Explor Anim Med Res,
Vol.7, Issue - 2, 2017, p. 210-212

Short Communication

INVESTIGATION OF TOXOPLASMA INFECTIONS IN NATIVE POULTRY OF TABRIZ CITY USING ELISA AND INDIRECT IMMUNOFLUORESCENCE METHODS

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Received 12 February 2017, revised 11 November 2017

ABSTRACT:*Toxoplasma gondii* is widely distributed in humans and other animals and birds throughout the world. Toxoplasmosis is a common zoonotic infection in the world and in immune-deficient patients, it may cause acute and lethal infection. The aim of current study was to investigate the prevalence of antibodies against *Toxoplasma gondii* IgG by ELISA and indirect immune fluorescence in backyard fowls in Tabriz city. Blood samples were evaluated to detect anti - *Toxoplasma gondii* IgG in backyard fowls. The prevalence of Antibody against *Toxoplasma* IgG in native poultry of Tabriz was detected 18%in ELISA and 30% in indirect immune-fluorescence (IFA) method. Results of indirect IFA method indicated, 14% of roosters and 16% of hens were infected. Because of high rate of infection with *Toxoplasma gondii* in rural poultry, monitoring program along with anti-parasite treatment should be implemented.

Key words: *Toxoplasma gondii*, Native poultry, Indirect immunofluorescence, ELISA.

Toxoplasma is a zoonotic disease that its final host is cat and its intermediate hosts are humans and other mammals. This disease does not cause important problems in cats, but in intermediate hosts such as humans, especially pregnant women and people with immune deficiency creates many problems (Tenter *et al.* 2000). *Toxoplasma gondii* is an obligate intracellular parasite that has a global distribution. Epidemiological investigations confirm that not only the *Toxoplasma gondii* released through raw meat consumption, but also the disease in some societies is associated with habit of feeding raw meat. Fresh animal droppings and secretions with proven infections were not involved in experimental transmission to rats in terms of *Toxoplasma gondii* (Zoghi 1999).

As Toxoplasma has worldwide spread, the existence and distribution of the disease in various parts of the Iran has been specified. The existence of *Toxoplasma gondii* in Iran was firstly reported by Ansari *et al.* in 1948. Sofar, several reports have been provided on the prevalence rate of toxoplasma antibody in human communities in Iran.

The main or final and intermediate hosts are seen in the parasite life cycle. The final host belongs to family of cats and wild cats and Lynx, including domestic cats, and leopards and lions and wildcat. Intermediate hosts include mammals, birds and other warm-blooded animals, cows, humans, sheep, goats, pigs, horses, dogs, wild and domestic rabbits, guinea pigs, rats and possibly reptiles (Signorell *et al.* 2006, Tenter *et al.* 2000, Dubey and Jones 2008).

Although the disease normally found in chickens, some researchers believe that chicken is somewhat resistant against Toxoplasma. Signs of disease in chickens have been reported as weight loss, neurological complications, and injuries related to necrosis in the lungs, heart, liver, brain, gastric ulcers, eye, and optic nerve chiasm (Dubey 2010, Biancifiori *et al.* 1986, Kaneto *et al.* 1997).

The aim of study was to evaluate the rate of infection with toxoplasma parasites in native poultries of Tabriz and countryside based on serological tests, for this purpose two methods of Toxo - IgG ELISA, Toxo - IFA were used.

Laboratory study

The study was performed in Tabriz city of Iran during 2015. In the study, 100 blood samples were obtained from a native poultry aseptically. Blood was gainedfrom the wing vein. Then, the serum was extracted and frozen and at -20°C.

Indirect IFAT method: In this test, killed trophozoite fixed on glass slide, and incubated with different serum dilutions. Fifty (50) collected serum was tested by that method. Antibody was determined by anti-gamma

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Table 1. Distribution of frequency of Toxoplasma in rural poultries of Tabriz and suburbs in terms of IgG.

Name of the test	Sample size	Positive	Positive in Hen	Positive in Rooster
ELISA	100	18(18%)	11(11%)	7 (7%)
IFAT	50	15 (30%)	8 (16%)	7 (14%)

globulin anti-serum, which binds to the Fluorescein. The titre In most of laboratories, titres (IFAT) equal or higher than 1/6 indicate infection and titres higher than1/1000 increase the likelihood of acute infection (Liesenfeld *et al.* 2001).

ELISA method: One hundred (100) serum samples were tested by that method**.** ELISA was performed by manufacturer instruction. Anti- *Toxoplasma gondii* IgG-ELISA kit (Pishtaz Teb Company) was used. for ELISA test. SPSS statistical software was used to data analysis and the data was analyzed by frequency, and chi-square tests.

Result of the study

Investigating the distribution of frequency of Toxoplasma by ELISA method on native poultries of Tabriz city and suburbs showed that out of 100 samples, 18 samples of chicken serums (18%) were higher than normal of the total number of IgG anti-Toxoplasma titers (Table 1). In IFAT method, 8 hens (16%) and 7 roosters (14%) included totally 30% samples were found positive. The rate was 18% when tested by ELISA. This higher rate of IFAT technique may be due to false positive reaction (Ghorbani *et al.* 1978).

Chickens are an important role in the life cycle of *Toxoplasma gondii*, because in spite of *Toxoplasma gondii* infection, they do not show clinical symptoms. Chickens and hens are one epidemiological hosts for *Toxoplasma gondii* and the major source of infection for the cats that excrete resistant oocyst and humans who are infected by eating undercooked meat of hens infected with the disease (Dubey *et al.* 2002). The meat of chicken and hens can be a source of *Toxoplasma gondii* for humans, while the infection for the ovary and oviduct is possible and they are important from this point of view (Dubey *et al.* 2002). In one study, *Toxoplasma gondii* was isolated from 18.6% of infected chicken breast meats (Dubey *et al.* 2005). In a study conducted in serum of 150 chickens by corrected agglutination in terms of Toxoplasma, the prevalence of antibodies against Toxoplasma was about 18.7%. This prevalence rate was 30 percent in industrial chickens and 1.1% in broilers (Deyab and Hassanein 2005).

In a study, *Toxoplasma gondii* was isolated from 18.6% of infected hen breast meats (Dubey *et al.* 2005), which result of this study is in line with results of our study (18%).It was indicated there was higher rate of *Toxoplasma gondii* infection in rural poultry of Tabriz state. Monitoring of rural poultry in case of *Toxoplasma gondii* by various method and anti-parasite drugs administration for prevention and treatment is essential.

ACKNOWLEDGMENT

We Thanks for cooperation of parasitology laboratory of Veterinary Medical faculty in Islamic Azad university of Tabriz, Iran.

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***Cite this article as:** Fathollahzadeh M, Garedaghi Y (2017) Investigation of Toxoplasma infections in native poultry of Tabriz city using ELISA and indirect Immunofluorescence methods. Explor Anim Med Res 7(2): 210-212.