

The Hidden Face of Fear in the COVID-19 Era: The Amygdala Hijack

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Coronavirus (2019-nCoV) pandemic has placed an overwhelming health and economic burden [1] and, most likely, has had a dramatic impact on emotional regulation. An Italian 32-year-old healthy right-handed woman, resident in Piacenza, Italy, one of the *red* areas, underwent a functional MRI with a visual task where happy faces and threat-related cues were shown. Images

of an intensive care unit correlated with a stronger activation of bilateral amygdala than did other tasks ($p < 0.05$, corrected) (Fig. 1). Indeed, when rating fear, the amygdala gives priority to 2019-nCoV in people subjected to the psychological consequences of the pandemic. When emotion takes over, the amygdala hijack occurs [2].

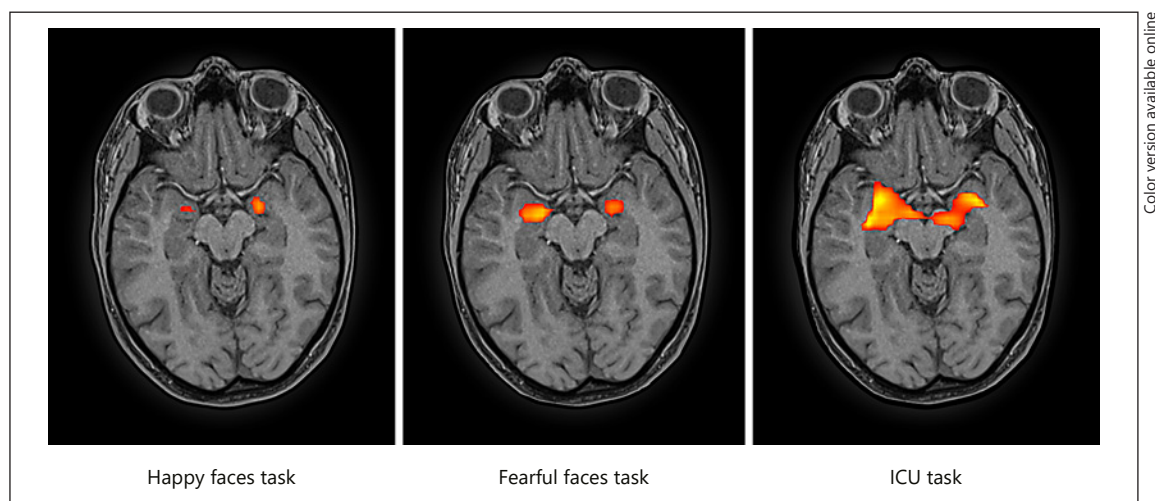


Fig. 1. Functional MRI. Tasks with happy faces and threat-related cues show a significant activation map (T-score 3–6) of the amygdalae, superimposed on a T1-weighted volumetric interpolated brain sequence. The ICU task involved images of intubated patients and healthcare personal with protective equipment, evoking the COVID-19 emergency and a stronger bilateral activation of the basolateral amygdala. ICU, intensive care unit.

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Statement of Ethics

Human and animal studies have been approved by the local Ethics Committee and, therefore, been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Specific national laws have been observed, too. The patient gave written informed consent for publication of the case, including brain MRI images.

Disclosure Statement

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References

- 1 Hick J, Biddinger P. Novel coronavirus and old lessons: preparing the health system for the pandemic. *N Engl J Med*. 2020 Mar 25. doi: 10.1056/NEJMp2005118. [Epub ahead of print].
- 2 Goleman, D. *Emotional intelligence: why it can matter more than IQ*. New York: Bantam Books; 1995.