

P1460

Poster Session V

Central nervous system infections

A PILOT STUDY OF THE CHANGE IN TEMPORAL LOBE VOLUMES IN HERPES SIMPLEX VIRUS (HSV) ENCEPHALITIS USING STEREOLOGICAL TECHNIQUES

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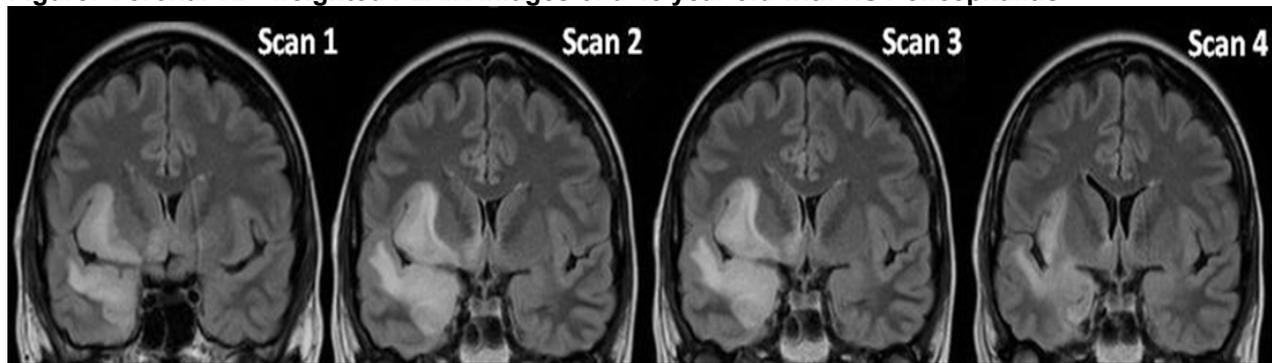
Objective: To assess the extent of swelling and inflammation associated with HSV encephalitis using longitudinal MRI, with particular emphasis on the interventional effects of corticosteroids.

Methods: Initially two hospitals were screened for retrospective cases of HSE who had repeat MRI scans within a month of their first scan. Patients with a history of HSV encephalitis based on standard diagnostics of EEG, neuroimaging and virology were included in the study. The Cavalieri method of design-based stereology, was used to estimate temporal lobe volume measurements on serial MRI data. This approach for volume estimation has been previously developed, rigorously validated (e.g. Roberts et al., 2000; Keller et al., 2012) and applied to other neurological conditions (e.g. Keller et al., 2002a, 2009, 2011). Intraclass correlation coefficients for inter-rater studies of temporal lobe volume obtained using stereology were previously found to be high (Mackay et al., 1998, 2000). Given that HSV encephalitis may also affect regions outside the temporal lobe, we also estimated total oedema volume on FLAIR images using stereology. We applied these methods to six patients with HSE who had (i) a repeat MRI within one month of the first and (ii) a coronal FLAIR image for each acquisition, without artefact.

Results:

Quantitative longitudinal analysis revealed that temporal lobe volume increased on average by 1.6% (standard deviation 0.11%) in five patients who had no steroid treatment (individual changes = -6%, 4%, -10%, 2% and 18%), and decreased by 8.5% in two patients who had steroid treatment (individual changes = -8% and -9%). Furthermore, quantitative analyses of changes in FLAIR were found to increase on average by 9% in patients who did not receive treatment (individual changes = 2%, 23%, -15%, 8%, and 27%), and decrease on average by 29% in the two patients receiving treatment (individual changes = -30% and -27%).

Figure: Coronal T2 –weighted FLAIR images of a 45 year old with HSV encephalitis



Day 2 of admission

Day 6, aciclovir treatment only

Day 7, before corticosteroids treatment

Day 21, 2 weeks after corticosteroid treatment

(illness day 5)

There is progressive increase in temporal lobe swelling and oedema from days 2-7 post admission (when the patient was treated with aciclovir only); on day 7 the patient was given a five day course of intravenous dexamethasone, and by 2 weeks later there was dramatic reduction of the extent of FLAIR hyperintensities, which is indicative of a reduction in cerebral oedema.

Conclusion: This preliminary study showed temporal lobe volume and oedema generally increased over two 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.