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Microbiology

CO-INFECTION OF CYTOMEGALO VIRUS AMONG NAÏVE HIV POSITIVE PERSONS IN S.M.S. MEDICAL COLLEGE, JAIPUR, RAJASTHAN.

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ABSTRACT

Background: The primary cells attacked by HIV are the CD4+ lymphocytes, continuous destruction of CD4+lymphocytes, jeoparadize immune system when CD4 count reduced to <200 cells/ cmm, person becomes susceptible to opportunistic infections CMV is the predominant opportunistic viral infection among hiv positive persons . In present study we detect Cytomegalovirus IgM and IgG antibodies in serum of naive HIV positive persons and there co-relation with CD^4cell count.

Method: sample of 220 naïve HIV positive cases were collected over a period of one year.CD_4 T lymphocyte count and detection of IgM and IgG antibodies against cytomegalovirus by using chemilumenescence method was done for all samples

Summary : out of 220 cases studied all were positive for CMV IgG and 19 were positive for both IgM & IgG.s Early diagnosis of CMV Ig M antibodies and CD4 estimation will help in early detection of CMV virus before the development of clinical manifestations.

KEYWORDS : HIV, CMV, CD^4.

INTRODUCTION

Human immunodeficiency virus (HIV) infection poses tremendous challenges to health globally. India has the third highest number of estimated people living with HIV in the world.[1]

HIV or Human Immunodefeciency Virus is a RNA virus belongs to the lentivirus subgroup of the family Retroviridae. It plays a very significant role in weakening the immune system of its host. A damaged immune system permits the reactivation of CMV and during advanced AIDS; The primary cells attacked by HIV are the CD4+ lymphocytes, which are glycoprotein expressed on the surface of T_h cells, macrophages, monocytes, regulatory T cells and dendritic cells and play a vital role in performing important immune responses in the body, . With more active HIV infection or on prolonged exposure to HIV would deprive the host of its CD4 containing cells and this reduced CD4 count <200 cells/cmm] leading to reduced host immunity and the body becomes progressively more susceptible to opportunistic infections (OIs)[2]

CMV can produce debilitating end- organ disease (EOD) including retinitis, colitis and pneumonitis.[2] CMV is a large encapsulated double stranded DNA virus belonging to the beta-herpes virus group.[3]

HCMV is further classified into the Betaherpesvirinae subfamily, which indicates a restricted host range (non-exclusive to this subfamily), a long reproductive cycle, ability to establish a latent infection, haematogenous spread and possible site of latency, and that infected cell frequently become enlarged (cytomegalia).[4]

CMV infection is defined as isolation of CMV, or detection of CMV proteins or nucleic acid, in any body fluid or tissue specimen (e.g. plasma, serum, whole blood, peripheral blood, leucocytes, CSF, urine.)[5]

MATERIAL AND METHODS

Study Design & Study Population

The study was conducted from April 2016 to March 2017. This was a Hospital based observational descriptive study conducted in Department of Microbiology, SMS, and Medical College Jaipur. The Sample size was 220 patients, calculated at 95% confidence level, 80% power assuming 41.2% sero-prevalence of CMV INFECTION in HIV/AIDS patients and 5% allowable error. We included 220 HIV sero-positive ART naïve patients in study group. The patients were not aware about their HIV status at the time of presentation. HIV status of these patients was confirmed at Integrated Counseling & Testing Center (ICTC) by three different antibody tests as per NACO guidelines.[6] at enrollment, informed consent was obtained from patients and a Performa was filled which consisted of socio-demographic and personal details of patients. HIV Positive persons already on ART were excluded from study. Blood samples were collected from all the patients.

Separated serum samples were tested for the presence of IgM and IgG antibodies against cytomegalovirus using chemilumenescence method [by COBAS e 411 roche diagnostics] [7] and whole blood samples were tested for CD4+T lymphocytes count estimation by BD FACS caliber [BD biosciences].[8]

OBSERVATIONS AND RESULTS

Table 1: Age distribution of CMV seropositive cases

Age Group	IgM +IgG		IgG Only	
	Positive	Percentage%	Positive	Percentage%
<10	0	0	13	5.90
11-20	0	0	16	7.27
21-30	2	10.52	45	22.38
31-40	8	42.10	53	26.36
41-50	4	21.05	39	19.54
51-60	5	26.31	28	13.93
61-70	0	0	7	3.18
Total	19	100	201	100

Table 2: Serological distribution of CMV Antibodies according to mode of transmission of HIV

Risk Factor	IgM +IgG		IgG only	
	Positive	%	Positive	%
Blood Product (BLP)	1	5.26	05	2.48
Females Sex Worker (FSW)	16	84.21	110	54.72
Intravenous Drug Users (IDU)	0	0	17	8.45
Parent to Child Transmission (PTC)	0	0	19	9.45
Spouse	2	10.52	44	21.89
Unknown	0	0	06	2.98
Total	19	100	201	100

