Declarations of patient consent
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Revisiting Omega and Veraguth’s Sign

Sir,

Omega sign and Veraguth’s fold are two facial features classically considered diagnostic of melancholic depression. Despite of their long history and relative objectivity, these valuable signs have been forgotten in current psychiatric practice. We will revisit these signs and their relevance to current knowledge and practice.

Omega sign (also known as “omega melancholicum”) was first described in 1872 by Charles Darwin as “grief muscles” in his book, The Expression of the Emotions in Man and Animals, where he described melancholic depression in graphic details, with precocious biological insights. In 1878, Heinrich Schule, a German psychiatrist, proposed the term “the melancholic omega” for the peculiar furrowing of glabellar skin above the dorsum of the nose. It is called so because it resembles Greek alphabet &RQÁLFWVRILQWHUHVW joined at the top by a horizontal crease. It was initially reported by Otto Veraguth around 1911.

Veraguth’s fold is a similarly important visible sign occurring in chronic depression, which was described similar expression in 1924, among patients with melancholia and also schizophrenia, which he described as the “puzzlement” (Ratlosigkeit).
who observed eyelid folds typically seen in chronic depressive patients.\textsuperscript{[3]} This sign was later popularized by Heinz Lehmann’s illustration in Kaplan and Sadock’s Comprehensive Textbook of Psychiatry.\textsuperscript{[3,4]} Veraguth’s sign appears as triangular palpebral folds running diagonally from the lateral corners of the eyes, medially upward to the medial end of the eyebrows [Figure 1].\textsuperscript{[3,4]}

Omega sign is formed due to excessive and prolonged contraction of corrugator and procerus muscles, as recorded by electromyography in depressed individuals.\textsuperscript{[3]} It has been proposed that muscular activity in the eyebrow area influences proprioceptive fibers of the optic branch of the trigeminal nerve, which predominantly activate the ipsilateral ventromedial prefrontal cortex through the ipsilateral locus ceruleus, a phenomenon termed as “emotional proprioception.”\textsuperscript{[6]}

From a diagnostic point of view, Omega sign can serve as a useful clinical sign in the face of the unclear and often overlapping cluster of symptoms of the neurotic spectrum of disorders.\textsuperscript{[1]} Veraguth's sign can be useful in differentiating between dementia and pseudo-dementia (depression masking as dementia), which often leads to misdiagnosis and delay in appropriate management.\textsuperscript{[7]} It has also been proposed to use these facial markers digitally for diagnostic and monitoring purposes through computer algorithms and software programs, fostering a new era of use of innovative technology in the medical field.\textsuperscript{[8]}

The therapeutic implication of Omega sign is rapidly gaining popularity in the form of botulinum toxin injections in the glabellar area, leading to a reduction of depressive symptoms, especially in cases of blepharospasm.\textsuperscript{[9,10]} The most plausible and widely accepted explanation for this therapeutic effect is “the facial feedback hypothesis” (first proposed by Charles Darwin and William James), which postulates that facial expression influences emotional perception, thus regulating our mood state.\textsuperscript{[11]} Alternative explanations include elevation in mood because of improved social connectivity and feedback because of a more positive reciprocal firing of mirror neurons.\textsuperscript{[11]} It has also been proposed, on the basis of rat models, that botulinum toxin is directly transported by the trigeminal nerve into the amygdala and exerts direct central pharmacological effects.\textsuperscript{[11]} After the procedure, anti-depressive effects start appearing as early as 2 weeks and often last as long as 6 months, well beyond the cosmetic and esthetic effects.\textsuperscript{[10]} Common adverse effects include drooping of eyelids, bruising, erythema, and pain at the injection site, which are transient and reversible.\textsuperscript{[11]}

The diagnostic specificity of Omega sign is limited because of overlap with similar “signs” in neurology and other dystonias. “Procerus sign” is a similar neurological sign reported in atypical parkinsonism, especially progressive supranuclear palsy, characterized by contraction of corrugator supercilii and procerus muscles, leading to vertical wrinkling on the forehead.\textsuperscript{[12]} This lack of specificity and overlap with other conditions limits its value as a stand-alone clinical sign, but nevertheless, it is quite useful when used in conjunction with proper detailed history and thorough mental status examination.

In the wake of current progress in the neurobiological understanding of mental illness, we are moving toward more objective tools for diagnosis and exploring new paradigms for better management of mental illness. In this context, the Omega sign and the Veraguth’s fold assume new relevance in both diagnostic and therapeutic domains.

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