

Post-traumatic stress disorder among patients waiting for cardiac surgery

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Summary

Aims: The goal of the study was a preliminary assessment of the occurrence of post-traumatic stress disorder (PTSD) among patients awaiting major heart surgery and the assessment of the reliability of the Impact of Event Scale – Revised (IES-R). The study was inspired by publications indicating a high rate of PTSD among cardiac patients.

Methods: In total, 100 consecutive patients scheduled for non-emergency cardiac surgery were screened using a brief list of PTSD symptoms. Those who responded affirmatively were further assessed with the IES-R, the structured Mini-International Neuropsychiatric Interview (M.I.N.I.) and a clinical assessment according to the DSM-5 criteria.

Results: Out of the 15 patients who completed the IES-R, in 14 a possibility of PTSD was noted. Five refused to undergo a psychiatric examination, and of the remaining 9 patients, 4 met PTSD criteria according to M.I.N.I. and DSM-5. One case of PTSD was related to cardiac problems.

Discussion: The results of the present study do not support the hypothesis that heart disease is a stressor causing PTSD in patients awaiting cardiac surgery. Moreover, the study calls into question conclusions suggesting high rates of PTSD among some populations of cardiac patients in research conducted with self-rating scales. It demonstrates that clinical psychiatric examination is necessary to properly confirm a PTSD diagnosis.

Conclusions: The prevalence of PTSD in the study group (4%) was higher than in the general population in Poland, but the heart disease-related stressor was found only in one case (1%), a rate equal to the rate of PTSD. The reliability of IES-R is low due to a large number of false positives.

anxiety, cardiac patients, depression, Impact of Event Scale-Revised, post-traumatic stress disorder

INTRODUCTION

Identification of all stressors that can cause post-traumatic stress disorder (PTSD) is a challenge for modern psychiatry. A significant number of reports have indicated a more frequent incidence of PTSD among patients with cardiac disease when compared with the general population. Twenty-five studies on PTSD associated

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with heart disease were included in a literature review and the frequency of the disorder presented ranged from 0 to 38% [1].

It is known that a major surgery, such as cardiac surgery, can cause long-term consequences, which may be perceived by patients as life threatening, and cause devastating physical and psychological stress [2]. Most of the publications reviewed were based on self-report rating scales and did not contain evidence that the traumatic factors were directly connected with heart disease. For instance, a high level of PTSD incidence (23% vs. 9% in the control group) was obtained by Bayer-Topilsky et al. [3] in a study of patients with mitral regurgitation based on the PTSD Checklist – Civilian Version (PCL-C), a self-rating questionnaire. In a relatively small number of studies a standardized method of diagnosis was next used, for instance a structured interview conducted by trained researchers. One such study [4] compared an observed prevalence of PTSD among patients with heart disease and cancer, using multiple methods to determine PTSD: the Post-Traumatic Stress Scale 10 (PTSS-10), Impact of Event Scale-Revised (IES-R) and the Structured Clinical Interview for DSM-IV (SCID). The following results were obtained for each scale: 29.2%, 7.6% and 4.8%, indicating poor compatibility between the methods [4].

The observed discrepancy might be due to the limited usefulness of self-report questionnaires, which are sensitive to various biases. Vassend and Skrondal [5] noticed a relationship between current distress levels, medical condition and somatic complaints reported by patients in self-report questionnaires. On the other hand, some researchers using interview-based standards for PTSD diagnosis indicated a meaningful relationship between cardiac diseases and PTSD. One of the most complex follow-up studies, by Vaccarino et al. [6], aimed to determine a connection between PTSD and coronary heart disease (CHD). The Diagnostic Interview Schedule based on DSM-III-R was used to identify PTSD, and the myocardial perfusion by ammonia positron emission tomography was applied to assess cardiac outputs. Results indicated a risk of CHD that was two times higher in patients with a diagnosis of PTSD in a follow-up over 13 years. Additionally, the authors showed that patients with PTSD had a more compromised myocar-

dial perfusion and lower coronary flow reserve, providing evidence of a correlation between PTSD and cardiac symptoms [6].

