Serological and Hematological Study of Toxoplasmosis in Blood of Newly Born Babies

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ABSTRACT

Serological identification and blood pictures were done for specific IgM and IgG. 10% of cases were positive IgM of Toxoplasmosis because have 10 IU/ml (mean) in comparison with control group were 0.11 IU/ml (mean). On other hand 20% of diagnosed cases were positive IgG of Toxoplasmosis because have 11 IU/ml. Two cases were followed for their history one from group IgM and other IgG, first one suffered from three abortion and now have five child three of them healthy while two have congenital defects. Second case (IgG positive) have four abortion and now have three child, two healthy and one have congenital defect. Blood picture reveal 40% suffered from Normocytic anemia, these cases classified to three groups, first Toxoplasma group 30% (positive in ELISA test). Second group (Unknown causes), these cases not only normocytic anemia also have high total leukocytes 17×10 (mean) and high MCV (103 ft). Third group have low MCV 78ft.

Keywords: Toxoplasmosis, Neonatal Infection, *Toxoplasma Gondii*.

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INTRODUCTION

Congenital Toxoplasmosis occur when *Toxoplasma gondii* crosses the placenta barrier from the mothers blood. Most neonatal infection are asymptomatic but some causes death or disability to newborns (Duby, J. 1995, Jones J, Lopez A, Wilson M. 2003 & Remington, J. et al., 2010).

Guerina, N. et al (1994) published data on neonatal serologic screening and early treatment for congenital toxoplasmosis in new England region. In Norway Jenum, P (1998). Studied the incidence of *Toxoplasma gondii* infection in 35, 940 pregnant women and pregnancy outcome for infected women.

T. gondii can cause a congenital infection when women are infected during pregnancy or less commonly when women are infected during pregnancy or less commonly when

chronic infection become disseminated due to immune compromising or reinfections (Gavinet M. F. et al., 1997).

If congenital toxoplasmosis is not treated severe or fatal sequelae can occur. Fetal transmission rate depend on three concomitant factors: maternal parasitemia, gestational age at infection and maternal immune response to *T. gondii* (Jones J L. et al., 2001). Nimri, L. et al (2004). Published a modified research work on detection of *T. gondii* DNA and specific antibodies in high risk pregnant women. The most frequently observed clinical signs of congenital Toxoplasmosis are premature birth, low birth weight, retinocoroiditis, squint, jaundice, cerebral calcification, hydrocephalus and hepatosplenomegaly (Paquet C. and Yudin M. H. 2013). Figueiro-Filho, E.A. and Lopes

,A.H. (2005). Studied pregnant women serologically and found 7. gondii IgG occurrence ranging from 31% to 91% in two different states in Brazil. The risks of fatal infection are directly associated with disease prevalence in the population and with number of women in fertile age not infected and susceptible to infection during pregnancy, thus the importance of preventive actions should be emphasized as well as the early diagnosis and treatment to prevent or attenuate fetal infection (Foulon W.1992, Gavinet M F et al., 1997 & Matrin, F.2000).

Moura F L et al (2007) worked a survey of pregnant and postpartum women in the same population in Niteroi, showed that a significant number (41.5%) of susceptible women can acquire T. gondii during pregnancy, these susceptible patients are at risk of transmitting the parasite to their offspring through vertical transmission. The present study, was done randomly by testing blood samples were taken from umbilical cord of newly born babies, serologically for identification of T. gondii infection and hematological changes.

MATERIALS AND METHODS

Hundred pregnant women attended to the maternity and children hospital of Hilla on January 2017, Blood sample were collected from umbilical cord of newly born babies, these samples were hundred divided in two tubes, one with anticoagulant for study blood pictures, while other tube without anticoagulant for isolation serum to identify Toxoplasmosis by direct method of ELISA, the assays for toxoplasma IgM and IgG, briefly a 6mm, and specimen was tested by an IgM specific enzyme linked immunosorbent assay with a reported sensitivity, therefore control group rang 0.1-0.9 IU/ml (negative), While over 5 IU/ml (positive) for toxoplasmosis, in between these (suspicion), (Schmidt, S. et al., 2012).

Blood pictures were done in hematology laboratory of hospital by using blood analyzer. The results of these tests included complete blood picture of each sample.

Serological test confirmed the presence of toxoplasma IgM or IgG and accompanied

with history of mother must be treated immediately.

RESULT

Results of blood analysis for umbilical cord blood divided to three groups depend on picture. Normocytic (1) group, Normocytic (2) group, Toxoplasmosis group.

Toxoplasmosis: These group of cases where identified serologically direct method of ELISA, 10% of cases where positive to ELISA test for T. gondii because have 10 IU/ml (mean) of IgM, in comparison with control were 0.11 IU/ml, therefore these cases consider acute cases.

On other hand 20% of diagnosed cases were positive for toxoplasmosis because IgG which is specific for T. gondii was 11 IU/ml (mean), therefore these cases are chronic cases. The most prominent result of blood picture of Toxoplasmosis cases showed increase in total number of leukocytes 15.2-24.1 $\times 1000$ (rang) table (1) Fig. 1.

