

## I15 Could a Psychogenic Death Occur? The Scientific Analysis of a Mysterious Biochemical Process

Isabella Aquila, MD, PhD\*, Institute of Legal Medicine, Catanzaro 88100, ITALY; Carmen Scalise, MD\*, University of Catanzaro, Catanzaro, ITALY; Valerio R. Aquila\*, Crotone 88900, ITALY; Matteo A. Sacco, MD, Chair of Legal Medicine, University of Catanzaro, Catanzaro 88100, ITALY; Fabrizio Cordasco, MD\*, Università Magna Graecia CZ, Catanzaro, ITALY; Fiorella Caputo, MD, University of Catanzaro, Institute of Legal Medicine, Catanzaro 88100, ITALY; Francesco Sicilia, MD\*, University Magna Graecia of Catanzaro, Catanzaro 88100, ITALY; Luigi De Aloe, MD, Institute of Legal Medicine, Catanzaro 88100, ITALY; Pietrantonio Ricci, PhD\*, University of Catanzaro, Catanzaro, ITALY; Cristoforo Ricci, PhD, University of Catanzaro, Catanzaro, ITALY

**Learning Overview:** After attending this presentation, attendees will understand the significance of psychogenic death.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by analyzing the hypothesis of a dysfunction of the dopaminergic system as a cause of psychogenic death.

Several historical sources have been reported about mysterious cases of death not related to organic pathology. These cases have been called “give-up-itis,” described as cases of people who let themselves die. Historically, cases of prisoner soldiers in concentration camps during the various war conflicts that characterized the past century have been found. Other similar cases have been reported about survivors of shipwrecks or plane crashes.

Psychogenic death was not found only in such catastrophic events. In literature, there are many examples about hospitalized patients whose death was attributed to psychogenic death. In particular, in 1979, Stumpfe reported the case of a man who, the day after a surgical operation that he perceived to be unsuccessful, showed symptoms of regression, discharge, passivity, and apathy and died in a few hours.<sup>1</sup> Subsequently, an autopsy was performed with histopathological and toxicological analysis that showed no clear cause of death.<sup>1</sup> The most widely accepted etiopathogenetic theory concerns a dysfunction in the central nervous system. The nerve centers involved in this event appear to be the inter-neuronal circuits at the level of the frontal, prefrontal, and cingulate cortices and their interconnections with the basal ganglia. The neurotransmitter involved is dopamine. In particular, it seems that the etiology depends on a depletion of dopamine in the anterior cingulate circuit.

The dopaminergic system is essential in determining the response to an external stimulus and the associated emotions and behavior. It has been scientifically demonstrated for decades that people with low levels of dopamine tend to be apathetic, up to a real motor slowdown. The large part of psychiatric disorders are treated through a modulation of dopaminergic transmission and drugs such as clozapine are fundamental in reducing suicidal risk.<sup>2</sup> Some stages in psychogenic death have been identified. It all begins with a trauma that induces psychological withdrawal and apathy. Then there is a state of abulia up to psychic akinesia. The last phase is represented by death. From the literature review, it emerged that psychogenic death is not an acute event, but generally requires several days to occur and chronologically follows the steps described above. This event must not be associated with a common psychiatric illness such as depression. Some studies support the reversibility of this event. Scientific studies have shown that a psychotherapeutic and psychopharmacological approach can allow a recovery. The key element in understanding this disorder is subjectivity. In fact, not all the imprisoned soldiers or all the survivors from catastrophes manifest this syndrome. In these cases, a psychological substrate may coexist which favors its manifestation.<sup>3</sup>

Therefore, psychogenic death cannot be denied from a scientific point of view. Since this is a syndrome unrelated to organic alterations, an issue must be raised: the role of autopsy. In fact, it is based on a biomolecular process with no macroscopic manifestations, thus causing great problems for its diagnosis. From the forensic point of view, a thorough investigation about other causes and the exclusion of other probable and demonstrable causes of death is necessary, but above all, it is fundamentally necessary to analyze the clinical history of deceased subjects. In these cases, it is mandatory for the forensic pathologist to evaluate the personal history of the subject with possible presence of stressors such as to induce the degenerative biochemical cascade described to make diagnosis. At the same time, the entire international medical community must be updated about this issue since it is a reversible phenomenon through the increase, in the aforementioned neuronal circuits, of the levels of dopamine. It would be useful to create possible criteria that can also be used in the clinical and forensic field to prevent the event when it is in a reversible phase or to detect a postmortem diagnosis.

### Reference(s):

1. Stumpfe K.D. The psychogenic death of Mr. J. A case report. *Z Psychosom Med Psychother* 1979;25:263–73.
2. Keck P.E., Jr, Strakowski S.M., McElroy S.L. The efficacy of atypical antipsychotics in the treatment of depressive symptoms, hostility, and suicidality in patients with schizophrenia. *Journal of Clinical Psychiatry* 2000, 61 (3), 49).
3. “Give-up-it is” revisited: Neuropathology of extremis. *John Leach Extreme Environmental Medicine & Science Group*, Extreme Environments Laboratory, University of Portsmouth, Portsmouth PO1 2ER, England, United Kingdom).

### Forensic Science, Psychiatry, Death