The presence of PTSD in the general population over a period of 12 months is estimated at 1.1% [7]. However, data from reliable epidemiological studies indicate significant differences across different countries. For instance, lifetime prevalence in Poland is 1.1% [8], whereas in the United States it stands at 6.8% [9].

Taking into account the weaknesses of self-report questionnaires and the unquestionable importance of screening for PTSD in cardiac patients, our aim was to assess the reliability of the IES-R at the preliminary assessment of PTSD occurrence in this group of patients.

OBJECTIVES

- The validity of the IES-R was evaluated by comparing the results of the scale indicating PTSD risk with a diagnosis made in accordance with the Mini-International Neuropsychiatric Interview 5.0 (M.I.N.I. 5.0), supported by an evaluation conducted by a trained doctor (during a psychiatric major) using the DSM-5 criteria.
- Determining the stressors causing PTSD symptoms and recurring as intrusive memories (flashbacks) using a Structured Interview Identifying Traumatic Events in PTSD (a tool created for the purpose of this study).
- Preliminary evaluation of the prevalence of PTSD among patients awaiting major/substantial cardiac surgery. [end of list]

MATERIALS AND METHODS

Sample

The study included 100 consecutive patients, 57 men (57%) and 43 (43%) women, aged 18–86 years ($M = 63.2 \pm 11.2$), awaiting non-emergency cardiac surgery at the Valvular Heart Disease Department of the Institute of Cardiology in Warsaw. Clinically unstable patients, and those requiring intensive care therapy and/

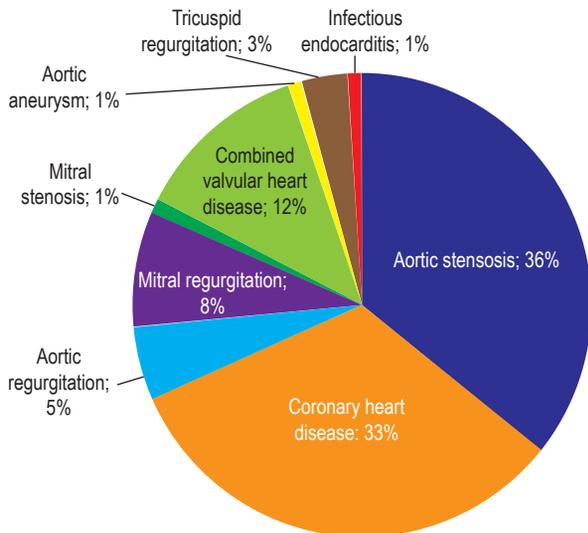


Figure 1. The distribution of primary indications for non-emergency cardiac surgery in the studied cohort.

or emergency/lifesaving surgery were excluded from screening. All patients accepted an invitation to participate in the study. The majority were symptomatic in New York Heart Association (NYHA) classes II (49%) and III (39%); 8% were in NYHA class I and 4% in NYHA class IV. Fourteen patients were enrolled on an urgent list for surgery, while the remaining 86 were considered non-urgent. The primary diagnosis is presented in Figure 1.

The study complied with the Declaration of Helsinki and the research protocol was approved by the Institutional Ethics Committee of the Institute of Cardiology. Patients gave consent to participate in the study. At a later stage, five patients refused to undergo a psychiatric interview and withdrew their consent.

METHODS

Demographic data were collected from an official demographic survey and clinical data were derived from patients' clinical records.

All patients were asked to fill in an inventory consisting of three screening questions that were based on PTSD criteria in the M.I.N.I. 5.0 [10]. Respondents who gave affirmative answers to at least one of the questions underwent the Structured Interview Identifying Traumatic Events in PTSD, which was used to evaluate traumatic events recurring as intrusive memories (flashbacks) causing PTSD. This tool was

created for the purpose of the study and included detailed questions about the situation which could be the cause of traumatic stress, e.g. "What did you do in the stressful situation?" or "When did the first unwanted memories/images about the stressful situation appear, and for how long?" Patients who disclosed a traumatic event in the Interview were asked to fill in the IES-R, a self-rating questionnaire.