Two cases of toxoplasmosis were followed for their history, case number (2) who have IgM 10 IU/ml, history of these was suffered from three abortion in previous time and now have five children, three of them were healthy while other two have congenital defects. Case number (4) has IgG 11 IU/ml suffered from four abortions and now has three children, two healthy and one have congenital defect.

Normocytic 1:

Blood analysis revealed this group of cases was suffer from normocytic anemia with unknown cases with increase in total number of leukocytes 14.5-21.9 $\times 1000$ (mean) Table (1) Fig 1.

Table (1) Fig 3 demonstrated the mean corpuscular volume (MCV) increased 101 - 107 fl (rang), 103 fL mean while the control 81-96 fL. These cases also showed increased in (MCHC) mean corpuscular hemoglobin concentration, the range was 34.1-37.6 with a mean 35.9 in comparison with control 31.8 - 35.4, Fig. (2). As well as hemoglobin quantity was in between 14.1- 21.9 gm with a mean

17.1 gm in comparison with control 12.5 -16 gm Table (1).

Normocytic 2:

These group were have normal total number of leukocytes count 7.1 11.3x1000 with a mean 8x1000, but MCV decreased than

normal 72-81 fL , 78 mean while control 81-96 fL. MCVC was slightly increased with range 34.4- 37.6 mean 36.1, while control 31.8-35.4 . Hemoglobin result was with in the normal range, Fig (3).

Table (1) Represent the most prominent changes in blood picture

Group of Causes	WBC X10 ³			MCV FIL			MCHC			HB		
	Ran g	Mea n	Con.	Ran g	Mea n	Con.	Ran g	Mea n	Con.	Ran g	Mea n	Con.
Positive Toxoplasmosis	15.2-24.1	20.2	4-11	96.4-104	100.9	81-96	33.9-36.4	35.5	31.8-35.4	14-18.7	15.8	12.5-16
Group 1	14.5-21.9	17.2	4-11	101-107	103	81-96	34.1-37.6	35.9	31.8-35.4	41.1-21.9	17.1	12.5-16
Group 2	7.1-11.3	9.2	4-11	72-81	78	81-96	34.4-37.6	36.1	31.8-35.4	11.8-13.5	12.7	12.5-16

IgM IgG Normocyte healthy
Fig (1): show the results of blood analysis and ELISA.

Fig (3) Comparison among the results of mean corpuscular volume (MCV) for three groups.

DISCUSSION

Many researchers work on toxoplasmosis and especially on congenital toxoplasmosis

but from different aspects . Murwa, J. (2010) worked on toxoplasmosis serologically , 30% worked on toxoplasmosis serologically , 30% of IgG were positive by ELISA test , these results similar of these research but not IgM not recorded in comparison with present 10%, this variation depend several factors such as hosts, intermediate and final hosts and its distribution , susceptibility of women , or ingestion of undercooked meat (conimon in IRAQ) during pregnancy , as well as contact with cats or its fecal materials in gardens.

This research proved IgM production and this mean acute infection is present because it is produced during fitst month of infection .As well as several abortions from the same mother this represent reinfection and chronic disease can be reactivated to acute stage.

Two cases were chosen randomly one from IgM group and second from IgG group , first case have child with congenital toxoplasmosis (chorioretinitis) while second case have one child with congenital toxoplasmosis (mental retardation and chorioretinitis). These results nearly similar to the results presented by Nicholas G. G. et al (1994) tested 50 women 19 who positive for IgM and IgG 38% (present work 40%, 30% IgG ,10% IgM(.

Normocytic anemia, it is accompanied with chronic disease (Robbins et al.,2008), therefore some cases of toxoplasmosis (chronic cases) have normocytic anemia ,while other cases (not Toxoplasma but unknown causes) may be have chronic diseases as kidney diseases, cancer, rheumatoid arthritis , thyroiditis.

CONCLUSION

1- Toxoplasmosis is endemic disease in Hilla.

2- Percent of women have positive reaction for IgG of Toxoplasmosis was 30%, chronic stage of disease.

3- Percent of women have positive reaction for IgM of Toxoplasmosis was 10%, acute stage of disease.

4- 30 % of cases of toxoplasmosis were suffered from Normocytic

anemia.

5- 30 % of women have Normocytic anemia but without Toxoplasmosis (unknown) causes.

6- 10 % of women were normal healthy depend on blood picture.

RECOMMENDATIONS:

Congenital Toxoplasmosis serious problem, therefore prevention and control needed as soon as possible as follows:

1- Primary prevention is characterized by educational programs and public health to avoid infection because two cases were followed randomly, these women were uneducated.

2- Secondary prevention consists of serological screening during prenatal care to detect and treat acute infections by T. gondii , thus reducing the squeal caused by congenital toxoplasmosis.

3- Tertiary prevention is focused on the newborn , in which newborns with subclinical congenital Toxoplasmosis are treated in order to prevent further complications, especially ocular and risk of reactivation.

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