toxoplasma gondii* has been documented in various infected cattle tissue like ribs muscles, brain, liver, tongue and heart (Dubey and Thullies, 1993; Sanger et al., 1953).

Toxoplasmosis is causes abortion, neonatal deaths and still births in small ruminants. Similarly sub-clinical infection may also causes in adult animals (Buxton, 1990; Hassig et al., 2003). Epidemiological studies of toxoplasmosis have been conducted in different countries owing to its significance in livestock sector (Figliuolo et al., 2004).

In Pakistan, goats and sheep breeding is a vital source of meat and milk production. Besides from commercial husbandry practices, these animals are also kept by the poor farmers at their homes because of their reduce price maintenance and short term return. Studies carried out in southern parts of the country have diagnosed the prevalence of  *Toxoplasma gondii* in sheep and goats (Ramzan et al., 2009; Lashari and Tasawar, 2010; Tasawar et al., 2011).

Any other reports of *Toxoplasma gondii* infection has not documented in small ruminants from the southern KPK (district Bannu), which has unique climatic and geographic conditions as compared to the other regions of the country. Therefore, keeping in view the significance of the infection, a survey was carried out the prevalence of *Toxoplasma gondii* infection in domestic animals in District Bannu Khyber Pakhtunkhwa (KP), Pakistan.

**Materials and methods**

The present survey was carried out in district Bannu region KP, Pakistan. It is located in between the 31.28º North latitude and 73.25º East longitudes. It occupies total area of 1,227 square kilometers, and total human population is 677350 with annual growth rate is 2.8% respectively. The climatic condition is 48ºC in summer and 6ºC in winter season. 45% area is irrigated through canal systems and the remaining area is depend upon the rain fall.

The domestic animals were randomly selected and collected 5 ml blood from their jugular vein. The collected blood were immediately transported to the civil veterinary hospital district Bannu. The serum was removed by centrifugation at the speed of 3500 rpm for five minutes. For the detection of *toxoplasma gondii* antibodies IgG and IgM, commercial ELISA Kits were used according to manufacturing protocols.

**Results**

In the present study total of 313 domestic animals were screened for *Toxoplasma gondii* infection. Of which 45 cows, 55 buffalos, 68 goats, 60 sheep and 85 shaver chicken were tested. Among these 40 (88.88%) cows were negative and 05 (11.12%) were positive. Similarly 55 (92.72%) buffalos were negative and 04 (07.28%) were positive. In goats 68 (98.52%) were negative and 01 (01.48%) was recorded positive. In sheep and shaver chicken the infection were not recorded (Table 1).

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Table 1. Prevalence of *Toxoplasma gondii* infection in domestic animals.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Animals</th>
<th>No. Screened</th>
<th>No. Negative</th>
<th>No. Positive</th>
<th>% Negative</th>
<th>% Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cows</td>
<td>45</td>
<td>40</td>
<td>05</td>
<td>88.88</td>
<td>11.12</td>
</tr>
<tr>
<td>2</td>
<td>Buffalos</td>
<td>55</td>
<td>51</td>
<td>04</td>
<td>92.72</td>
<td>07.28</td>
</tr>
<tr>
<td>3</td>
<td>Goats</td>
<td>68</td>
<td>67</td>
<td>01</td>
<td>98.52</td>
<td>01.48</td>
</tr>
<tr>
<td>4</td>
<td>Sheep</td>
<td>60</td>
<td>60</td>
<td>00</td>
<td>100</td>
<td>00.00</td>
</tr>
<tr>
<td>5</td>
<td>Shaver Chicken</td>
<td>85</td>
<td>85</td>
<td>00</td>
<td>100</td>
<td>00.00</td>
</tr>
</tbody>
</table>

**Discussion**

Toxoplasmosis is a zoonotic parasite, caused by the *Toxoplasma gondii*. It is deeply concerned with high morbidity and mortality in all warm-blooded organisms including human beings. In the present study total of 313 domestic animals including 45 cows, 55 buffalos, 68 goats, 60 sheep and 85 shaver chicken were screened for *Toxoplasma gondii* infection. Among these 40 (88.88%) cows were negative and 05 (11.12%) were positive. Similarly 55 (92.72%) buffalos were negative and 04 (07.28%) were positive. In goats 68 (98.52%) were negative and 01 (01.48%) was recorded positive. In sheep and shaver chicken the infection were not recorded.

