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Letter to the Editor: New Observation

An Unexpected Benefit From Face Masks During COVID-19

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A 79-year-old man gradually developed abnormal facial movements at age 51, characterized by forceful eyelid closure and facial grimacing. These movements were aggravated during stressful situations, eating or exposure to cold weather. The progression of the symptoms caused significant social embarrassment and difficulties reading. He was diagnosed with facial dystonia involving both the upper and lower face and started botulinum toxin treatment with moderate benefit during the first few years. At that time, he did not recognize any alleviating maneuver (AM) to control the dystonic contractions.

Unfortunately, the improvement from botulinum toxin subsided over the years despite adjustments in botulinum toxin dosage and the pattern of muscles injected. At age 77, due to the COVID-19 pandemic and the mandatory use of face masks in public spaces to prevent airborne spread, he noticed a major improvement in his involuntary facial movements while wearing a mask. The benefit is immediately experienced on donning the mask and equally appreciated on the upper and lower face. Interestingly, the clinical improvement was optimal while using it to cover his nose and mouth, less striking if the mask covered the mouth only, and minor when below the chin. Due to its alleviating effect, he started wearing a face mask to perform numerous activities, such as watching TV and reading a book. After removing the cover, symptoms re-emerged within a few seconds. Video 1 in the Supplementary Material demonstrates the significant improvement of the patient's dystonic movements before and after using a procedure mask.

Amelioration of facial dystonia while wearing face masks has been previously reported as possibly related to an AM.[1] In this previous study, the mask effect may correspond to a pure sensory AM, likely influencing aberrant sensory-motor integration through an overriding sensory stimulus.[2]

Phenomenologically AM is described as temporary maneuvers that improve dystonia.[2] There are several mechanisms of AM which can be classified as purely sensory, like in the case described, or active non-oppositional movements, active oppositional movements, passive motion, and complex motor maneuvers.[2] The mechanism is not completely understood, but PET imaging[3] evidence points towards a modulation effect caused by the AM improving the hyperexcitability of the cortical motor output and alleviating muscle dystonic over-contraction. A more recent functional MRI study looking at AM's effect on cervical dystonia showed a modulatory effect in the sensorimotor network, including the primary motor cortex and other frontal, parietal, and occipital areas. [4] In addition, there were differences in the bilateral cerebellar and primary motor cortex connectivity with AM imagination, adding evidence to the role of the cerebellum as an essential structure in dystonia pathophysiology.[4]

Another critical factor that plays a part in the dystonia pathophysiology and AM mechanism is peripheral sensory input abnormalities in sensorimotor integration. Patients with focal dystonia displayed a defect in the motor evoked potential inhibition after peripheral sensory stimulation.[5] This shows the direct correlation between peripheral sensory input and dystonic movements and helps explain why an external sensory stimulus may modulate the abnormal sensorimotor integration by overriding the dysfunctional background activation. This same abnormality has been tested with different neurophysiological tools, including somatosensory temporal discrimination, which is prolonged in patients with dystonia.[6] The correlation between AM and somatosensory temporal discrimination was explored. There is an optimal effect of AM in patients that could recognize lower thresholds of multimodal visual-tactile temporal discrimination.[7] Hence, patients tend to have a more effective AM when somatosensory temporal discrimination is more preserved. When looking at patients with facial dystonia, the presence of an AM was compared with normal prepulse inhibition of the blink reflex after the tactile stimulus, which generates a reduction in the motor output and consequently modulates the dystonic contraction. [7] However, other factors, primarily related to the external stimulus characteristic, may be important in the presence and effectiveness of AM. The case described in this manuscript points towards the importance of intrinsic characteristics of the sensory stimulus, such as the stimulus area.

AM in facial dystonia is a common feature, with prevalence ranging from 53 to 77 %.[8] The maneuvers vary significantly from touching the upper eyelid to a face massage, and the percentage of improvement ranges from 50 to 63%.[8] However, these maneuvers are often not enough to pertain a long-lasting benefit and may be

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uncomfortable when used constantly. In the case described, one of the main characteristics is the long benefit generated by face mask wearing. The continuous improvement is probably because a face mask is easily worn for hours without significant discomfort. The face mask purely sensory AM successfully improved the disability generated by facial dystonia, restoring functionality.

Interestingly, our patient had never reported any similar AM, even after living with dystonia for almost 30 years. We hypothesize that, in his case, the face mask generated sensory input in a wide area of the face, which is more likely to influence sensorimotor integration dysfunction. Supporting this hypothesis, the patient described different levels of improvement in the dystonic movement depending on the mask placement, being optimal when covering the nose and mouth and minimal when worn below the chin. Improvement of facial dystonia appears to be an unexpected, albeit rare, consequence of an essential COVID-19 preventive measure. To our knowledge, this case is the only one in the literature with a video demonstrating the striking improvement in facial dystonia while wearing a face mask and its particularities. Moreover, the difference in response to the AM effect depending on how the mask is placed on the face elicits the discussion on other mechanisms influencing dysfunctional sensory-motor integration. A large study looking into different AM in facial dystonia may determine if the area of the sensory tactile stimulus is directly correlated to the anti-dystonic effect.

Supplementary Material. To view supplementary material for this article, please visit https://doi.org/10.1017/cjn.2023.17.

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