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Congenital Linkage of Lacrimation with Micturition: A Wiring Defect or Just a Spillover?

Association of lacrimation and micturition is rarely reported in the medical literature. It has been hypothesized that abnormal parasympathetic connections occur between the lacrimal nucleus and the pontine micturition center, which give rise to this finding. Here we report a 5-year-old girl who presented with tearing from both eyes whenever she passed urine.

Keywords: *Lacrimal apparatus, Parasympathetic Nervous system, Pons reflex.*

Lacrimation and the act of micturition are both under the control of the parasympathetic nervous system. Despite being so similar in their control they never go together except if emotion is attached, like pain. Lacrimation associated with painless act of micturition has been earlier mentioned in few case reports [1-3]. Here we report a young girl with this finding.

A 5-year-old girl visited the outpatient pediatric clinic in June, 2019 with complaint of tearing from both eyes during micturition, without any associated pain or discomfort. This phenomenon was witnessed by the treating doctors also. The child was delivered at full term and had achieved all milestones at appropriate age including bowel-bladder control. There was no history of a similar phenomenon occurring in near or distant family members. The examination of the external genitalia and eyes was normal. Urine analysis and ultrasound of the urinary tract were also normal. This abnormal lacrimation got resolved with injection atropine (0.25 mg intravenous bolus just before the act of micturition).

The child was advised to pass urine frequently without the urge of micturition. Lesser amount of bladder stimulation decreased the parasympathetic activity and tearing. With this bladder regime, she reported a decrease in the tearing. The parents were counseled about the benign nature of this phenomenon as it probably represented an abnormal neural connection.

Tears relate to emotions as disparate as pain, sadness, anger, frustration, happiness, and religious aspiration. Tears may be rarely attributed to a neurological disorder or disease like the syndrome of crocodile tears. In the index case, tears were linked to urination without any emotional connection.

The central nervous control of micturition is a complex arrangement between the higher centers, the pons and the spinal cord [4]. The Pontine micturition center (PMC) acts as a switch in the micturition reflex pathway and co-ordinates the activity of the bladder and the urethral sphincter [5]. This center receives input from a higher center situated in the medial pre-frontal cortex (mPFC). The supra-spinal control of bladder and orchestration of micturition is also done by the central-autonomic-network (CAN) [6]. Like the PMC, the function of the lacrimal nuclei

is also modulated by the higher centers namely the limbic system and/or CAN (medial pre-frontal cortex is a part of CAN) which controls the emotional tearing, and the trigeminal nucleus which controls the reflex tearing. No direct connection between PMC and the lacrimal nucleus (LN) has been documented till date to explain involuntary/ non-emotional tearing in association with the act of micturition.

Buwler, *et al*. [1] hypothesized that abnormal parasympathetic connections occur between the lacrimal nucleus and the PMC which are responsible for this finding. We offer two hypotheses as the neuro-physiological basis of this phenomenon. First, it is possible that some of the mPFC neurons which were destined to synapse with the PMC inadvertently synapsed with the lacrimal nucleus leading to reflex co-activation as both receive input from the medial pre-frontal cortex. Second, lacrimal reflex and micturition reflex are both controlled by autonomic parasympathetic system which can lead to simultaneous neuronal discharges. However, in the absence of functional images, no conclusion could be drawn.

Clinicians should be aware of this phenomenon, its benign nature, and that it is at best a aberrancy and not a disease.

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Late onset Job syndrome With Growth Retardation

A 9-year-old girl presented with severe eczematous lesions and multiple infections since age of 6 year with growth retardation and raised serum IgE levels, suggestive of Job syndrome. The unusual late onset of clinical manifestations of the disease is highlighted.

Keywords: *Hyper IgE syndrome, Recurrent infection, Eczema*.

Job syndrome or hyper-IgE syndrome is characterized by eczema, recurrent skin and pulmonary infection, and elevated serum IgE levels (>2000 IU/mL) [1]. It is mostly sporadic with an incidence of one in 500,000 and has an early onset in life [1]. We report a child with uneventful early childhood and disease onset at 6 years of age.

A 9-year-old girl, product of a non-consanguineous marriage, presented with history of scaling over scalp and itchy red lesions with oozing and pus discharge in the inguinal region, trunk and lower limbs for past 4 months. There was history of discharge from the right ear and the left eye for past 2 months. The child was treated for tubercular cervical lymphadenitis two years ago. Subsequently child developed repeated episodes of bronchitis and wheezing. Birth and developmental history of the child were uneventful. Her growth parameters were apparently normal till 6 years of age. The siblings were all healthy and there were no similar complaints in parents or close relatives. On examination, the child had hypertelorism, broad and flat nose with increased inter alar distance. Her height was 121 cm (3rd – 10th percentile) and weight 20 kg (3rd – 10th percentile). There were thick adherent yellowish greasy scales all over scalp with sparsening of hair, hemorrhagic crusts and serous exudate over few areas. Left eye showed mucopurulent discharge, crusting and erythema of eyelid margins with matting of eyelashes. Left ear had features of chronic otitis media. Trunk, buttocks and lower limbs showed scaling and erythema along with foul smelling purulent discharge from the erosion over the inguinal folds. Vulvovaginal candidiasis and chronic paronychia of right thumb and left index finger were present. Cervial lymph nodes were enlarged. Skeletal examination revealed scoliosis in dorsolumbar spine. No dental