A study was conducted by Ahmad et al., 2015 in Pothwar Region of Punjab Pakistan, the overall prevalence of *Toxoplasma gondii* antibodies was recorded in sheep and goats with percentile range of 18.16% (75/413) and 14.32% (60/419) respectively. But the IgG antibodies prevalence was 15.49% (64/413) and 11.93% (50/419) in sheep and goats, while IgM antibodies prevalence was 3.39% (14/413) and 2.86% (12/419) in sheep and goats respectively.

Another study was conducted by Mahmood et al., 2014 in district Mardan KP, Pakistan, therefor the prevalence of toxoplasmosis was recorded 5.90% and 20.70% in caged and free range chickens. The caged chickens were less infected with toxoplasma rather than free range chickens. Similarly Dubey, 2010; Shah et al., 2013 reported that free range birds and chickens were more susceptible to the *Toxoplasma* infection rather than caged birds. Because free-range birds and chickens were closely come in contact with ground soil. The free-range birds and chickens are the best indicator of environmental contamination by oocysts. Murao et al., 2008; Wu et al., 2011 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 are frequently transferred this infection. Previous results indicate that *T. gondii* infection produce high mortalities in different wild birds. A study was conducted by Akhtar et al., 2014 in rural areas of Faisalabad Punjab, Pakistan, A total of 36.33% prevalence was recorded in chicken. On the basis of age wise, 1.5-2 years have high prevalence (57.14%) of toxoplasmosis. Similarly chickens who’s kept near along with cats kept along with pet cats have higher prevalence 95% as compared to those without cats 53.89% respectively. A study was conducted by Wang et al., 2015 in neighboring country like China, total of 200 horses were screened, of which (31.4%) were seropositive for *T. gondii*.

The results showed that horses were more susceptible to the *T. gondii* in Xinjiang, northwestern China, indicating a severe threat to the human health and animals. Another studies were conducted by Ramzan et al., 2009; Lashari and Tasawar, 2010; Tasawar et al., 2011 reported *T. gondii* infection in sheep from southern parts of the country. Similarly in neighboring countries like Iran, India and China (Ghorbani, 1983; Sharma et al., 2008; Zhao et al., 2011 were also reported. Another studies were conducted by Maronpot and Botros, 1972; Hove et al., 2005; Klun et al., 2006; Romanelli et al., 2007; Samra et al., 2007; Sanad and Al-Ghabban, 2007 reported *T. gondii* infection in sheep from Egypt, Zimbabwe, Serbia, Brazil, South Africa and Saudi Arabia. But on the other hand goats were more susceptible to the *T. gondii* infection in Uganda, Thailand, Saudi Arabia, and Egypt Bisson et al., 2000; Jittalpalpong et al., 2005; Sanad and Al-Ghabban, 2007; Barakat et al., 2009.
In short the present findings were less as compare to the mentioned results because of good farm managements, hygienic and climatic conditions in district Bannu KP Pakistan. Zhao et al., 2011 reported that T. gondii infection in animals were different in different regions of the world is due to the different farm managements, hygienic and climatic conditions. Vesco et al., 2007 also reported that seroprevalence of toxoplasmosis among animals is differs because of different serodiagnostic tests used.

Conclusion
Toxoplasma gondii is an intracellular zoonotic protozoan parasite, infect both humans and animals population worldwide. It can also cause abortion and inborn disease in humans and livestock population. The present study was concluded that 45 cows, 55 buffalos, 68 goats, 60 sheep and 85 shaver chicken were tested for Toxoplasma gondii infection. Among these 40 (88.88%) cows were negative and 05 (11.12%) were positive. Similarly 55 (92.72%) buffalos were negative and 04 (07.28%) were positive. In goats 68 (98.52%) were negative and 01 (01.48%) was recorded positive. In sheep and shaver chicken the infection were not recorded.

References


