Prevalence of human herpes viruses 6 and 7 in CSF samples taken from children attending Sheffield Children's Hospital with febrile convulsion, meningo-encephalitis, atypical sepsis, exanthema subitum or other neurological involvement

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BACKGROUND

Although primary infections with Human herpes viruses 6 and 7 (HHV6/7) are usually brief and self-limiting in children <5 years of age, 10-24% of those with primary infection will experience serious symptoms and in a few cases neurological complications have been recorded^(2,3). The association of primary infections causing high fever, febrile illnesses, seizures, meningo-encephalitis, atypical sepsis, and other serious neurological complications are recognized, but due to limited testing are likely hugely under estimated. No UK prevalence data is available to determine the frequency of these viruses in children presenting with clinical meningo-encephalitis or neurological sequelae of HHV6/7 infection.

METHODS

- An in-house real time multiplex quantitative PCR assay for the detection for HHV6A/B and HHV7 was developed for this study.
- A one-year (January to December 2017) prevalence study was performed to determine the frequency of HHV6/7 detection in CSF.
- All samples selected had a negative bacterial culture and negative HSV, VZV and Enterovirus/Paraechovirus PCR.
- 396 CSF samples taken from children <5 years presenting at Sheffield Children's Hospital with either fever, seizures, atypical sepsis, meningitis and other neurological signs and symptoms were tested for HHV6 and 7 quantitatively.

ASSAY DESIGN

Assay Specificity

The assay was designed as a multiplex with specific primers and probes for differentiation of HHV6A, HHV6B and HHV7 targets. There was no cross reactivity between the three HHV viruses or with the internal control (murine CMV).

Limit of Quantitation

(copies/ml)	HHV6A	HHV6B	HHV7
Lower limit of detection:	10	10	10
100% sensitivity limit:	825	1650	825

RESULTS

Results from this study showed a 7.6% (30/396) prevalence of HHV6 and 7 DNA in all CSF samples tested. 0.5% (2/396) were HHV6A DNA positive, 4.0% (16/396) were HHV6B DNA positive, 3.0% (12/396) were HHV7 DNA positive, 0.3% (1/396) was co-infected with both HHV6B and HHV7. No results could be reported on one sample (0.3%) as neither HHV6/7 DNA nor the internal control was amplified.

The age of the patients in which the samples tested positive ranged from one month to five years (mean 12.5 months).

CONCLUSION

This study describes important UK prevalence data for HHV6 and 7, which have not been previously described. It highlights the need to include these viruses within routine laboratory viral CSF PCR panels. These results are similar to those of other studies worldwide although slight variations could be seen which may be due to size of sample used, protocol and assay sensitivity^(1,2,4,5).

Further analysis of the clinical presentation of these patients, their infection markers, length of hospital stay, duration of antimicrobial and antiviral treatment will be performed, to gain a better understanding of the clinical presentation of HHV6/7 infections and the impact routine testing may have on the clinical management. Their inclusion may aid quick effective management of these patients, rationalise antimicrobial prescribing and may help in reducing length of stay in hospital.

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