




## CASE REPORT

# Simultaneous occurrence of a Takotsubo syndrome and paranoia delirium, related to Covid-19 pandemic: A case report

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## Abstract

Some psychosomatic diseases, like Tako-tsubo cardiomyopathy, may occur because of exposure to a stressful event like COVID-19. The simultaneous development of psychosis and Tako-tsubo cardiomyopathy suggests a field of vulnerability. Specific measures need to be taken to help vulnerable people to manage these stressful events.

## KEYWORDS

COVID-19, delusional disorder, psychosis, stress cardiomyopathy, Takotsubo

## 1 | INTRODUCTION

We report the case of a patient who develops, following psychological distress related to the COVID-19 pandemic, a paranoia delirium, and Tako-tsubo cardiomyopathy. This case suggests that the current global crisis is an extremely stressful situation that may cause psychotic episodes and psychosomatic symptoms; and impact the clinical expression of disorders. The COVID-19 pandemic is likely to result in a range of mental and physical challenges.<sup>1,2</sup> In addition to the various clinical manifestations of SARS-Cov2 infection, its financial and social impact as well as lifestyle changes have had a deleterious effect on individuals' physical and mental health.<sup>3</sup>

Patients with psychiatric symptoms, including depression and psychosis, may be predisposed to develop stress cardiomyopathy such as takotsubo syndrome (TTS).<sup>4</sup> TTS or broken heart syndrome is a poorly recognized heart disease in which the patient has a sudden onset, reversible

left ventricular systolic dysfunction. The incidence of TTS is around 1.7–2.2%.<sup>5</sup>

There have been case reports showing an association between the COVID-19 pandemic and stress cardiomyopathy.<sup>6</sup> However, it is rare to simultaneously develop psychosis and TTS triggered by psychological distress related to the current coronavirus pandemic.

We report the case of a 50-year-old patient who first develops delusional persecutory disorder commonly called "paranoia delirium" and TTS triggered by psychological distress related to the current coronavirus pandemic.

## 2 | CASE REPORT

A 59-year-old male patient was admitted against his will, to a psychiatric hospital for weird behavior and psychomotor agitation. His family reported a very recent history of impulsive and aggressive behavior.

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On biography, the patient was the third sibling of 9, with a high socioeconomic level. He was a brilliant student. Thanks to a graduate scholarship, he undertook studies in preparatory schools and engineering schools (arts and crafts). He worked as a stockbroker at a bank and then opened his own business. He is the father of 2 children. He is described as kind, generous, sensitive, psychoactive, intelligent and calm. However, he did not have many friends.

As for medical history, the patient had several coronary risk factors such as diabetes, hypertension, and dyslipidemia; he had an ischemic stroke in 2011, leading to a loss of vision. He has no personal history of psychiatric disease.

He was self-isolated to avoid the spread of the disease. He had financial problems due to the national lockdown.

He developed psychiatric symptoms 3 days before hospitalization; he stopped all treatment because he was convinced the drugs were harmful as part of a drug company conspiracy. He became sensitive and bad-tempered. On the day of his admission, the patient had an altercation with his neighbor. He accused his neighbor of spying on him and that he was the cause of his financial difficulties. He threatened to physically harm him.

He was summoned to the police station where he had an argument with police officers. They objectified a strange behavior, and the patient was transmitted to the psychiatric emergency.

Mental status examination revealed an orderly appearance, a normal temporal and spatial orientation, a clear conscience, a distant contact, and an irritable mood.

The discourse was expeditious conveying delusional ideas of reference and persecution, with the designated persecutor: his neighbor.

The mental examination also revealed traits of paranoid personality disorder such as unjustified feelings of suspicion and mistrust of others, hypersensitivity, expectation without justification, preoccupation with unjustified doubts about the loyalty and trustworthiness of friends.

Neurological examination and brain imaging were without abnormalities. Physical examination revealed: blood pressure 140/80 mmHg, heart rate 100 beats/min, oxygen saturation 99%, and temperature 37°C. A blood test was done, revealing a high glycemia and a disturbed lipid balance with high triglycerides and LDL.

The diagnosis retained was that of an acute exacerbation of delusional disorder persecutory type commonly referred to as "paranoia delirium", after eliminating organic causes like a subdural hematoma and hyperthyroidism as well as other psychiatric disorders such as a mood relapse of bipolar disorder.

He refused treatment and declared that he was on a wildcat strike: refusal of food, organic and psychiatric

treatment. The patient was put under anxiolytic injection: diazepam 10 mg to calm his agitation.

A few hours after his hospitalization, an electrocardiogram, being performed systematically as part of a pre-treatment entry assessment, showed elevated ST-segment in leads v3, v4, v5, and v6. The Troponin level was 3,000 ng/mL.

