

The Importance of Psychological Assessment and Support in Patients Suffering from Cardiovascular Disease or Undergoing Cardiac Treatment

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Abstract

Psychosocial factors play an undoubtedly important role in the development of cardiovascular diseases and can also highly affect efficacy and outcome of cardiac treatment or the success of rehabilitation. These factors are proven to have a major role in patient evaluation in two ways: (1) risk factors are important in establishing prognosis and/or as (2) indicators of need for further specific psychological interventions.

According to the literature available: depression, severe anxiety and other psychosocial characteristics are considered to be risk factors. These factors include low socio-economic status, chronic family or work related stress, social isolation or lack of support, negative emotions, affective dysregulation and also negative personality patterns or hostility. Identifying and examining these factors have great importance in multidisciplinary patient care. It is important to highlight the chances of adverse outcome and provide clinical solutions since many of the risk factors are treatable psychological conditions.

Keywords: Psychosocial Risk; Cardiovascular Disorder; Adverse Outcome; Psychological Intervention

Introduction

There is a growing field of knowledge supporting the fact that psychological factors can affect the development and the continuity of chronic diseases such as chronic lower back pain (CLBP) and cardiovascular diseases (CVD) [1-6]. Some of these "cardio toxins" have direct effect on physical functions and some have indirect influence on lifestyle behaviors leading to unhealthy habits (Table 1) [6-8].

The most significant psychosocial factors are depression, anxiety, stress, anger and social isolation [8-20]. Individual and combined psychosocial factors show connection with the coronary artery disease, the onset of heart attack, the length of post-heart attack hospitalization and post-heart attack survival [4,22-25].

The presences of psychosocial risks have an impact not only on the development but also on the chances of recovery and of mortality after a cardiac event. It is associated with the occurrence of adverse outcome in patients with established coronary artery disease [26]. Thus psychological assessment of the cardiac patient can play an important role in treatment planning, providing confirmation in medical decision-making and helps to predict the indication for treatment modalities and long-term outcomes of medical treatments.

Possible physiological pathways

Psychological distress affects the neurohormonal regulation promoting chronic changes in physical functioning (Table 1) [6-8].

The stress-response is characterized by release of catecholamines and corticosteroids, increased heart rate, autonomic cardiac functioning, and blood pressure, also changes in processes relevant to clotting processes, such as coronary vasoconstriction, platelet aggregation, or plaque rupture. Stress induced autonomic nervous system activation might also lead to the occurrence (or reoccurrence) of cardiac event by arteriosclerosis or the dysfunction of cells in the coronary artery lining, or by directly triggering arrhythmias through alterations of neural transmission [27].

Acute stress (laboratory induced or traumatic life-event)	Increased sympathetic nervous system functioning and hypothalamic pituitary adrenal axis activity, increased blood pressure, heart rate and hypertension, heightened interleukin 6 level
Chronic stress (work stress, marital strain, life adversity, etc)	Increased sympathetic nervous system functioning and hypothalamic pituitary adrenal axis activity, increased ambulatory blood pressure, heart rate, inflammation and hypertension
Mood state (depression, anxiety, etc)	Increased inflammation, platelet functioning, autonomic nervous system dysregulation, hypothalamic pituitary adrenal axis dysregulation

Table 1: Effects of psychosocial factors and health behaviors on cardiovascular functioning

There are great differences in how the same level of stress exposure can affect the individual physiological functioning. For example the same chronic stressors can lead to sustained hypertension in some individuals but not in others. This phenomenon can be explained by genetic predisposition, personality and coping style as well as

environmental differences affecting the adaptation to certain distresses [28].

The focus of psychological interventions

There is a wide range of psychosocial risk factors that can be taken into consideration during the assessment of cardiac patients. The three main areas of psychological issues associated with CVD are: (A) Evaluating cardiac patients and identifying the existing risk factors; (B) Facilitating health promoting behavioral changes and adherence to medical treatment; (C) Interventions to treat psychological risk factors that influence the onset and progression of CVDs [29-32].

Conceptualizing psychosocial risk

There seems to be from strong to moderate evidence supporting the importance of psychological factors, but certain doubts about the role of psychosocial risk still exist concerning the scientific validity and clinical relevance of these findings [33]. The uncertainty arises from methodological inconsistencies, and from the definition, measurement and interpretation of various psychosocial measures (negative effects, depression, stress, anger etc.) [34]. Different studies may also use different psychometric tools for the measurement of psychosocial risk factors [35]. For instance the scope of one depression scale can highly differ from another psychometric tool, providing different results leading to contradiction in literature [32]. It is advised to use well-validated self-report questionnaires and structured interviews as well to assess psychosocial characteristics and well-validated cutoff scores and diagnostic criteria to define affecting factors [36].

