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Posttraumatic Cardiovascular Reaction After Triple Post Office Robbery. A Most Unusual Case

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People who have experienced traumatic stress show an increased incidence and prevalence of cardiovascular diseases, such as coronary heart disease and thromboembolic stroke. Risk factors like hypertension, hyperlipidemia, and obesity are also more likely to occur [1]. This may partly account for the higher number of cardiovascular events in individuals with PTSD but a change in neurohormonal pathways plays a role as well [1].

A dysregulation of cortical arousal and neurohormonal abnormalities with an increased activity of the sympathoadrenal axis following exposure to traumatic stress have been reported [2]. Plasma norepinephrine and 24-hour urine norepinephrine levels have been shown to be elevated [3]. Patients with PTSD also show a reduced heart rate variability and higher basal heart rates as signs of increased sympathetic activity [1]. Increased blood pressure at rest and an increase in blood pressure and heart rate as a response to stimuli relating to the trauma or even loud sounds can be observed [1]. Additionally, the effects of catecholamines on the heart, vasculature, and platelet function seem to play a role [4, 5]. Changes in immune function with elevated levels of inflammatory mediators including interleukin-6, tumor necrosis factor, and C-reactive protein as seen in some patients with PTSD have also been reported to stimulate atherosclerosis [6].

Background

PTSD (posttraumatic stress disorder) may arise after severe traumata such as a motor vehicle crash, sexual assault, or combat experience and is a common psychiatric disorder [7]. These traumatic situations involve death, threat on one's life, serious injury, or the loss of physical integrity, resulting in a response of intense fear, helplessness, or horror [8].

PTSD is characterized by intrusive recollections of the event, avoidant/numbing symptoms, and hyper-arousal symptoms [8]. Stressors that remind the patient of the trauma can cause a sense of reliving the experience which often results in avoidant behaviour and social isolation. Hyper-vigilance and hyper-arousal result in increased resting heart rate, increased startle reaction, as well as an increased heart rate and blood pressure as responses to loud sounds or stressors remindful of the trauma [4]. At night, patients commonly suffer from nightmares [8].

Effective, evidence-based treatments are available for persons with PTSD including group or individual psychotherapy (for example, cognitive-behavioural therapy) and pharmacotherapy, particularly antidepressants such as selective serotonin reuptake inhibitors (SSRI) [9].

Commonly, persons with PTSD are diagnosed with a comorbid mental health problem such as depression, another anxiety disorder, substance abuse, or others [9, 10]. Cardiovascular risk factors such as hypertension occur more frequently in this population as compared to persons with PTSD only [10].

Case Report

Hypertension in PTSD After Triple Post Office Robbery

The female patient worked at the post office of an Austrian town for many years. In 2000, this office was robbed for the first time. The second assault happened only 3 months later. The patient was threatened with a gun and experienced immense fear. She developed typical symptoms of PTSD, such as increased arousal caused by loud sounds and sudden movements, hyper-vigilance, nightmares, and reliving of the traumatic experience (eg, triggered by men in hoods or doors opening abruptly). Sweating, trembling, tachycardia, and palpitations indicated an increased sympathetic activity. Due to the lack of knowledge about her condition she declined psychotherapy offered by the company as well as the use of any psychotropic drugs. The third robbery occurred 8 years later, whereupon the patient dissociated and was admitted to hospital. After this event, she was incapable of working and moved to the countryside. Rehabilitation and specific trauma therapy were initiated. In 2011, she was admitted to hospital with a hypertensive crisis. She had never been diagnosed with hypertension before but examination with echocardiography showed hypertensive cardiomyopathy, indicating a long-term impact. Additionally, blood lipids were elevated. Ergometry showed signs of ischemia in the ECG and cardiac catheter examination was performed. It was negative for coronary heart disease but showed signs of atherosclerosis.

Antihypertensive and antihyperlipidemic medication, lifestyle modification with exercise training as well as psychotherapy and treatment with SSRIs were recommended to reduce sympathetic stress and symptoms of PTSD as well as cardiovascular risk factors.

Discussion

Not all persons experiencing traumatic stress develop PTSD. Resilience and other psychosocial resources are associated with a decreased likelihood of PTSD [11].

Previous studies as well as this case report suggest examining traumatic experiences in a structured cardiologic anamnesis as these patients suffer from altered cardiovascular conditions. On the other hand, the detection of cardiovascular risk factors in persons being treated for PTSD may support early diagnosis and treatment.

Various models of pathophysiology causing the psychological and physical comorbidity in persons with PTSD have been explored [12]. Biological functions such as increased activity of the hypothalamic pituitary adrenal axis, heightened noradrenergic function, and changes in immune function as well as psychological comorbidities like depression, anxiety disorder, and substance abuse disorder have been taken into account.

These findings are important for cardiologic practice and research as changes in the cardiovascular system develop over

time and first-line prevention in patients with PTSD could be improved. Adequate therapy may be offered early to prevent major cardiovascular events.

Therapy includes specific evidence-based treatment for PTSD as well as the reduction of cardiovascular risk factors.

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