The Polish version of IES-R was developed by Juczyński and Ogińska-Bulik [11], based on the original scale by Weiss and Marmar [12]. The questionnaire consists of 22 questions and 3 five-point subscales (with scores between 0 and 4: 0 – not at all, 1 – a little bit, 2 – moderately, 3 – quite a bit, 4 – extremely) corresponding to the intensity of such symptoms of PTSD as intrusion (8 items), hyperarousal (7 items) and avoidance (7 items). The total possible score ranges between 0 and 88 points. In the original questionnaire a high rate of internal cohesion of the individual scales was observed: intrusion $\alpha=0.91$ (0.87), avoidance $\alpha=0.84$ (0.85) and hyperarousal $\alpha=0.90$ (0.79); this was observed in two independent studies. The instrument's stability, investigated in both studies with the test-retest reliability method, was as follows for individual scales: intrusion $\alpha=0.59$ (0.94), avoidance $\alpha=0.51$ (0.89), hyperarousal $\alpha=0.59$ (0.92). These data show a satisfactory level of the instrument's stability [11]. In the Polish version of IES-R, the threshold value for the presence of PTSD was determined as a mean score (total score on the subscale divided by the number of its items) of 1.5 or more points on each of the subscales. The threshold was adopted from the work of Creamer, Bell and Fairla [13]. The authors report that this cut-off score is characterized by a diagnostic sensitivity at $\alpha=0.91$ and specificity at $\alpha=0.82$, with a positive predictive value of 0.90. The best diagnostic accuracy was obtained at the total cut-off score of 33 points.

Patients whose results were measured by the IES-R underwent a full M.I.N.I. examination conducted by a trained psychiatrist. The M.I.N.I., in its officially available Polish version 5.0.0 [14], was developed as a brief structured interview for the diagnosis of mental disorders based on the DSM-III-R and ICD-10 criteria. It can be used by clinicians after a brief training session, but non-professionals require more intensive training. The psychometric properties of the origi-

nal English-language version of M.I.N.I. were assessed on the basis of the Composite International Diagnostic Interview (CIDI) [15]. There are no data on the psychometric characteristics of the Polish version of the instrument. The structured interview allows discussing possible symptoms and therefore similar attributes of the Polish version of the M.I.N.I. can be expected. In order to meet the latest clinical recommendations, a final diagnosis of PTSD was additionally verified based on the DSM-5 diagnostic criteria [16].

Results

In all, 71 patients answered affirmatively to at least one of the three screening questions (42 to 2 and 9 to all three). Only 15 reported experiencing an extremely stressful event and symptoms related to it, such as flashbacks and/or somatic complaints in Structured Interview Identifying Traumatic Events in PTSD. All of those patients were screened with the IES-R. The total mean score in this group was 51.8 (SD=21.22). Mean scores in the subscales were as follows: intrusions subscale 2.36 (SD=1.09); hyperarousal subscale 2.32 (SD=1.22); avoidance subscale 2.38 (SD = 0.95). Out of the 15 patients, 14 obtained a result indicating a possibility of PTSD (14% of the entire group) based on the IES-R scales. Their total score was 33 or higher and the mean score was above 1.5 in all subscales. A psychiatric consultation was recommended to all 15 patients who reported a traumatic event when answering the screening question that constituted the criteria for being included to the study. Among those, 1 person did not obtain the IES-R result indicating PTSD; this person, along with 4 others, refused to undergo a psychiatric evaluation.

In the psychiatric examination using the M.I.N.I. 5.0 and DSM-5, PTSD criteria were met by 4 out of 9 patients with the IES-R scores suggesting PTSD. Six patients (4% of the entire group, thus 44% of patients who had the IES-R scores suggesting PTSD) did not meet the criteria for PTSD in the psychiatric examination and 5 patients refused a psychiatric examination. Only in the case of one female patient aged 74 was PTSD directly related to a cardiac surgery, which was identified as an actual trigger of PTSD. According to M.I.N.I., three patients with

PTSD did not have any comorbid disorder and one had a major depressive disorder.

Among the five patients whose IES-R scores indicated the risk of PTSD but for whom the diagnosis was not confirmed by M.I.N.I., two did not have any mental disorders; one had a major depressive disorder; one had a major depressive disorder and alcohol use disorder; and two had a coexisting major depressive disorder, generalized anxiety disorder and agoraphobia.