Depression

Research evidence shows that the chronic depressive mood has a significant role in the progression of a heart disease. It has both behavioral and pathophysiological pathways as well [9,37]. The pathophysiological effects include a change in the cortisol hormone level, neuroendocrine and endothelial dysfunction, disturbance in autonomic cardiac functioning, inflammation and enhanced platelet functioning [6,8,15,36]. Depression can also be linked to poor health behavior such as smoking, obesity, poor compliance and adherence [6,37]. It also effects the participation in cardiac rehabilitation such as intention to participate and future dropouts from program and its outcome [38].

Depression is also a strong predictor for adverse short- and long-term clinical outcomes in patients with CVD [6,10,39]. A recent systematic literature review (analyzing 52 individual studies and 4 meta-analyses) showed strong connection between depression and adverse clinical outcomes [36].

According to Nakamura and colleagues depression can be the strongest independent risk factor for CVD related adverse outcomes including arrhythmias, angina, prolonged disability, re-hospitalization and increased mortality [38]. Studies suggest that somatic-affective, but not cognitive factors of depressive symptoms are responsible for the increased risk [40,41].

According to prospective epidemiological studies hopelessness as an aspect of depression can even double the risk of CAD. Also this specific symptom has been linked to sudden death both in observational studies and animal models [Table 2] [6].

Somatic depression symptoms of	Body image change
	Work difficulty
	Insomnia
	Fatigability
	Loss of appetite
	Weight loss
	Somatic preoccupation
	Loss of libido

Table 2: Somatic symptoms of depression

Anxiety

There are several ways in which anxiety affects heart health and plays a role in the progression of CVDs. On one hand it can be linked to ventricular arrhythmias, and on the other hand research supports the connection with reduced heart rate variability [42]. Anxiety is also connected to negative lifestyle behaviors such as poor dietary habits, smoking etc., but the causal relationship is hard to establish between psychological and behavioral factors [43].

In a longitudinal research 180 patients undergoing cardiac surgery were followed for ten years. Anxiety, depression and the number and reason for re-hospitalizations were assessed yearly. Research results shows that preoperative anxiety increases the risk for long-term mortality after cardiac surgery especially in patients with low education status and social support [44,45].

Psychological distress

Stress is one of the most commonly mentioned factors that contribute to poor cardiovascular health, although there are several aspects of this phenomenon [15].

It is believed that chronic stressors (work related, environmental and subacute accumulated life stress) have direct impact on the physiological stress response system and it is also associated with poor lifestyle behaviors that contribute to coronary artery disease [46,47]. The factors provoking stress response are highly diverse from socioeconomic status, marital conflict, job dissatisfaction and insecurity, gender discrimination, life-altering event to psychiatric disorders [48]. There are several studies showing that psychological distress can contribute to increased risk of death due to cardiovascular disease [49,50].

Aggression and hostility

It is one of the earliest and most controversial risk factor which emerged from the Type A personality concept associated with poor health [6,51]. According to Davidson and Mostofsky, we can distinguish between beneficial and detrimental types of anger in terms of adverse outcome, but self-report assessment tools are inappropriate for differentiation. Lately research evidence is supporting that only the hostile component of anger is truly harmful to cardiovascular health, moreover moderate anger expression can be a protective factor against future CVD events [4].

From a behavioral aspect this kind of affective state can be associated with problematic lifestyle behaviors such as poor diet, obesity, and alcoholism, smoking and social isolation [52].

Social bonds

The lack of social support is also an associated risk factor for CVD. The phenomenon is poorly conceptualized, which causes a great interference among study results. It can be examined from different points of views, since it is about more than the physical presence of people. Social deprivation effects the neuroendocrine regulation by the changes caused in the body's stress response [6,15].

