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### RESEARCH ARTICLE

#### CYTOMEGALOVIRUS INFECTION IN CRITICALLY ILL PATIENT.

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#### Abstract

The role of cytomegalovirus infection in contributing to outcomes in critically ill immunocompetent patient has not been fully defined. Active infection is observed in ICU patients and in more the 20% of ICU patient - positive serology. More studies are needed to identify factors that could predict the risk of developing a CMV reactivation, mechanism causing CMV pathogenicity and predisposing immunologic conditions associated with the development of CMV reactivation. Clinically significant CMV disease (reactivation of previously latent infection or newly acquired infection) frequently develops in immunocompromised patients. Cytomegalovirus can cause a wide spectrum of infection in immunocompetent hosts and multisystem involvement (fever of unknown origin). The case of cytomegalovirus activation in immunocompetent patient is presented. The case challenges diagnosis and identification of CMV and patient management.

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#### Introduction:-

Cytomegalovirus is major  $\beta$  herpes virus an human pathogen a double-stranded DNA virus and a member of the Herpesviridae family. The other family members include herpes simplex virus type 1 and herpes simplex virus type 2, varicella zoster virus (VZV), human herpes virus (HHV)-6, HHV-7, and HHV-8(1,2).

Clinically significant CMV disease (reactivation of previously latent infection or newly acquired infection) frequently develops in patients immunocompromised by HIV infection, solid-organ transplantation, or bone marrow transplantation, as well as in those receiving high-dose steroids, tumor necrosis antagonists, or other immunosuppressing medications for conditions such as systemic lupus erythematosus rheumatoid arthritis, Crohn disease, or psoriasis, among others(4,5,6).

CMV can cause a wide spectrum of infection in immunocompetent hosts, severe community-acquired viral pneumonia, liver (transaminitis), spleen (splenomegaly), GI tract (colitis), CNS (encephalitis), hematologic system (cytopenias), and multisystem involvement (fever of unknown origin). Uncommon sites of CMV infections in immunocompetent individuals include the kidneys, adrenals, salivary glands, pancreas, and esophagus(7,8,9,10).

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The lung is major organ involved in active CMV infection with end organ disease. There are no specific clinical signs. There is no radiological specificity. Sepsis, blood transfusion, corticosteroids, ARDS have been associated with the risk of CMV reactivation(11,12,13)

CMV pneumonia is defined as signs and symptoms of pulmonary disease in combination with detection of CMV in bronchoalveolar fluid or lung tissue(14). CMV detection should be performed via culture, histopathology, immunohistochemical analysis, CMV DNA PCR testing alone is too sensitive for diagnosing CMV pneumonia(15).

#### Case Report:-

32 year old man, caucasian, was admitted in ICU after vehicle accident. Diagnosis: polytrauma, head closed trauma, brain contusion, acute subarachnoid haemorrhage, scalped wound in temporal and parietal area. Closed chest trauma, lung contusion, fracture of shoulder bone, multiple and open fracture of shin bone. Excoriation of chest, abdomen, pelvic, both extremities area, multiple subcutaneous hematomas.

At admission patient was in coma (GCS 4-5), hemodynamia was unstable and was used norepinephrin infusion. In operating room have been performed scalped wound surgical treatment and left shin osteosynthesis.

Chest CT revealed bilateral lung contusion. From second day of admission developed hyperthermia  $>39-40^{\circ}\text{C}$ , leucocytosis ( $20 \times 10^9/\text{l}$ ) and rash on full body surface. After one week. On second CT scan of chest revealed bilateral, dorsal infiltration in lung parenchyma. (picture N1)



picture N1:-

On seven day after admission was identified **Nocardia spp.**  $\times 10^5/\text{l}$  in sputum. Blood culture analysis revealed **Staphylococcus aureus**  $\times 10^8/\text{l}$ . From phlegmon of femoral soft tissue also was identified **Nocardia spp.**  $\times 10^5/\text{l}$ . Sputum, urine, wound culture detected hospital pathogens on different time, pseudomonas aeruginosa and others.

Antibacterial treatment was based on data of microbial susceptibility tests. Regardless of suitable treatment, patient state was worsened. Developed Respiratory distress syndrome, hepatic dysfunction, acute renal failure, permanent hyperthermia. On twentieth day after admission was investigated blood for CMV detection. By CMV DNA PCR quantitative testing was revealed **CMV - 1812 copies/ml**.

Patient was treated with ganciclovir 5mg/kg twice a day within 2 week. From fifth day after treatment patient state was improved, temperature decreased, respiratory parameters was normalized.

There is no absolute direct proof of a negative impact of active CMV infection on the health outcomes of mechanically ventilated patients. Prospective randomized trials are lacking. Future trials should examine the potential benefits for health outcomes of using antiviral treatments. Such treatments could be prophylactic, pre-emptive or used only when there is an end-organ disease. Cytomegalovirus infection may affect health outcomes

for ICU patients. Additional prospective trials are necessary to confirm this hypothesis. The potential harms and benefits of antiviral treatment have to be weighed very cautiously in patients with severe sepsis or septic shock.

### Conclusion:-

In case of 32 years old man, the diagnosis of CMV reactivation was established by blood investigation. Cytomegalovirus can be pathogenic by decreasing host defences against other microorganisms, enhancing inflammatory response. There is dilemma, to treat or not to treat? Some randomized controlled trials evaluated the effectiveness of an antiviral therapy and one study to show increased the number of day free of mechanical ventilation. This case presented diagnosis and identification of CMV, patient management and effectiveness of an antiviral therapy in improving outcomes.

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