DISCUSSION

The results of the present study do not support the hypothesis that heart disease is a stressor commonly causing PTSD in patients awaiting cardiac surgery.

In a recent work, Deng et al. [17], who aimed at evaluating the prevalence of PTSD within a group of patients with adult congenital heart disease, used two self-reported scales to assess this prevalence: the IES-R and the PTSD Checklist – Civilian Version. Within a group of 127 patients, 14 (11%) met the criteria of PTSD symptoms based on the IES-R. Importantly, authors suggested that the PTSD symptoms were specifically related to the cardiac disease diagnosis. Despite the fact that our study group did not include patients with a diagnosis of adult congenital heart disease, such a high percentage of PTSD symptoms related specifically to a cardiac diagnosis stands in opposition to our data, which showed that among 4 cases with confirmed PTSD, only 1 was related to a cardiac disease. Such discrepancy may be due to a lack of psychiatric examination in the work of Deng et al. [17], where PTSD symptoms were examined based only on self-reported scales and the traumatic event was identified only through a background survey. A similar percent of PTSD symptoms, among a group of 1,125 patients scheduled for cardiac surgery requiring a cardiopulmonary bypass, was reported by Kok et al. [18]. Authors showed that PTSD symptoms were present in 10.2% of the group, based on a self-report inventory for PTSD (SRIP) containing 22 items. Kok et al. [18] did not include information about the cause of PTSD symptoms and patients were not evaluated by a psychiatrist to confirm PTSD based on any disease classification. In our work,

PTSD frequency was also significantly lower than in the group of American patients with mitral regurgitation (4% vs. 23%) [3].

In a paper by Einsle et al. [4], diagnostic criteria for PTSD as assessed with the Post-Traumatic Stress Scale 10 (PTSS-10), IES-R and a structured interview were met by, respectively, 29.2%, 7.6% and 4.8% of cardiac and neurological patients [4]. Tarsitani et al. [19] assessed the frequency of PTSD in patients who had undergone cardiac surgery at 19.7%. The incidence of PTSD adversely affected the patients' quality of life after cardiac surgery in a mid-term observation [20].

Our study demonstrated a large discrepancy between the results of the IES-R and PTSD diagnosis according to the MINI 5.0 and DSM-5 diagnostic criteria. A discriminant function analysis of IES-R by Beck et al. [21] showed that, based on all three subscales of the IES-R, it was possible to correctly classify 69.2% of the sample, with sensitivity of 74.5 and specificity of 63.1. A high percentage of false positives obtained by the IES-R in this work indicates a limited usefulness of this instrument for clinical practice. Because of the heterogeneity of the studied population, contributing to a possibility of many comorbidities related to cardiovascular diseases, more work is needed to examine how somatic symptoms related to a cardiac diagnosis can influence a high percentage of false positive ratings.

Our literature review indicates that PTSD increases the risk for early incident of cardiovascular disease and cardiovascular mortality by over 50% and incident hypertension risk by over 30% [22]. Therefore, it seems necessary to identify PTSD symptoms among cardiac patients at the earliest possible stage. Our work demonstrated that psychiatric examination might be necessary to properly confirm the PTSD diagnosis and to recognize whether heart disease is indeed the cause of the disorder or the cause of PTSD symptoms, and thus it should become routine in medical care units. A high rate of patients who refused to participate in a psychiatric examination may indicate social distrust towards psychiatrists and stigmatization of a mental disorder diagnosis.

Some limitations of the study are due to fact that patients with different diagnoses and different applied procedures were included into the study group.

CONCLUSIONS

The IES-R is not a reliable instrument for PTSD screening among patients awaiting cardiac surgery due to 40% of false positive scores. A total of three cases diagnosed in a clinical psychiatric examination were not related to the stressor caused by cardiological conditions. In one case, a cardiac surgery procedure was identified as a trigger for PTSD symptoms. The significant rate of diagnosed mental disorders (including PTSD) in the study group may indicate a need for psychiatric care for patients awaiting major heart surgery.

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