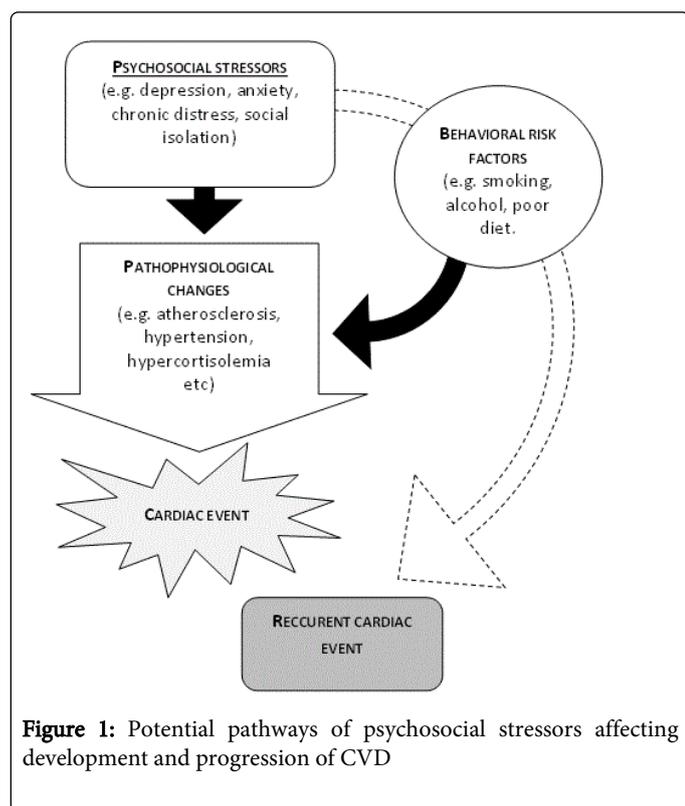


Figure 1: Potential pathways of psychosocial stressors affecting development and progression of CVD

Not only does it contribute to the development of specific diseases but can highly affect survival rates after cardiac events. The absence of social bonds and relationships has been found a three times greater risk for mortality in three years period after heart attack [53,54]. Many aspects of social isolation, like the perceived quality of social network, feeling of loneliness and the physical absence of others can have a negative effect on cardiovascular health [6,18-20]. These factors can contribute to the development and progression of coronary disease and to the raised chances of having a second MI and poor recovery after cardiac event [55].

Distress induced by the CVD does not only affect the patient, but his/her social connections as well. The degree of depression or anxiety for the partner is at least as great as the distress of the patient, thus the disease have an overall effect on social relationships [56].

Psychological assessment and interventions before cardiac surgery

Because of the previously shown risk factors psychological screening can be extremely useful not only in primary prevention, but

also in predicting the risk of prolonged hospitalization or other adverse short- or long-term outcomes. Evaluation, psychoeducation and psychological support may reduce adverse effects leading to a more efficient treatment and more cost-effective care [57].

One author addresses the timing of psychometric testing, because general distress caused by the cardiac event or by hospitalization can distort the results. Nakamura and colleagues propose that psychological screening can be most useful at discharge, because lasting distress or psychiatric condition is more stable than during other periods of hospital stay. Also, evidence exists emphasizing the efficacy of multidisciplinary cardiovascular rehabilitation where psychological interventions play an important role [58]. Some findings suggest that the patient and his/her partner should be conceptualized as a "dyadic unit" and therefore both of them should be involved in psychological care [56].

Most of the psychosocial risk factors are treatable psychological conditions [1]. Thus psychological interventions can be used to prevent adverse outcomes. According to a systematic review psychological interventions for cardiac patients have the potential to improve health-related quality of life, anxiety, blood pressure, knowledge and satisfaction with care [56]. These interventions can even result in improved quality of life and also improved mortality [59,60].

If needed, pharmacological treatment can be taken into consideration, which can be effective in reducing the somatic/affective symptoms of depression in order to increase the potential to affect the cardiac prognosis [41]. However some medications have adverse cardiovascular effects. Tricyclic agents and monoamine oxidase inhibitors should be used more cautiously in patients with CAD, also some of the selective serotonin reuptake inhibitors (SSRIs) may interact with certain cardiovascular drugs [61]. Still, SSRIs are the most commonly used products according to their safety profile regarding the cardiovascular system [41,62]. It is important that the beneficial effects of SSRIs appear only after 2 weeks' time on average, thus they won't ease the depressive symptoms in the preoperative period. In some cases it may be desirable to postpone surgery until depression responds to treatment, if the patient's medical condition is stable enough [57].

Conclusion

In many areas psychology has found its unique role integrating its knowledge and practice into conventional medicine. Nowadays psychological factors are considered as strong and independent risk factors for chronic disease, but usually are not recognized in the clinical practice [26]. There are existing models for psychological patient assessment in spinal care, and for implantable devices [1,63-65]. In the field of cardiology however, evidence is controversial regarding the role of psychological interventions. Components of disease etiology are closely related, thus independent risk factors are hard to investigate. Distress experienced by the cardiac event or before the surgery leads to distorted measures of psychological variables. From a methodological perspective multifactorial psychosocial correlates of long-term outcomes should be examined weeks after the cardiac event. Personalized psychological interventions are problematic to compare to individual etiological constructs.

For better clinical relevance psychosocial, behavioral and medical risk factors can be assigned a point value based on the strength of the

research relevance, thus all the risk ratings could be administered in a clinical algorithm.

Clinical practice should be tending towards multidisciplinary care models and recognize the evidence of the benefits of comprehensive patient care. It can result in a decrease of adverse outcomes, decrease of treatment expenses, improvements in quality of life and in decrease of disability [26,58,66].

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