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A clinicopathological study of complex partial seizures with mesial temporal sclerosis and dual pathology: It's contribution in post-surgical outcome

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Background and Objective: Complex Partial Seizure (CPS) with or without secondary generalization accounts for 20-23% of epilepsies in India. In medically refractory CPS responding to epilepsy surgery, resected hippocampus and temporal lobe can have distinct dual pathologies. That is, Ammon's horn sclerosis and extrahippocampal cortical dysgenesis, tumour, vascular malformations.[1] This is a study to evaluate the influence of dual pathology as observed in resected temporal lobe on final outcome of CPS patients undergoing surgery.

Methods: Retrospective analysis of cases of medically refractory CPS that had undergone temporal lobectomy from February 1999 to June 2000 was carried out, with review of the medical records and histopathology. Fifteen patients with pure mesial temporal sclerosis (MTS), and 11 patients with Ammon's horn sclerosis and associated extrahippocampal pathology (excluding tumour) in the resected tissue (dual pathology), were selected for evaluation. This involved clinical and pre-surgical evaluation with post surgery follow-up for 2 years. Cellular pathology in hippocampus and temporal lobe was evaluated for the presence of dystrophic neurons, aberrant synaptic labeling by immunohistochemistry using antibodies to synaptophysin, S100, phosphorylated and non-phosphorylated neurofilaments.

Results: Eleven patients (73%) with MTS and 5 patients (46%) with dual pathology had early onset (<12 years of age) of disease. Ten patients (67%) with MTS and 3 patients (27%) with dual pathology had history of febrile convulsion in childhood prior to the onset of epilepsy. Frequency of seizure (2-4/month) was almost the same for both single and dual pathology at the time of surgery. EEG and MRI could not differentiate between single and dual pathology though EEG lateralisation was more specific in cases with pure MTS (15/15 patients) than dual pathology (7/11 patients). Neuropsychological evaluation was concordant with MRI in 9 patients (60%) with single pathology and 5 patients (46%) with dual pathology.

The pathological changes of patients with single pathology were that of Ammon,s horn sclerosis. They were: Neuronal loss in dentate gyrus, lamination of dentate gyrus, malorientation of pyramidal neurons, significant CA3 neuronal zone depletion, and dense perineuronal synaptic labeling by synaptophysin. The changes in patients with dual pathology were: Ammon's horn sclerosis with cortical dysplasia (7/11), Ammon's horn sclerosis with microdysgenesis (4/11) and significant CA3 neuronal zone depletion (5/11).

Thirteen patients (87%) with pure MTS had excellent post-surgical outcome (Engel's outcome scale grade 1[2]) while 6 patients (55%) with dual pathology showed Engel's grade 1 outcome. Five patients (45%) with dual pathology had comparatively poor outcome. The hippocampus in patients with poor outcome showed significant pyramidal neuronal loss in CA3.

*Conclusion: MTS patients with e*xtrahippocampal lesion and cytoarchitectural abnormalities (dual pathology) has worse post-surgical outcome as compared to patients with pure MTS. It is thus worthwhile to evaluate those patients with poor outcome after epilepsy surgery for possible presence of dual pathology. Also, temporal lobectomy along with amygdalohip-pocampectomy can ablate

extrahippocampal pathology as well as Ammon's horn sclerosis, thus potentially improving the surgical outcome.

References

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