

Simultaneous occurrence of transient global amnesia and takotsubo syndrome triggered by caring for a terminally ill relative

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November 18, 2023

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Case Report

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Keywords: Takotsubo syndrome; transient global amnesia; emotional stressor; hypothyroidism; migraine.

Statements

- funding statement – no funding, no grants
- conflict of interest disclosure – no conflict of interest (both authors)
- ethics approval statement – n. a.
- patient consent statement – in written form available
- permission to reproduce material from other sources – n. a.
- clinical trial registration – n. a.

Introduction

Transient global amnesia (TGA) is characterized by a sudden, complete inability to retain new information, lasting for several hours, with preservation of alertness and all other cognitive functions. During a TGA episode, anterograde amnesia occurs characteristically, with an inability to retain new information for more than a few seconds, and retrograde amnesia extends backward for several hours, days, or longer.[1] Takotsubo syndrome (TTS) is characterized by acute transient left ventricular systolic dysfunction, not explained by coronary artery disease, which has to be distinguished from acute myocardial infarction.[2] Emotional and

physical stressors play a role as triggers for TGA and TTS, and coincidence of both conditions has been reported (Table). [3][4][5][6][7][8][9][10][11][12][13][14] In a cross-sectional study of US hospitalizations, from 2006 to 2014, there were 155,105 diagnoses of TTS. TTS was associated with TGA with an odds ratio of 2.3 (95% confidence interval 1.5-3.6). [15] In most cases, the trigger lasted only for a short period of time (Table). We report a case of simultaneous TGA and TTS triggered by a long-term stressful condition.

Case report

A 67-year-old female in general good health, BMI 26.4, with a history of hyperlipidemia, migraines, and hypothyroidism started to suffer from headache during training at the gym with light weights - 10 lb, 12 lb. - for arms, chest and legs. She felt nauseous and called her husband. When he came to the gym, he asked her if she was well enough to drive. She said yes, but couldn't remember where she parked the car. Her husband was concerned because she kept repeating herself, saying that she did not feel good. She did not remember anything that happened for the next 8 hours. She did not remember that her sister had died 3 months ago and did not know what day or month or even year it was. The husband took her to the hospital because he suspected myocardial infarction or stroke.

During the 18 months before this event, she was taking care of her sister who suffered from ovarian cancer. She was with her 3-4 times a week until the last 8 weeks, when she was there each day. She was also with her when she died. Afterwards she got the sister's estate settled, sold the home, and helped her daughters through all of this.

She was on a chronic medication with bupropion 200 mg/d, levothyroxine 75 µg/d, rosuvastatin 5 mg/d, butalbital 50 mg/d, acetaminophen 325 mg/d and caffeine 40 mg/d.

In the emergency department her heart rate was 89/min, respiratory rate 20/min, blood pressure 206/107 mmHg and O2 saturation 98 %. Laboratory tests showed an initially elevated high-sensitivity troponin of 138 ng/L, which increased to 1344 ng/ml (normal range: 0 - 54 ng/L).

Computed tomography (CT) of the head showed no acute intracranial abnormality, CT angiography of head and neck showed no hemodynamically significant stenosis, aneurysm, dilatation, or dissection within the intracranial or extracranial arterial circulation. Magnetic resonance imaging (MRI) of the brain showed no acute infarct.

She underwent cardiac catheterization with no evidence of coronary artery disease. The left ventricular ejection fraction (LVEF) was 50%, and anterolateral wall hypokinesia was seen. Cardiac MRI showed a normal left ventricular cavity size and global systolic function with a LVEF of 57%, and a mild hypokinesia involving the basal to mid anterior wall. Additionally, faint edema and mild mid myocardial/epicardial delayed enhancement involving the basal to mid anterior and septal segments was seen, but there was no evidence of myocardial infarction. Right ventricular cavity size and systolic function were normal.

Clinical investigation 20 hours after onset of symptoms found her seated on the bed, awake and alert. She had no complaints, denied symptoms of headache and vision changes. The memory was back to normal. She denied symptoms of tingling, numbness, palpitations, weakness, dizziness, or lightheadedness and walked with steady gait. Metoprolol 25 mg/d was added to her medication. She was discharged after three days. Before, during and after hospital admission she never felt anginal chest pain. Because of low blood pressure, her cardiologist reduced metoprolol to 12 mg/d. After discharge from the hospital, she started grief counseling and is doing much better mentally and physically. Four weeks after discharge, the echocardiogram did not show any wall motion abnormalities.

Discussion

The pathogenic mechanisms behind TTS and TGA remain unsolved, but a catecholamine surge may be part of the underlying pathophysiology. [1][15] Based on several pathophysiologic findings, it has been suggested that TGA might be a "cerebral Takotsubo". [16]

The presented patient suffered from two comorbidities which are known to be associated with TTS as well as TGA, migraine and hypothyroidism. Migraine has been identified as a risk factor for TTS as well as TGA.[1][15][17] Hypothyroidism is more frequent in patients with TTS as well as TGA than in the general population.[17][18][19] The pathomechanism of hypothyroidism as well as migraine in these disorders, however, is unclear.

The coincidence of TGA and TTS associated with a long-lasting stressor has, to our knowledge, only described in one case.[12] (Table) Of note, similar to our patient, the reported female suffered from hypothyroidism.

The comedication of our patient may possibly have contributed to the development of TTS. TTS has been reported after ingestion of a weight management supplement containing caffeine and amphetamine-like stimulants.[20] In a further case, TTS occurred after a combined drug intoxication containing acetaminophen.[21]

We conclude that TTS and TGA can occur simultaneously even after long-standing stressors. Probably, hypothyroidism and migraine make the patient more susceptible to TTS and TGA.

Author Contributions

Claudia Stöllberger - collection of clinical data, literature research, drafting of the manuscript, corresponding author

Josef Finsterer – literature research, drafting of the manuscript

Key Clinical Message

Takotsubo syndrome and transient global amnesia can occur simultaneously even after long-standing stressors. Probably, hypothyroidism and migraine make the patient more susceptible to both of these disorders.

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Table: Type and duration of triggers in patients with TTS and TGA (included were only reports which described the triggering event)

Author	Year of Publication	Age/sex	Trigger	Duration of t
Stöllberger [3]	2010	77/f	Assault	Few hours
Grautoff [4]	2012	69/f	Health problems of the daughter	24 hours
Bobinger [5]	2013	62/f	Visit to a public swimming pool	Few hours
Toussi [6]	2014	66/f	Witnessing sister's death	Immediately
Quick [7]	2015	57/f	Son died in a car accident	2 weeks
Sajeev [8]	2017	60/f	Anniversary of the death of a loved one	Few hours
Stöllberger [9]	2018	57/f	Existential fear	1 week
Pyle [10]	2018	59/f	Anxiety attack	Few hours
Finsterer [11]	2019	64/m	Funeral of brother	Few hours
Tso [12]	2019	62/f	Death of a family member, recent family court case	One year
Papadis [13]	2022	75/f	Job meeting	Immediately
Dziewierz [14]	2023	64/f	Acute emotional stress event	Few hours