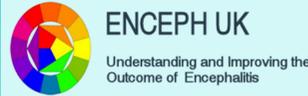


ENCEPH-UK PROGRAMME – A Pilot Study of the change in temporal lobe volumes in Herpes

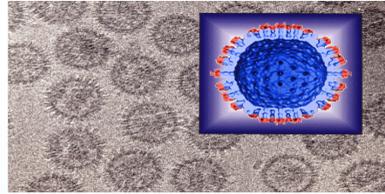
simplex virus encephalitis using stereological techniques.

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Background



Encephalitis is one of the most important types of brain injury. It is often caused by a virus, of which *Herpes simplex virus* (HSV) type 1 is the most frequent. It is rare occurring in 1 per 250,000-500,000 population, however, it still has a significant mortality and considerable morbidity in survivors often having a devastating impact on the patient, their family and carers. Outcomes remain poor despite aciclovir treatment.

Inflammation and swelling occur as part of the body's defence against infection but in the confines of the fixed space of the skull causes damage.

Temporal lobes are particularly affected and these lobes are very important for memory. In 1 study 19 out of 22 patients assessed at least 6 months after the acute illness had memory impairment at follow up.

The role of corticosteroids remains uncertain; they may improve outcome by reducing swelling and inflammation.

Aims

The objective of this study was to assess the extent of swelling and inflammation associated with HSV encephalitis using longitudinal MRI, with particular emphasis on the interventional effects of corticosteroids

Methods

- Retrospective patients with proven HSV encephalitis using standard diagnostics of clinical features along with EEG, MRI and CSF findings with a proven positive HSV-1 PCR were evaluated.
- A minimum of 2 serial MRI scans performed with the 2nd scan within 4 weeks of the 1st, including coronal FLAIR images in each acquisition without artefact.
- Cavalieri method of design based stereology in conjunction with point counting using Easymeasure® software to estimate temporal lobe volume measurements on serial MRI data.
- This approach for volume estimation has been well validated and applied to other neurological conditions. Intraclass correlation coefficients for inter-rater studies of temporal lobe volume obtained using stereology were found to be high
- Given HSV encephalitis may also affect regions outside the temporal lobe we also estimated total oedema volume on FLAIR images using stereology

Results

Quantitative longitudinal analysis revealed that the temporal lobe volume increased on average by 1.6% (standard deviation 0.11%) in 5 patients who had not steroid treatment and decreased by 8.5% in 2 patients who had received corticosteroids.

Furthermore, quantitative analyses of changes in FLAIR were found to increase on average by 9% in patients not receiving

treatment with corticosteroids and decreased on average by 29% in the 2 patients that had received treatment.

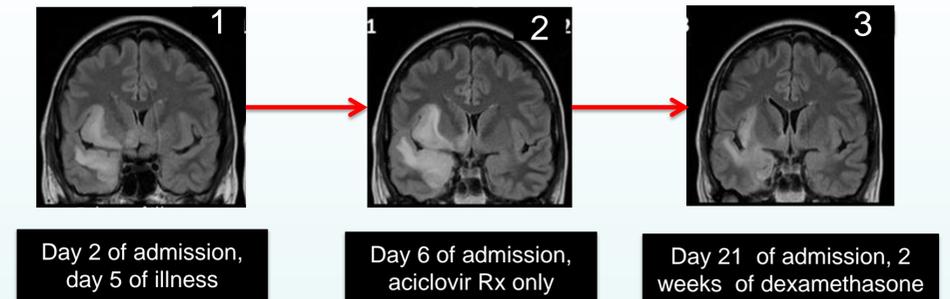


Figure: Coronal T2 –weighted FLAIR images of a 45 year old woman with HSV encephalitis. On day 7 of admission a 5 day course of corticosteroids was started

Conclusion

This preliminary study showed temporal lobe volume and oedema generally increased over 2 weeks in HSV encephalitis patients who were not treated with corticosteroids but decreased on average in those given corticosteroids. Administration of corticosteroids appears to reduce brain swelling and inflammation in patients with HSV encephalitis. These findings provided preliminary data to support the “Corticosteroids in HERpes Simplex Virus Encephalitis (COHESIVE) randomised controlled trial due to start September 2014.

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