ORIGINAL RESEARCH PAPER

Microbiology

SCREENING OF URINE SAMPLE OF PREGNANT WOMEN FOR CMV INFECTION IN A TERTIARY CARE HOSPITAL

KEY WORDS: Cytomegalovirus, pregnant women ,intrauterine infection, inclusion bodies

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ABSTRACT

Cytomegalovirus (CMV) infection in pregnancy is too common occurring primarily as well as recurrently due to reactivation of latent infection. The primary CMV infection during pregnancy is associated with numerous complications . Infection is routinely diagnosed by microscopy(pathognomonic **owl's eye intranuclear inclusions) which** is further confirmed by other methods like immunofluorescence assay , ELISA assay , CFT , PCR or in situ DNA probe hybridization assays which is used to detect viral DNA in biopsies, blood, bronchoalveolar lavages, and urine samples .

Aims & objective : Screening of urine sample of pregnant women for CMV infection in a tertiary care hospital .

Results : A total of 104 urine samples of pregnant women coming for ANC were screened for CMV by microscopy between May 2017 and August 2017 . There were 12 samples (11.54%) which were positive by direct microscopy . Of these pregnant females , 21 cases (20.19 %) were positive by serological test for CMV infection , which included the cases which were positive by microscopy .

Conclusion: There should be a mandatory screening of all females in child bearing age group for primary CMV infections .

INTRODUCTION

Cytomegalovirus (CMV), a member of Herpesviridae family is an important cause of multiple organ dysfunction in the immunocompromised host ą. Patients can present with hepatitis, pneumonitis, ulceration of the oesophagus or colon, retinitis, or encephalitis. Organ involvement is routinely diagnosed by biopsy, with visualisation of pathognomonic **owl's eye intranuclear inclusions** in stained tissue sections.[2,3] CMV (human herpesvirus 5) is the prototype member of the alpha-herpesviridae, a subfamily of the Herpesviridae family of human DNA viruses.[4] Three groups of patients are at risk for invasive acute CMV disease: (1) newborn infants infected in utero, (2) immunocompromised allograft recipients and (3) patients with AIDS. Infants infected in utero may be born with subclinical infections or may have a constellation of clinical abnormalities characteristic of what has been termed cytomegalic inclusion disease (CID) of the newborn. Clinical findings include hepatosplenomegaly, jaundice, thrombocytopenia, purpura, microcephaly, chorioretinitis and, rarely, pneumonia in approximately 10% of congenitally infected infants. Mortality rates range from 11 to 20% in symptomatic infection, and up to 50 % of long-term survivors of symptomatic infections will have deficits in perceptual and cognitive functions. A significant number of infants with asymptomatic infections are also at risk of developmental abnormalities, hearing loss being the most common. Persistent infection with prolonged viral shedding is nearly universal in infants with either symptomatic or asymptomatic congenital infection[5]. CMV infection is a common cause of congenital birth defects. The virus is included in the TORCH panel for disease screening in infants [6].Intrauterine infection caused by Cytomegalovirus (and to a lesser extent perinatal or neonatal infection) may be associated with developmental abnormalities and mental impairment-particularly if the mother is primarily infected during pregnancy[7].

CMV can be cultured from most body fluids for extended periods following primary infection with significant amounts of infectious virus being found in urine, genital secretions (including semen), saliva, and breast milk. Virus is also readily transmitted by cellular elements in blood products, especially leucocytes, and by solid organs during transplantation

Diagnosis :

Diagnosis of a CMV infection can be confirmed by detection of CMV-induced large inclusion bodies present in urine sediment. The owl's eye appearance of CMV-infected cells can easily be seen in tissue or organ preparations from any part of the body. Cells are enlarged and contain intranuclear and intracytoplasmic inclusions and peripheralized chromatin. An atypical lymphocytosis is also present in a complete blood count. The ability of CMV to grow in cell culture from the patient is the most reliable mode of diagnosis. Viral antigens can be detected with an immunofluorescence assay. An ELISA can be used to detect antibodies to CMV in the serum. PCR or in situ DNA probe hybridization assays can be used to detect viral DNA in biopsies, blood, bronchoalveolar lavages, and urine samples. Complement fixation can be used to detect CMV-IgM antibodies in infants infected with CMV in utero.[12,13,14]

Aims:

Screening of urine sample of pregnant women for CMV infection in a tertiary care hospital.

Materials and methods :

Midstream urine sample was collected from 104 pregnant females under aseptic precautions, in a universal , sterile, wide mouthed, screw-capped container, after obtaining written, informed voluntary consent of the patient.

About 2 ml of collected urine was taken in a sterile glass test tube, and mixed with 2 ml of 95% ethanol and kept for 30 minutes. This was centrifuged for 15 minutes at 3000 rpm. The supernatant was discarded and from sediment, 2 smears were prepared (about 2 cm diameter circular smear). After that , it was air dried and fixed with Methanol, and stained with Giemsa stain, diluted 1 in 20 in Phosphate buffered saline (pH 7.2). Then slides were washed, dried and observed at 100X oil immersion field for Owl eye inclusion bodies (Compact nucleus with large concentric perinuclear halo inside transitional epithelial cells).

Wherever possible, data were matched with results of CMV serology from the patient's antenatal card.

Time: May 2017 to August 2017.

Place: Microbiology laboratory , AIIMS , Patna

Type: This was a lab-based observational study.

Statistical method: Simple method was used to study the prevalence.

Results and Discussion :

A total of 104 urine samples of pregnant women coming for ANC were screened for CMV by microscopy between May 2017 and August 2017 .

There were 12 samples (11.54%) which were positive by direct microscopy (Owl eye inclusion bodies were seen) . Of these pregnant females , 21 cases (20.19 %) were positive by serological test for CMV infection (IgM antibodies) , which included the cases which were positive by microscopy **.**

Majority (45%) of pregnant women were found in females aged 25-30 years followed by 19-24 years (34.4%).

Screening of pregnant females for CMV specific IgM antibodies is beneficial in alerting the physician/ pediatrician regarding possible infection to the new born. The entire suspected new born can further be subjected to the testing for CMV specific IgM antibodies. It will help in timely intervention to prevent spread of infection to other kids by infected child. Also timely medical treatment can be started to overcome various complications in an infected child. Moreover, primary infection in pregnancy has a higher incidence of symptomatic congenital infection and fetal loss.[25] However;infected infants can be symptomatic at birth with 1015% of them subsequently developing the late sequelae like visual and auditory defects.[25] Hence it will be better to screen all the females falling in the child bearing age groups including pregnant women for CMV .

Conclusion:

There should be a mandatory screening of all females in child bearing age group for primary CMV infections .The prevalence of CMV infection in pregnant patients by direct microscopy is a non-invasive mode of diagnosis of antenatal CMV infection, in order to prevent congenital and perinatal transmission.

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