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SEROPREVALENCE OF CYTOMEGALOVIRUS INFECTION AMONG SUDANESE WOMEN WITH RECURRENT PREGNANCY LOSS (RPL)

^{1,2,*}Bahaeldin K. Elamin and ³Mohammed Osman M. A. Omer

¹Department of Microbiology and Parasitology, College of Medicine, University of Bisha, Saudi Arabia

²Department of Microbiology, Faculty of Medical Laboratory Sciences, University of Khartoum, Sudan

³Scientific Office, K-BIOANA-EUROIMMUN Company, Khartoum, Sudan

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ABSTRACT

Background: Maternal cytomegalovirus (CMV) infection during pregnancy has critical outcomes. The basic data concerning CMV infections during pregnancy is important for health planners and care providers.

Methodology: A retrospective cross sectional hospital based study was conducted, 94 pregnant women with recurrent abortion were included in the study from Khartoum Teaching Hospital in the period from January 2012 to January 2013. The data were collected from the patient medical file. Enzyme Linked Immunosorbent Assay (ELISA) was used for detection of CMV antibodies (IgG and IgM) using commercial diagnostic kits for Quantitative analysis, the assay result interpreted as IU/ml

Results: Out of 94 participants tested for CMV antibodies, Mean age was 29.88 years, 3 (3.2 %) and 52 (55.3 %) of the study group had seropositive CMV IgM and IgG respectively. It was found that the age group of 20- 29 and 30- 39 has a significant correlation with frequency of abortion.

Conclusion: CMV prevalence was 55.3%. However, it is difficult to say whether the occurrence of high antibody titre preceded or followed the abortions. Routine screening for CMV should be introduced for pregnant women in this setting.

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INTRODUCTION

Cytomegalovirus (CMV) is a herpes virus genus. This virus is ubiquitous virus infection with worldwide distribution and associated with opportunistic disease that has been recognized in more highly developed areas of the world. Acute disease of the infection occurs in only a small proportion of infected individuals, and it is restricted to settings where the ability to mount a cellular immune response is compromised, such as transplacental transmission during pregnancy leading to fetal damage and reactivation or primary infection of immunocompromised individuals (Knipe, 2007). The transmission of the virus by close non- sexual contact, sexual activities, utero placental transmission, breast feeding, blood transfusion and organ transplantation (Cannon and Davis, 2005; Landolfo *et al.*, 2003; Munro *et al.*, 2005; Revello *et al.*, 2008).

CMV is found throughout all geographic locations and socio-economic groups, but is more widespread in developing countries and in communities with lower socioeconomic status (Landolfo *et al.*, 2003) (Kim, 2010). Global prevalence of CMV infection is reported approximately 40%-80%, but it has been estimated to vary from about 45% in developed countries and to 100% in developing countries (Cannon and Davis, 2005; Landolfo *et al.*, 2003; Staras *et al.*, 2006). It has been reported that, Africa continent have one of the highest prevalence of CMV e.g. in neighboring Egypt, CMV Seroprevalence among pregnant women is 96 % (Cannon *et al.*, 2010; el-Nawawy *et al.*, 1996). In Western Sudan it has been reported that CMV prevalence is 72.2% among pregnant women (Hamdan *et al.*, 2011). Infection by CMV can cause pregnancy loss or spontaneous abortion which is defined as any natural abortion occurring at or before the 28th week of gestation with the fetus weighing less than 1000g. Recurrent pregnancy loss (RPL) is defined as two or more consecutive pregnancy losses with the same partner. Currently, RPL affects 2% - 4% of reproductive-age couples worldwide (Stephenson and Kutteh, 2007). In Sudan, to our knowledge, there is only one published data concerning CMV Seroprevalence in pregnant women in

*Corresponding author: ^{1,2}Bahaeldin K. Elamin

¹Department of Microbiology and Parasitology, College of Medicine, University of Bisha, Saudi Arabia

²Department of Microbiology, Faculty of Medical Laboratory Sciences, University of Khartoum, Sudan

Western Sudan. Considering the importance of intrauterine CMV infection transmission and complications and providing information to health planners and care providers, it seems necessary to investigate the prevalence of CMV infection during pregnancy especially in recurrent pregnancy loss (RPL). This study is aimed to determine the Seroprevalence of CMV infection among recurrent pregnancy loss (RPL) and correlate the finding with expected risks in Khartoum Teaching Hospital in period from January 2012 to January 2013.

MATERIALS AND METHODS

A retrospective cross sectional hospital based study was conducted, 94 pregnant women with recurrent abortion were included in the study from Khartoum teaching hospital in the period from January 2012 to January 2013. The data were collected from the patient medical file with help of the physician. Five mls of blood were collected in plain tubes, allowed to clot and centrifuged at room temperature. Then sera were capped and stored at -20°C till analysis. ELISA was used for CMV (IgG and IgM) using commercial diagnostic kits (DRG Instruments GmbH, Germany). Quantitative analysis for CMV (IgG and IgM) was performed, and the assay result interpreted as IU/ml. The manufacturer’s instructions was followed for the cutoff points, < 9 IU/ml was considered negative for CMV IgG and <50 IU/ml was considered negative for CMV IgM. The Hospital was informed for the purpose of the study, and the necessary ethics guidelines were followed. Permission to carry out the study was taken from the Scientific Research Committee, Khartoum University. Data analyzed using Statistical Packages for Social Sciences (SSPS) and cross tabulated for descriptive and analytical statistics by using the chi-square test. Data was analyzed using Statistical Packages for Social Sciences (SSPS). Detection of (P-value) was done by using the chi-square test using SPSS version 17.00 software.

