

P0118

Paper Poster Session

Recent advances in diagnosis of herpes viruses

A novel scoring system for assessing neurological damage in acute encephalitis on magnetic resonance images

Sylviane Defres*¹, Hedvig Juul², Simon Keller³, Kumar Das⁴, Tom Solomon⁵, Enceph-UK Study Group⁶

¹*Institute of Infection and Global Health, Liverpool, United Kingdom*

²*Institute of Infection and Global Health, 8 West Derby Road, United Kingdom*

³*Institute of Translational Medicine, Liverpool, United Kingdom*

⁴*The Walton Neuroscience Centre, Liverpool, United Kingdom*

⁵*University of Liverpool, Institute of Infection and Global Health, Liverpool, United Kingdom*

⁶*Institute of Infection and Global Health, Liverpool, United Kingdom*

Background:

Encephalitis is a rare condition, with approximately 5.23 new cases per 100,000 per year in the UK. Most commonly it is caused by a viral infection of which Herpes simplex virus (HSV) is the most common cause. Although it is rare, its impact is disproportionately large with a huge socioeconomic burden on patients their carers and the health services. Magnetic resonance imaging is recommended to aid diagnosis of encephalitis. Previous studies of neuroimaging have been mainly descriptive or correlate areas of abnormalities with clinical states or with aetiologies. However, none have quantified the areas of damage, in terms of their volume, nor in developing a score, that could correlate with these volumes of damage and also with clinical outcomes. This study aimed to quantify the damage from various causes of encephalitis and develop a scoring system.

Material/methods:

Patient scans were obtained from an NIHR funded programme of studies, ENCEPH UK, which aims to better understand encephalitis and try to improve its outcomes. Easymeasure software was used to calculate the volume measurements using the Cavalieri method of stereology with point counting. A semi quantitative scoring system was developed following the evidence of similar scoring systems in epilepsy. A variety of anatomical regions of the brain were given a score depending on the amount of FLAIR signal abnormality and architectural damage.

Results:

The neuroimaging of 37 patients were evaluated in the preliminary work. 21 of these patients had an infectious cause, of which 17 were HSV, 7 had an autoimmune cause and in 9 no aetiology was found. Patients with HSV encephalitis (HSVE) had the highest mean damage score and the largest mean damage volume. There was a strong correlation between the damage score and the total volume of damaged brain tissue on FLAIR. Mean temporal volume for all patients was smaller in patients with good outcome, but not statistically significant however for HSVE patients the difference

was statistically significant (oneway ANOVA, $F=22.371$, $p=0.018$). Analyses will be updated with further results.

Conclusions:

The preliminary pilot work has shown a good correlation between volumes measured by Easymeasure and a novel scoring system, with the latter being quicker to perform. It potentially could be used to correlate with clinical outcomes from encephalitis. Further work is needed to evaluate its effectiveness in correlating with clinical outcomes and it may also be useful as a predictive tool for those who may have poorer outcomes and hence require further support and rehabilitation.