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The mystery of the Doctor's son, or the riddle of West syndrome

Paul Eling, PhD, **Willy O. Renier, MD, PhD**, **Joern Pomper, Cand Med**, and **Tallie Z. Baram, MD, PhD**
Nijmegen Institute for Cognition and Information (Dr. Eling), and Institute of Neurology and Department of Child Neurology (Dr. Renier), University of Nijmegen, the Netherlands; and Departments of Pediatrics and Anatomy/Neurobiology (J. Pamper and Dr. Baram), University of California at Irvine

Abstract

Although the eponym "West syndrome" is used widely for infantile spasms, the originators of the term and the time frame of its initial use are not well known. This article provides historical details about Dr. West, about his son who had infantile spasms, and about the circumstances leading to the coining of the term West syndrome.

Dr. West's letter to *Lancet* regarding his son

In 1841, the general practitioner W.J. West from Tunbridge wrote a letter to the editor of *Lancet* entitled "On a peculiar form of infantile convulsions."[1] West's goal was to draw the attention of his colleagues to "a very rare and singular species of convulsions peculiar to young children." He described his son's symptoms in detail, in a letter conveying both the objectivity of the physician and the frustrations of a father with a severely ill child. This description includes all of the features of the entity currently called "infantile spasms" (the entire letter can be found in Duncan[2]).

> The child is now near a year old; was a remarkably fine, healthy child when born, and continued to thrive till he was four months old. It was at this time that I first observed slight *bobbings* of the head forward, which I then regarded as a trick, but were, in fact, the first indications of disease; for these bobbings increased in frequency, and at length became so frequent and powerful, as to cause a complete heaving of the head forward toward his knees, and then immediately relaxing into the upright position, something similar to the attacks of emprosthotonos*; these bowings and relaxings would be repeated alternately at intervals of a few seconds, and repeated from ten to twenty or more times at each attack, which attack would not continue more than two or three minutes; he sometimes has two, three, or more attacks in the day; they come on whether sitting or lying; just before they come on he is all alive and in motion, making a strange noise, and then all of a sudden down goes his head and upwards his knees; he then appears frightened and screams out; at one time, he lost flesh, looked pale and exhausted, but latterly he has regained his good looks, and, independent of this affection, is a fine grown child, but he neither possesses the intellectual vivacity or the power of moving his limbs, of a child of his age; he never cries at the time of the attacks, or smiles or takes any notice, but looks placid and pitiful, yet his hearing and vision are good; he has no

Address correspondence and reprint requests to Dr. Paul Eling, NICI; P.O. Box 9104, 6500 HE Nijmegen, the Netherlands; eling@nici.kun.nl.

> power of holding himself upright or using his limbs, and his head falls without support [p. 724].

Dr. West was unfamiliar with the entity of infantile spasms, which was "the problem" with his son. Indeed, even 160 years after his description, relatively little is known about the etiology and pathophysiology of the brain mechanisms involved in this seizure disorder.[3–5] Two additional mysteries in this saga involve Dr. West himself and the origin of the term "West syndrome."

Sleuthing Dr. West's identity

Biographic details on Dr. West were obtained from a file in the Tonbridge local studies library, including a, short biography on West by Pies and Beardamere.[6] In essence, William James West was born in 1794, but his place of birth is unknown. He became a Member of the Royal College of Surgeons in 1815 (at 21 years of age). By then, he was already working in Tonbridge (interchangeable with Tunbridge but distinct from Tunbridge Wells, which lies ≈ 14 km to the south). West married Mary Dashwood in 1828; his first child, Julia, was born a year later. A second child, William, was born approximately 1834/1835. William died in 1848 of "dropsy" (hydrops, a term for ascites, implying cardiac or renal failure), and his grave is still found in the cemetery of the St. Peter and Paul parochial church in Tonbridge. James Edwin, the focus of the letter, was born on February 13, 1840. In 1853, he was transferred to the Earlwood Asylum for the Feeble-Minded in Redhill. He died on September 27, 1860 (i.e., at 20 years of age), and was buried in his father's grave.

