West syndrome

Epileptic spasms, infantile spasms, juvenile spasms, West syndrome or West's syndrome is an uncommon-to-rare epilepsy in infants, children and adults. It is named after the English physician, William James West (1793–1848), who first described it in an article published in The Lancet in 1841.

The original case actually described his own son, James Edwin West (1840–1860).

Other names for it are “Generalized Flexion Epilepsy”, “Infantile Epileptic Encephalopathy”, “Infantile Myoclonic Encephalopathy”, “jackknife convulsions”, “Massive Myoclonia” and “Salaam spasms”. The term “infantile spasms” can be used to describe the specific seizure manifestation in the syndrome, but is also used as a synonym for the syndrome itself. West syndrome in modern usage is the triad of infantile spasms, a pathognomonic EEG pattern (called hypsarrhythmia), and developmental regression - although the international definition requires only two out of these three elements.

The syndrome is age-related, generally occurring between the third and the twelfth month, generally manifesting around the fifth month. There are various causes (“polyetiology”). The syndrome is often caused by an organic brain dysfunction whose origins may be prenatal, perinatal (caused during birth) or postnatal.

Epileptic spasms (ES) and tonic spasms (TS) appear in children with West syndrome and symptomatic generalized epilepsy. Both types of spasms are often characterized by truncal muscular contractions and ictal electroencephalography (EEG) findings comprising the contiguous phases: phase 1) 15-20 Hz, spindle-like fast activity (occur in 70%), 2) diffuse polyphasic δ/θ waves (100%), and 3) electrodecremental activity (70%) [1)].

Case series

Okanishi et al. examined the effect of VNS on these spasms that are uniformly associated with the EEG and electromyogram changes.

A consecutive series of 32 patients satisfied the inclusion criteria consisting of 1) medically refractory epilepsy, 2) VNS implantation between 2010 and 2015, 3) implantation of VNS before the age of 20 years, and 4) follow-up >2 years. From this cohort, 16 patients had spasms (ES/TS group), whereas the remaining 16 had partial seizures with or without secondary generalization (PS/SG group). We compared seizure outcomes between the two groups, and also determined the factors predicting these outcomes within the ES/TS group.

The outcomes after 2 years of implantation, defined using the McHugh classification, were as follows: II (for 2 patients), III (5), and V (9) in the ES/TS group; and I (3 patients), II (6), III (2), IV (1), and V (4) in the PS/SG group. The ES/TS group had significantly worse outcomes than the PS/SG group ($p = 0.024$, Mann-Whitney U test). Multivariate ordinal logistic regression analysis revealed that shorter mean durations of ictal events were associated with better seizure outcomes following VNS implantation ($p = 0.007$).

Only 13% of the patients in the ES/TS group had seizure reductions of greater than 50%. VNS was less

effective for the treatment of patients with ES/TS than for those with PS/SG and those described in previous studies [2].

2015

Milburn-McNulty et al. included one trial with 37 participants with a new diagnosis of West syndrome. Sulthiame was given as an add-on therapy to pyridoxine. No data were reported for outcomes 1), 3) or 6). Overall risk ratio with 95% confidence intervals (CI) for complete cessation of seizures during a nine-day follow-up period versus placebo was 0.71 (95% CI 0.53 to 0.96). Meaningful analysis of time to treatment withdrawal and adverse drug effects was not possible due to incomplete data.

Sulthiame may lead to a cessation of seizures when used as an add-on therapy to pyridoxine in patients with West syndrome. The included study was small and had a significant risk of bias which limits the impact of the evidence. No conclusions can be drawn about the occurrence of adverse drug effects, change in quality of life or mean reduction in seizure frequency. No evidence exists for the use of sulthiame as an add-on therapy in patients with epilepsy outside West syndrome. Large, multi-centre randomized controlled trials are necessary to inform clinical practice if sulthiame is to be used as an add-on therapy for epilepsy [3].

[1], [2]
Okanishi T, Fujimoto A, Nishimura M, Kanai S, Motoi H, Homma Y, Enoki H. Insufficient efficacy of vagus nerve stimulation for epileptic spasms and tonic spasms in children with refractory epilepsy. Epilepsy Res. 2017 Dec 15;140:66-71. doi: 10.1016/j.eplepsyres.2017.12.010. [Epub ahead of print] PubMed PMID: 29287185.

[3]
Milburn-McNulty P, Powell G, Sills GJ, Marson AG. Sulthiame add-on therapy for epilepsy. Cochrane Database Syst Rev. 2015 Oct 28;10:CD009472. [Epub ahead of print] Review. PubMed PMID: 26510094.