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Detection of six human herpes virus infections by multiplex PCR assay among Egyptian pediatric leukemic patients

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Background: Our pediatric leukemic patients are at higher risk of developing herpes virus infection. Several different antivirals are effecting treating herpes virus infections. However, since different herpes virus infections presented with similar clinical manifestations, there is an increasing need for accurate and timely diagnosis of herpes infections, particularly among immunologically impaired patients suffering from disease and its treatment.

Aim: Therefore, the current study has been done for establishing multiplex PCR assay that can detect and differentiate 6 types of human herpes viruses including: Herpes simplex virus 1 & 2(HSV-1,2), varicella-zoster virus (VZV), human cytomegalovirus (HCMV), Epstein Barr virus (EBV), and human herpes virus 6 (HHV-6).

Methods: Fifty (50) pediatric leukemia patients were subjected to multiplex PCR assay to detect 6 human herpes virus (HSV1,2, VZV, HCMV, EBV, HHV6) in WBCs and sera, using specific sets of different primers at the same PCR condition. Thirty (30) control siblings served as a control group.

Results: An electrogram of multiplex PCR product showed that we have amplified the 6 herpes viruses of the expected size when used the specific sets of different primers. Multiplex PCR results have shown presence of HSV1&2 in 2%, VZV in 16%, CMV in 54%, EBV in 20% and HHV6 in 8% of patient's sera versus 6.7% and 46% for VZV and CMV respectively in the control group with significant difference ($p=0.009$ and 0.021 respectively). On the other hand, multiplex PCR results in patients' leukocytes have shown presence of herpes simplex viruses 1& 2 in 6%, VZV in 24%, CMV in 38%, EBV in 46% and HHV6 in 36% compared to HSV1&2 in 10%, VZV in 53%, CMV in 40%, EBV in 0%, and HHV6 in 63% of the controls.

Conclusions: Multiplex PCR assay is a time saving diagnostic tool that may help in patient's management by using an appropriate antiviral treatment. The most common herpes virus infection by multiplex PCR method was found to be CMV while HSV1 and 2 are the lowest frequent viral infection among our symptomatic leukemic children.

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