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The role of vagal nerve stimulation (VNS) on neuroimmunologic aspect of epilepsy

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Epilepsy is one of most frequent neurologic health problem, affecting nearly 1% of world population. It is a chronic disorder characterized by recurrent, sudden, unprovoked seizures of cerebral origin with motor, sensory, autonomic disturbance with or without conscious loss. There is up to 25 % of resistant subgroup of epileptic patients where pharmacologic antiepileptic therapies are insufficient. VNS is an approach for specific resistant epileptic cases when epileptic surgery can't be feasible.

The idea of a link in between epilepsy and immune system is present at for the last 30 years. Immunologic alterations in epileptic patients, some favorable responses of resistant epileptic syndromes to immunomodulatory treatment and association of certain obvious immune – mediated diseases with epilepsy all support this link. The presence of autoimmune epilepsy and responsive states of some epileptic syndrome for immunotherapy encourage this hypothesis.

Pro-inflammatory cytokines such as IL-1β, IL-2, IL-6 and TNF-α have a correlation in seizure. Besides, there is association between epilepsy and certain autoimmune diseases. Therefore, some antibodies (such as; $GluR_3$, Phospholipid, cardiolipin, β2-Glycoprotein I, nuclear, Haemocyanin, antiprothrombin and GAD) are all important in autoimmune epilepsies. CSF findings (Oligoclonal bands, elevated IgG Index) and venous blood findings (Ig G, M, A, D, E) are other evidences for association of epilepsy and/or immunology.

From July 2012 to January 2015, totally 5 pharmaco-resistant epileptic patients are studies on behalf of this ideas. These selected patients are important because of that all of them are VNS patients. All patients were evaluated with aforementioned cytokines, immunoglobulin and some specific antibodies just pre – implantation and 6 mo / 1 y post – implantations.

Interestingly the most specific findings are correlated with cytokines rather than Ab's able to be studied. Most of blood immunoglobulin is not changed in times. But the striking changes belong to IL-1β decrement and IL-6 significant decrement in serum concentration with elongation of time.

For the last years, the pro-convulsive and neuro-protective roles of cytokines have an increasing importance in epilepsy. Desperate group of patient with epilepsy rely upon new era approaches such as VNS. The exact curative role of this vagal stimulation is still dilemma; but in resistant epilepsy especially good selected patients VNS is gaining an increasing appreciation with a % 50 improvement in seizure frequency and impact.

With this study, an untouched aspect of Vagal Nerve Stimulation is tried to be displayed. so that, in passing time period, the cytokine levels of patients start to improve. This may indicate that vagal stimulation may play a role in neuro-immunity of resistant epileptic patients. Since our sampling patient group is so small, there should be more investigation on "the role of VNS in immunology of resistant epilepsy".

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