

STRESS AND EPILEPSY

M. Trimble

Institute of Neurology, Queen Square, London, UK

member@mtrimble.wanadoo.co.uk

The arguments that stress and epilepsy are associated will be made from three levels. First the clinical, second the epidemiological and third the experimental. It will be made clear at the outset that the presentation will neither be about non-epileptic attacks nor about reflex epilepsy provoked by specific thoughts.

The great neurologist Hughlings Jackson considered that the general change in the body which occurred with strong emotions could lead to a discharge of unstable nerve cells. Epidemiological work has shown an association in some patients between stress and seizures – the proposition has not been refuted (Friis and Lund 1974; Temkin et al 1984; Milton et al 1987; Mattson 1991; Christensen et al 2007; Thapar et al 2009). In some of these studies the temporal relationship between recorded stress and seizure occurrence has been examined.

Animal investigations have shown that stress leads to a lowering of the seizure threshold (Swinyard et al 1963). In humans, Stevens (1958) showed the effects of “strong emotional stimuli” on the EEG especially of those with psychomotor epilepsy and studies where depth electrodes, spectral analysis, and prolonged monitoring have been used to examine the effect will also be quoted supporting the proposition (Groethuysen et al 1957; Berkhout et al 1969; Stores and Lewin 1981).

Finally the plausibility of the proposition will be explored. The mechanisms include co-morbid psychiatric illness (especially depression and anxiety), with alteration of the sleep pattern (sleep deprivation increasing seizures), biochemical links related especially to both depression and epilepsy (serotonin and GABA), and anatomical associations via limbic structures especially the hippocampus. The architecture of the latter structure is altered by stress, is linked with depression and is affected by epilepsy. It is a source of seizures. Kindling experiments have shown associations between Corticotrophin Releasing Factor, seizure threshold and limbic structures. The possible role of early life stress and the development of epilepsy will be discussed, as will the growing awareness of the high prevalence of co-morbid anxiety and depression in epilepsy and the impact that such co-morbid disorders may have on control of seizures.