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Sensorimotor Reactivity to COVID-19 Vaccination: A TMS Study on Vaccine Hesitancy

Saturday, September 13, 2025 2:10 PM (20 minutes)

Introduction. The Centers for Disease Control and Prevention recommends updated COVID-19 vaccines for the 2024-2025 season, highlighting the importance of vaccination to protect against severe illness and hospitalization. However, vaccine hesitancy remains a significant challenge, impacting the effectiveness of vaccination campaigns and contributing to ongoing infections and outbreaks.
Method. To provide new insights into the psychological mechanisms related to vaccine hesitancy/resistance, we tested the sensorimotor mapping of others'experiences of vaccination in individuals classified as hesitant or resistant to vaccination. We studied the amplitude of motor-evoked potentials in the deltoid, a relevant muscle for vaccine inoculation, during a computer-based presentation of pictures of individuals receiving the COVID-19 vaccine or other control conditions involving that muscle.
Results. We found a selective increase in the excitability of the deltoid motor cortex in highly vaccine-hesitant individuals compared to low-hesitant individuals when exposed to pictures depicting the inoculation of the COVID-19 vaccine, as opposed to the flu vaccine. Importantly, no difference was reported for the control muscle (extensor carpi radialis).
Discussion. These findings suggest that explicit scenes of COVID-19 vaccine injections trigger a somatotopically based facilitatory mechanism, possibly reflecting an automatic/anticipatory response of avoidance (i.e., a flight response) to the specific compound. A similar facilitation is elicited when viewing fearful/threatening pictures, indicating a potential relevance of this affective experience to explain the observed outcomes.

Keywords: COVID-19 anti-vaccination attitude; Motor evoked potentials; Deltoid; Pictures of COVID-19 vaccine injections;

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No

Primary author: MASSIMINO, SIMONA (Università di Messina)

Co-authors: Prof. MARTINO, Gabriella (Department of Clinical and Experimental Medicine, University of Messina, 98122 Messina, Italy); Prof. NUCERA, Sebastiano (Department of Cognitive, Psychological, Educational and Cultural Studies, University of Messina, Via Concezione, 6, 98121 Messina, Italy); Prof. AVENANTI, Alessio (Center for Studies and Research in Cognitive Neuroscience, Department of Psychology "Renzo Canestrari", Alma Mater Studiorum Università di Bologna, Cesena Campus, 47521 Cesena, Italy); VICARIO, Carmelo Mario

Presenter: MASSIMINO, SIMONA (Università di Messina)

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