The mysterious illness of Dr. West's son

Dr. West's description of infantile spasms is still considered a classic. As described in the letter, the spasms often begin during the first year of life, occur in series, and may arise in infants who are otherwise seemingly healthy. However, these infantile spasms are associated with intellectual and motor deterioration. As noted in his letter, Dr. West assumed that the spasms were caused by an irritation of the nervous system, perhaps caused by teething. Attempting to treat this neuronal irritant, he initiated leeches and wet towel applications, and considered "calming tonics" as well as "calomel" (mercury-chloride). Dr. West then proceeded to treat the potential source of this nervous irritation, "phlogiston," an ethereal substance assumed to be present and active in flammable matter. Phlogiston was generally regarded as the mechanism for the production of both fire and fever. Initially, the infant was put on a hot bath regimen. However, 4 weeks later, when the seizures were even worse, Dr. West turned to stronger calming agents (sedatives), including opium. When these "first-line" agents failed, West treated his then 8-month-old boy with drugs *(alterantia),* which, according to the Galenic system, alter the composition of body humors. However, neither these nor castor oil were effective. Notably, Dr. West attempted to treat his son's malady by making assumptions about its etiology and pathophysiology. When this approach failed, he relied on "standard" potions in the medical armamentarium of his day. This might be contrasted with current approaches: efficacy of certain treatments for infantile spasms (e.g., corticotropin [ACTH],[5,7–9] glucocorticoids,[8,9] vigabatrin[10]) was established empirically. This efficacy, in turn, has provided the basis for several current hypotheses regarding the pathophysiology of this disorder.[3–5,11–13] In addition, medical armamentaria change: steroids are commonly used as last-ditch agents today. Had they been available to Dr. West, his son's spasms might have remitted,[8,9] and the letter to the *Lancet* would not have been written.

When his own treatments failed, Dr. West took his son to London for expert opinions. Both of his consultants, Drs. Clarke and Locock, recognized his son's symptoms. Clarke termed them "Salaam convulsions," referring to the characteristic Arabic greeting, with bowing of

the head. Clarke had seen four and Locock had seen two of these cases previously. Thus, the entity of infantile spasms had been recognized previously and was not discovered by West.

Where and when did the term "West syndrome" originate?

In Western literature, the 100-year period after West's letter includes few papers on infantile spasms and the entity known today as West syndrome, and these papers were mainly from Germany and France. The first follow up of four cases, including the Doctor's son, was by Newnham, in 1849.[14] Newnham did not refer to West syndrome, but used the term "eclampsia nutans." Féré[15] described *tic de Salaam* or *salutation* and cited several previous authors including West. Féré" recognized that these "tics" might also result from CNS disorders such as birth trauma, meningitis, or stroke. He also noted the association of the spasms with mental retardation, and he was the first to distinguish between symptomatic and idiopathic forms of infantile spasms. This distinction was reintroduced by Zellweger in 1948.[16]

In Germany, the terms *Blitz-Nick-und Salaam-krdmpfe* and variants, and *Propulsiv petit mal* were used. Vazquez and Turner[17] described 10 cases of a—in their view—new syndrome: *epilepsia generalizada en flexion.* This was characterized by flexion spasms, mental retardation, and an EEG showing specific abnormalities, consisting of a slow background activity and diffuse spike waves. This study is most likely the first to provide the complete description of the entity known today as West syndrome, including clinical, electrophysiologic, and developmental data. Soon thereafter, Gibbs and Gibbs[18] described the EEG phenomena for which they introduced the term "hypsarrhythmia." They are generally credited with establishing the triad of diagnostic criteria for the infantile spasms syndrome, which consists of clinical spasms, hypsarrhythmia on interictal EEG, and subsequent mental retardation.

Throughout this 100-year epoch—between West's letter in 1841 and until 1960—no mention of the term "West syndrome" is found in the literature. Thus, how and when did this term for the triad of infantile spasms arise?

In 1960, Gastaut organized the 9th Colloque de Marseille (Marseille Colloquium), which focused on infantile spasms. The proceedings of this meeting have been published in the book *L'Encephalopathie Myoclonique Infantile avec Hypsarythmie* (infantile myoclonic encephalopathy with hypsarrhythmia).[19] It was at this conference that Gastaut suggested West's eponym for infantile spasms, which is widely used for the syndrome to date. (Therefore, in the remainder of this work, and without judging future developments in advance, we shall use the term "Infantile Myoclonic Encephalopathy with Hypsarrhythmia" (IMEH) for designating this illness, except that when referring to the historical aspect of this problem we shall discuss West syndrome.)

> C'est pourqoui, dans la suite de I'ouvrage et sans prejuger de I'avenir, nous parlerons d' 'Encephalopathie Myoclonique Infantile avec Hypsarythmie' pour designer l'affection en cause et nous utiliserons le sigle: EMIH, excepté lorsque nous nous référerons à l'aspect historique du problème, où nous parlerons alors de syndrome de West [p. 19].

Coda

West syndrome remains mysterious. The limited number of patients in any given institution, and particularly the dearth of those with the idiopathic form, has precluded controlled prospective clinical studies. In addition, a generally accepted experimental animal model is not available.[3,5,20] These issues notwithstanding, this manuscript has hopefully provided answers to several of the historical puzzles associated with Dr. West and his son, James. In

addition, some of the historical mists shrouding the origin of the term “West syndrome” have been lifted. Now we simply are left with the daunting task of understanding the syndrome itself.

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