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Letter to the Editor

Toxoplasma and Blood Transfusion

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Dear Editor-in-Chief

In Iranian Journal of Parasitology Vol. 9, No. 1, Jan -Mar 2014, a paper entitled " *Anti-Toxoplasma gondii Antibody Levels in Blood Supply of Shiraz Blood Transfusion Institute, Iran* " by Shaddel et al. was published and prevalence of toxoplasmosis was reported as 23.6% in blood products. In this regard, following notes should be considered.

Blood transfusion is an important lifesaving medical intervention throughout health care systems. Sufficient and safe blood supply is ongoing challenges for Blood Transfusion Organizations. In Iran, national blood supply has been established on 100% voluntary blood donation, blood donor selection, according to the standards of the Iranian Blood Transfusion Organization (IBTO), which are implemented based on donors and or recipients safety measures. Laboratory screening for known transfusion transmitted infections, including HBV, HCV, HIV, syphilis and HTLV1-2 (In certain geographic areas) are carried out entirely. By which, prevalence of above mentioned agents decline dramatically. However it is not possible to achieve zero risk of transfusion transmitted infections, neither in Iran nor in any other part of the world yet.

Seroprevalence rates for *Toxoplasma gondii* in the general population vary worldwide and increased by age. Approximately 25% to 30% of the world populations are infected and more than 80% of primary infections are subclinical. The higher prevalence is observed in tropical areas (1). Seroprevalence rates in Iran estimated in range from 18% to 70% (2).

Toxoplasma is an obligate intracellular parasite, which can infect human by different modes mostly by ingestion and inhalation of contaminated products. Occasionally *T. gondii* could be transmitted from person to person by modes of mother-to-child transmission, organ transplantation and or rarely by blood transfusion. In context of transmission by blood transfusion, although the risk is theoretically possible but there are rare reports in the literature (3), so that there is no recommendation to screen the blood products for *T. gondii* in WHO, American Association of Blood Banks (AABB), European Council and so on.

In suspected cases of toxoplasmosis two categories of laboratory diagnostic methods are used: Direct (histological procedures, cell culture, PCR) and indirect (IFAT, EIA), it should be considered in mind that direct methods are highly specific. However, typically, laboratory diagnosis of toxoplasmosis is made by serological methods. Due to the high percentage of antibody-positive individual in the community, interpretation of serological tests are complex, only seroconversion could be interpreted suggestive of recent infection, on the other hand by appositive serology the confirmatory tests might be needed by opinion of physician. The authors assumed that positive IgM anti toxoplasmosis ELISA is equal to acute infection, but we should consider in mind that IgM begin to rise in acute infection and then decreased at convalescent phase by a very variable manner, which might be elongated to months and even more. For example, IgM antibodies have been reported to persist as long as 12 years after acute infection Thus, an acute infection is difficult to diagnose, even after that IgM positivity was confirmed by a *Toxoplasma* reference laboratory three possibilities may be considered: a recent infection, infected with *Toxoplasma* in the past, and a false positive result (4, 5), the false positive test result also might be seen in some clinical situation such as presence of Rheumatoid factor (RF) and/or Non Specific Binding Antibodies, that sometimes need more investigation and confirmatory test like avidity, histopathology, PCR, and even tissue culture.

Along with anti-toxoplasmosis IgG that is present at convalescent phase and maintain lifelong, does not indicated acute infection or risk of parasitemia. Therefore, usually, presence of IgG antibody is not Suggestive of infectivity in donated blood. Therefore, such result should be interpreted by a clinician and by considering the clinical situation carefully.

Considering the above facts, in a blood donor with IgM and IgG positive sera it cannot definitively state that there is an acute infection in blood donor and need more investigation, so that these methods do not compile the efficiency to be considered as screening test.

Even more in this study, the sampling method is obscure. Based on what is mentioned in the methods section, serum samples have been prepared directly from 138 units of packed red cell and 112 units of fresh frozen plasma. In other words, we can say that 250 units of the product are removed from the normal cycle of production and consumption. Therefore, an important question thus arises; whether investigators have permission to perform this intervention. By the way, either any testing on donors' blood sample, routine classic or research investigations needs to get permission of donor, and IBTO Ethic Committee consider this permission for ethical evaluation of each research, evidence for such permission did not indicate.

Considering the parasitological, clinical and laboratory characteristics, elimination of this scant residual risk by donor exclusion or laboratory screening is not possible.

Acknowledgements

The authors declare that there is no conflict of interests.

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