cognitive changes after epilepsy surgery, irrespective of type of surgery. Among the assessments, there are no statistically significant changes in the neuropsychological outcomes, though, there is an evidence of clinically significant results, however, due to small sample size, no conclusive claim can be made.

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Oxidative stress in human epilepsy

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Introduction: A series of oxidative stress studies in Kanic Acid induced epileptic brain, found that malondialdehyde (MDA) was about 51% higher (Gupta, 2002), mitochondrial superoxide(O_2^-) and DNA氧丸損傷指標 (8-Hydroxy-2-deoxyguanosine) were increased (Liang, 2000), and extracellular fluid hydrogen peroxide was increased (Layton, 1999). Clinically higher Hcy tended to developed seizures. In epileptic patients, plasma Vit. 6, folic acid and Vit. 12 all decreased. Thus a oxidative stress may play and important role in epilepsy.

Material and methods: We recruit 15 cases of epilepsy surgery. The epileptic focus was localized according to preoperative and intra-operative ECoG spikes. The resected epileptic brain and non-epileptic brain was used for oxidative stress and antioxidant study including: 1. 氧丸壓力指標: ROS, Hcy及 MDA, 2. 抗氧丸物含量: Vit. C, B_6, 3. 抗氧丸能力指標: SOD, catalase, GPx, GR及GSH/GSSG.

Results: Among these 15 patients, their age ranged from 8 to 63 year-old with a mean of 32 ± 16, and gender of 5 males and 10 females. The ROS (RLU/mg tissue/s) were 10,890 ± 9541 in epileptic hippocampus, 10,887 ± 8704 in epileptic cortex and 5112 ± 2077 in non-epileptic cortex respectively. The MDA (μM/g tissue) were 8570 ± 4181 in epileptic hippocampus, 8821 ± 5953 in epileptic cortex and 8300 ± 4757 in non-epileptic cortex respectively. The SOD (unit/mg protein) was 42,798 ± 34,372 in epileptic hippocampus, 42,082 ± 20,599 in epileptic cortex and 36,947 ± 17,035 in non-epileptic cortex respectively. There were no prominent differences of GPx, GR, GSH, GSSG, GSH/GSSG and ATP. It seemed that ROS MDA and SOD all increased in epileptic brain. ROS and MDA were also higher in post-operative non-seizure freedom patients. ROS was also higher in seizure history longer than 1 year.

Conclusion: Higher oxidative stress and lower anti-oxidant patient tended to have seizure recurrence after epilepsy surgery. Longer seizure history may have higher free radicals.

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2015 AESC Lecture

Epilepsy surgery care in Taiwan

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Taiwan is an island with a population of 24 million. Over 95% have been covered by National Health Insurance. The age-adjusted prevalence was 5.85 per 1000, and incidence was 97 per 100,000 person-years. Taiwan may be divided in 4 regions geographically, namely north, central, south and east. There were excessive epilepsy patients in east Taiwan, predominantly in the young and middle aged group.

The total expense for epilepsy treatment was NT 1.6 billion ($ 52 millions). OPD visit was 8.4/year per patient with expense of NT 2159 ($ 72) per OPD. The anti-epileptic drug (AED) expense was NT 900 millions in year 2007, and increased up to 2 billion in year 2009. AED expensed was NT 1145 ($35) per OPD, about 53% of OPD expense.

Epilepsy surgery program was started by Professor His YS in 1987, followed by Professor Chang CN in 1988. Until now, there are only 5 epilepsy surgery programs among 19 medical centers in Taiwan, Taipei Veteran General Hospital (both adult and pediatric), Chang Gung Memorial Hospital, Tzu-Chi General Hospital and Taichung Veterans General Hospital (mainly VNS).

The epilepsy surgery includes awake craniotomy, intraoperative cortical functional mapping, epilepsy with lesion, Temporal lobe epilepsy, Frontal lobe epilepsy, implantation of subdural grid and strip, depth electrodes, foramen ovale electrodes, Callosotomy, Multiple sub-pial trans-section, vagus nerve stimulation, deep brain stimulation and cortical stimulation.

In the past ten years, about 50–60 cases of epilepsy surgery were done annually in Taiwan. As compared to the other developing or developed countries, it is slightly under performed after such a long history of over 20 year's development. There is still a tremendous space for us to continue more hardly.

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