

## **Seroprevalence of Cytomegalovirus among blood donors and antenatal women attending two hospitals in Khartoum State**

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### **Abstract**

**Back ground:** Cytomeglovirus(CMV) is a common viral infection globally. Although most infections are subclinical; infection during pregnancy may be associated with serious outcome such as abortion, stillbirth and congenitally malformed child.

**Methods and results:** During the period from June to July2003, 250 subjects (150 blood donors and 100 women presenting to Khartoum Teaching Hospital's and Omdurman Maternity Hospital respectively)had their blood tested for IgG antibodies against Cytomegalovirus using ELISA test. Of these 84% were found to harbor Cytomegalovirus antibodies. The seroprevalence of the virus was higher in the antenatal women (95%) compared to the blood donors (77%).

**Conclusion:** The study revealed insignificant association between infection with the virus and both history of previous surgical operation and blood transfusion ( $p > 0.05$ ).CMV infection was found to be associated with increased risk of abortion in women under study.

**Keywords:** herpesviruses, abortion, blood transfusion.

**C**ytomegalovirus (CMV) belongs to the subfamily  $\beta$  herpesvirinae of herpesviruses. It is endemic all over the world. The prevalence of the virus varies with socioeconomic conditions and hygienic practices. The rate of infection with the virus varies widely from 40 -80 % in high socioeconomic groups in developed countries to 90 – 100% among children and adults in developing counties respectively <sup>1,2</sup>.

Despite the high prevalence of the virus, the majority of infected individuals do not show clinical symptoms and signs; few may be associated with serious manifestation such as mononucleosis, abortion, stillbirth and congenital cytomegalic disease.

However reactivation of the virus in immunocompromised patients, particularly when the deficiency affect cell mediated immune response, like HIV- infected individuals and allograft recipients, may be associated with serious complication such as chorio-retinitis (leading to blindness) and colitis.

With the increasing number of HIV infection worldwide, and expectation of a high seroprevalence of CMV in the country reactivation of the virus with severe disease and serious complications is anticipated <sup>3</sup>. This study is conducted to throw light on the situation in Sudan regarding the infection rate.

### **Materials and methods:**

During the period from June – July, 2003 a total of 250 individuals were recruited to participate in this study. Of these 150 were blood donors selected randomly from individuals attending Khartoum Teaching Hospital to donate blood. The remaining 100 were women attending the antenatal clinics of Omdurman Maternity Hospital for antenatal

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care. After a verbal consent to participate in the study, data were collected from each subject by interviewed questionnaire. Thereafter 5mls of venous blood were drawn under aseptic technique. The blood samples were allowed to clot and after clot retraction centrifuged and the serum separated into cryogenic tubes. The separated sera were stored in a deep freezer at -20 C to be tested later.

All blood specimens were tested for presence of CMV IgG antibody by ELISA (Human Company).

**Results:**

The seroprevalence of CMV was found to be high in both the blood donors and women attending the antenatal clinics (77% and 95% respectively) table (1).

Table (1) prevalence of CMV IgG antibodies among the studied groups

Group	Total tested	No. with Ab.	% with Ab.
Blood donors	150	116	77
Antenatal women	100	95	95
Total	250	211	84

The study showed association between previous blood transfusion and surgical operation and infection with CMV (RR: 1.2 & 1.1 respectively) table (2). The results of the study also showed increased risk of abortion among CMV infected women (table 3).

Table (2): association between certain risk factors and CMV seropositivity

Risk factor	Number exposed to the risk			Not exposed to the risk			Relative risk
	Total tested	Number +ve	AR	Total tested	Number +ve	AR	
Previous transfusion	10	10	1	240	201	0.8	1.2
Previous surgical operation	55	52	0.9	195	159	0.8	1.1
Parenteral drug use	33	33	1	217	188	0.8	1.2

AR = Attack rate

RR = Relative risk

Table (3) Risks associated with CMV infection

CMV Ab status	Abortion		Congenital malformation	
	With abortion	With no abortion	With congenitally malformed child	With no congenitally malformed child
Total	34	66	1	99
CMV +ve	33(97%)	62(94%)	1(100%)	94(95%)
CMV -ve	1(3%)	5(6.1%)	0(0%)	5(5%)
RR	1.0		1.1	

RR = relative risk

**Discussion:**

The percentage of cytomegalovirus infection among blood donors in the current study is in agreement with reported figures from USA

(80%), but lower than that found in India (95%) and higher than the reported figures from Thailand (52%)<sup>3-5</sup>.

The rate of infection by CMV among women attending the antenatal clinics was found to be high (95%) but similar to the results of studies performed in Egypt and Brazil (96% and 98% respectively). Similar studies done in India, Japan and Belgrade revealed lower seroprevalences (87.4, 45% and 21.4%)<sup>6-10</sup>.

The high seroprevalence of CMV infection among the studied group may be due to poor socioeconomic conditions and hygienic practices known to play a role in the transmission of the virus. In the current study, previous blood transfusion and history of previous surgical operation were both associated with increased risk of CMV seropositivity (RR: 1.2 and 1.1 respectively). However this association was not statistically significant ( $p > 0.05$ ). Although the percentage of abortion was higher in patients who were positive for CMV antibodies, this was not statistically significant ( $p > 0.05$ ).

#### **Conclusion:**

The percentage of CMV infection is very high among the blood donors and women attending the antenatal clinics. Infection with the virus insignificantly increases the risk of abortion. Previous blood transfusion and surgical operation, both, increase the risk of infection with CMV; however, this is also not statistically significant.

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