RESULTS

Ninety four pregnant women with recurrent loss were included in this study; the age group varies from 17 years to 42 years with mean age (29.88) years (Table 1). The number of abortion was also varies between the participants (Table 2).

Table 1. Frequency of age group

Age group	Frequency (%)
less than 20 years	7 (7.4%)
20-29 years	37 (39.4%)
30-39 years	42 (44.7%)
More than 39 years	8 (8.5%)
Total	94 (100%)

Table 2. Frequency of abortion

Times of abortion	Frequency (%)
One time	30 (31.9%)
Two times	34 (36.2%)
Three times	29 (30.9%)
Four times	1 (1.1%)
Total	94 (100%)

Significant relationship between age group and frequency of abortion was observed (p<0.05) (Figure 1). Seropositivity of

CMV IgM was detected in three participants (3.2%), while seropositivity of CMV IgG was detected in 52 participants (55.3%). CMV seropositivity was also analyzed with respect to age group and times of abortion. No significant statistically difference was found between them (Figure 2, 3).

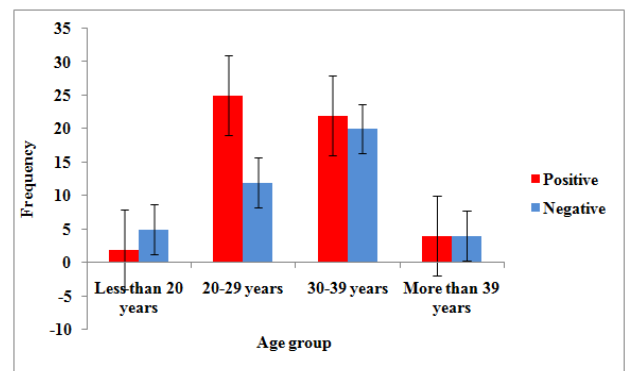


Figure 1. Frequency of abortion with respect to age groups

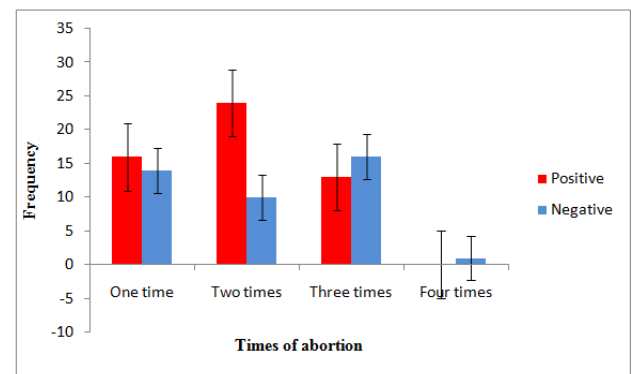


Figure 2. Frequency of CMV infection with respect to age groups

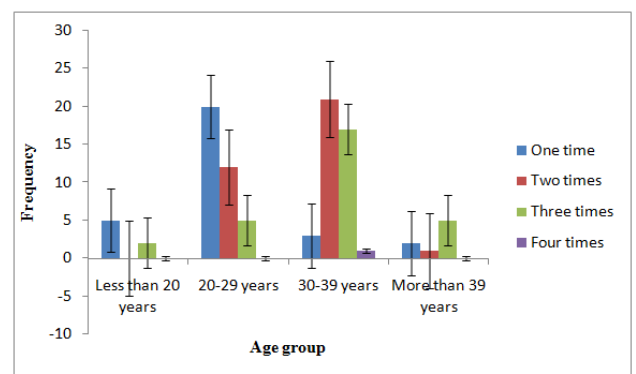


Figure 3. Frequency of CMV infection with respect to Times of abortion

DISCUSSION

CMV is one of TORCH agents group (Toxoplasma gondii, Rubella, Cytomegalovirus, Herpes simplex), which a worldwide obstetrical problem, where transplacental transmission of the infection may result in serious congenital diseases in the newborn child. Cytomegalovirus (CMV) is a universally distributed pathogen with approximately 40-100% of the world's population having CMV antibody present in

blood as evidence of infection, the highest prevalence being in countries in the developing world (Freeman, 2009) (Marshall and Koch, 2009). To our knowledge there is no published data concerning CMV infection among Recurrent Pregnancy Loss (RPL) in Sudan, but there is only one published paper in Western Sudan concerning epidemiology of CMV among pregnant women. In the current study, the prevalence of CMV IgG in Khartoum Teaching Hospital was 55.3% among recurrent abortion pregnant women which was lower than prevalence of CMV IgG among pregnancy reported in Western Sudan (72.2%). (10) Also it was lower than other African countries e.g.: 96% in Egypt, 97.2% in Benin and 87% in Gambia. (Bello and Whittle, 1991; el-Nawawy *et al.*, 1996; Rodier *et al.*, 1995). Our findings for CMV infection is close to those reported in study in United State of America (58.9 %) (Staras *et al.*, 2006).

Conclusion & Recommendation

This study showed the prevalence of CMV infection was 55.3% among recurrent pregnant loss women in Khartoum Teaching Hospital in Sudan. However, since this study was cross sectional, it is difficult to say whether the occurrence of high antibody titer preceded or followed the abortions. Routine screening for CMV should be introduced for pregnant women in this setting. Further research is needed.

Disclosure of conflict of interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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