EuroSciCon

4th International Conference on

Digital Pathology

August 22-23, 2019
Zurich, Switzerland

Arch Clin Microbiol 2019, Volume: 10

Characterization of various pathogenic and nonpathogenic viruses among hepaocellular carcinoma patients

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Background: Human virome is a diverse network of microorganisms residing in various niches of human body. They alter structure and function of bacterial communities thus affecting human health causing infections and severe illnesses. Recent years has seen a dramatic increase of hepatocellular carcinoma cases in Pakistan, but the viral strains involved in its etiology have not yet been characterized. Epidemiological studies have shown that most cases of HCC are due to underlying virus HBV or HCV as a causative agent or viral co-infections. In a considerable number of people, coinfection with other pathogenic viruses (HEV, HIV, HPV, SEN and HSV) or certain nonpathogenic viruses (TTV, TTMDV, TTMV) might influence severity of HCC.

Material & Methods: In our study, we characterized various pathogenic and nonpathogenic viruses among HCC patients to explore potential role of viruses in promoting HCC. Qualitative analysis of viruses was done using universal and specific primers and results were confirmed by gel electrophoresis.

Findings: Our findings revealed that patients with hepatocellular carcinoma had markedly higher number of viruses detectable in the blood, compared with the healthy controls and critically ill HCV infected patients without HCC. Among the HCC patients we found that 84.5% had Hepatitis C infection, 7% had Hepatitis B and Cytomegalovirus infection each while 2.5% had Hepatitis E virus and HCV+HBV co-infection. Among anelloviruses 100% patients had TTV infection, 70% had TTMV infection, 78% have TTMDV infection and 24% have SENV while no patient was positive for HSV-1/2, EBV, VZV and HPV. Infection with more than one type of viruses was common and significant in most HCC patients. Moreover, determination of viral load and assessment of virome using broad range techniques like NGS will be of great interest allowing us to further explore complexity of disease.

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