His echocardiogram revealed a reduced left ventricular ejection fraction which was 40%, There was also a decrease in the global longitudinal strain with a marked decrease in the apical segments, with no sign of myocardial inflammation. Emergency coronary angiography showed severe multivessel disease, tight stenosis in the posterior-right coronary artery. On the left, there were insignificant lesions in the mid and distal left anterior descending arteries, as well as insignificant lesions in the mid-circumflex and second obtuse marginal arteries.

Coronary angiography aspect, troponin kinetics, and clinical evolution were in favor of TTS. The patient was transferred to a cardiac intensive care unit. He was treated with kardegic 160 mg, clopidogrel 75 mg, atorvastatine 10 mg, cincor 2.5 mg and enoxapine 0.8 unit/ml. After 1 week, with the stabilization of clinical and electrocardiogram state, he returned to the psychiatric unit. Multidisciplinary care between cardiologist and psychiatrist was continued.

During his hospitalization in the ICCU, the patient considered his acute cardiomyopathy as a plot undertaken against him to oblige him to give up, to end protesting, and to stop the legal proceedings.

He was put under anxiolytic treatment: Lorazepam (2 mg/day). His psychiatric state improved significantly, showing an improvement of mood, less intrusive thoughts, and the development of initial insight.

This case report was revised to comply with recommendations of the Case Report guidelines, and an informed consent publication was obtained from the patient.

### 3 | DISCUSSION

This case, with a history of stroke, diabetes, and dyslipidemia, decompensated simultaneously a delirium of network persecution on a prior paranoid structure; and Takotsubo cardiomyopathy. These physical and psychiatric manifestations appeared following acute stress experienced during a period of confinement due to the Covid-19 pandemic. In fact, patients with cardiovascular risk factors may develop heart diseases preceded by emotional or physical triggers.

Takotsubo cardiomyopathy is transient cardiomyopathy that can be triggered by physical and/or psychological stressors. It is, among other things, explained by

the release of catecholamines,<sup>7,8</sup> and the high burden of stress-mediated neuropeptides from the limbic cortex into the myocardium,<sup>9</sup> leading to an increase in left ventricular volume with a decrease in the ejection fraction. The mortality rate from this pathology remains considerable.<sup>10</sup> According to Sandeep Singh et al., more than half of the patients who developed TTS had a history of cardiovascular diseases, hypertension, and/or diabetes.<sup>11</sup>

On the other hand, continuous exposure to stress has been also associated with mental disorders. In fact, mentally healthy individuals may develop symptoms of acute psychosis in the form of delirium following important stress.<sup>12</sup> Several articles report that the prevalence of anxiety and depressive disorders has significantly increased following the emergence of the pandemic. Researchers have shown the impact of the COVID-19 pandemic on delusional decompensations.<sup>11</sup> In fact, the lack of control, threatful thoughts, loneliness, and financial loss were found to be correlated with persecutory ideas.<sup>13,14</sup>

Delusional disorder persecutory type or also paranoia delirium is a chronic psychiatric disorder that can be triggered by environmental stressors. Noradrenergic and dopaminergic dysregulations at the level of the cerebral circuits have been objectified.<sup>15</sup>

Moreover, these factors are known to increase the risk of developing cardiovascular diseases.<sup>16</sup> A strong association between psychiatric comorbidities such as anxiety and the incidence of stress cardiomyopathy has been reported in the literature.<sup>17</sup> However, to our knowledge, this is the first case of the association of paranoia delirium and TTS in the context of the COVID-19 pandemic.

Our patient was exposed to a stressful situation that may have predisposed him to TTS as well as psychosis. An etiopathogenic link may explain the transient and the simultaneous appearance of these pathologies (release of catecholamines, noradrenergic dysregulation, etc.). We can also hypothesize that a patient's body may react to a psychological threat as if it is a physiological one.

## 4 | CONCLUSION

Exposure to a stressful event like COVID-19 may lead to the development of both physical and psychiatric symptoms. This simultaneous decompensation, which is a rare event, suggests a field of vulnerability and a common physiopathology to these two pathologies.

Exploring factor predictors of developing physical and psychotic symptoms in the context of the Covid-19 pandemic may be of crucial importance to define vulnerable patients.

Specific measures and psychiatric care need to be present to help vulnerable people to manage these stressful events and reduce the risk of psychosis and cardiac diseases.

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## CONFLICTS OF INTEREST

All authors declare that they have no conflicts of interest to disclose.

## AUTHOR CONTRIBUTIONS

HBA and EB: conceived the ideas and led the writing. LB, GH, AB and EK: involved in writing. LM: did the editing.

## ETHICAL APPROVAL

An informed consent publication was obtained from the patient and his family.

## CONSENT

Published with written consent of the patient.

## DATA AVAILABILITY STATEMENT

Data available on request from authors

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