Table 3: Relation of CD4 cell count with CMV IgG and IgG IGM counts

Cd4 cell count (/cmm)	CMV IgM IgG		CMV IgG ONLY	
	Positive (N=19)	Percentage %	Positive (N=201)	Percentage %
<50	12	63.15	12	5.97
51 to 100	6	31.57	13	6.46
101 to200	1	5.26	53	26.37
201 to 350	0	0	52	25.86
351 to 500	0	0	34	16.91
> 500	0	0	36	17.91

DISCUSSION

In present study, sero-positivity of IgM+ IgG (both) antibodies among

HIV infected individuals is 8.63%. Our findings are consistent with that of *Ngangom Lilavati1e t* al [9] *Ali R.Orer, Sana M.H. Al izi, et al* [10] *Basawaraju Anuradha et al* [11]. *Musa AM, et al*[12], *Chakravarti et al. (2010); et al*[13] where they reported seropositivity in HIV infected patients as 14.8%, 9.5%, 8.6%, 9.7%, and 9.3% respectively. This maybe because in HIV infected individuals, IgM antibody are often not detectable due to profound immunosuppression.[2,15]

In present study, out of 201 positive cases of anti-CMV IgG antibody, 26.36% belonged to age group of 31-40 years and out of 19 anti-CMV IgM +IgGantibody cases 42.10% belong to age group 31-40 years. Our findings are comparable to studies by *Dr Ngangom Lilavati1e t al*[9]*and Musa AM, et al*[12]*Farhad makhani et al*[14] where 43.39% and 33.34%, 42.89%, individuals of 31-40 years of age were IgG +IgM seropositive respectively. This trend could be attributed to the fact that the above mentioned age groups represent sexually active and matured youths with the tendency towards sexual promiscuity and its resultant.[13]

In present study the most common route of transmission of HIV was sheterosexual contact in 54.72 % of patients for only IgG positive and 84.21% for both IgM IgG positive. Similar observations have been reported by another Indian study by *Nilanjan chakraborty et al*[2] and study conducted by *Farhad Mehrkhani1 et al*[4] in Iran.

In present study maximum numbers of anti CMV IgM+IgG (both) antibodies positive cases were in group with CD4+ T lymphocyte count < 50 cells/c mm followed by 51-100 cells/c mm and then101-200cells/cmm.. These patients would have a higher chance to develop CMV encephalitis than others who had CD4+ T lymphocyte count > 200 cells/c mm. In clinical practice, CD4+ T lymphocyte count is considered to be a prognostic or risk factor to monitor the progression of HIV infection.[5]

Our findings are similar to *Cunha et al. 2002* [14]*, Chakravarti et al.*[13]*, Musa AM, et al*[12]*, Nilanjan chakraborty et al*[2] but it is in contrast with *Ngangom Lilavati et al*[9] as their highest prevalence of anti-CMV IgG antibodies was in CD4+ T lymphocyte count 101-200cell/mm.

SUMMARY AND CONCLUSION

Cytomegalovirus is one of the opportunistic infections associated with significantly high morbidity and mortality among patients living with immunodeficiency syndrome.

We investigated the prevalence of CMV among seropositive cases of human immunodeficiency virus (HIV) in Northern India. In this study we observed the relationship between CMV infections and CD4+T cell counts in the naive HIV positive cases.

Anti-CMV IgM + IgG antibodies were detected in 19 (8.63%) and only anti-CMV IgG antibodies were detected in 201(91.63%) of HIV positive cases..No patient was detected positive only for CMV igM antibody This may be because in HIV infected individuals, IgM antibodies are often not detectable due to profound immunosuppression.

The mean age of patients in study group was 36.65 ± 11.94 years. In the present study most of the HIV positive cases were in age group 31-40 years (26.36%), the most common route of transmission of HIV in our study was heterosexual contact (57.27%).

The study subgroup analysis of CD4+ T lymphocyte count revealed highest seropositivity of anti-CMV IgG antibodies in CD4+ T lymphocyte count < 100 cells/c mm followed by 101-200 cells/c mm. These patients would have a higher chance to develop CMV encephalitis than others who had CD4+ T lymphocyte count> 200 cells/c mm. In clinical practice, CD4+ T lymphocyte count is considered to be a prognostic / or risk factor to monitor the progression of HIV infection. CMV encephalitis is reported to occur at CD4 count< 200 cells/c mm.

Human cytomegalovirus (CMV) poses an important public health problem as it may cause serious morbidity and mortality in Immuno-compromised patients, most notably transplant recipients and HIV-infected persons. It is probably one of the most common infections known to humans and is characterized by a self limiting infection in healthy individuals. The emergence of AIDS in India has necessitated the establishment of reliable tests for diagnosis of cytomegalovirus infection as damaged immune system permits cytomegalovirus reactivation. The magnitude of this problem in India and the various diagnostic modalities used has not been adequately investigated and hence CMV infection is still a major health problem warranting strong preventive measures. The ultimate goal of the prevention program is to develop a vaccine that can be administered to sero negative women of childbearing age to prevent primary infection during pregnancy.[4] and early diagnosis and treatment of same in immunocompromised (HIV/AIDS) patients to reduced morbidity, mortality and patient care cost.

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