Review Article

Depression, Anxiety and Cardiac Surgery in the Indian scenario: a review

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ABSTRACT

Up to 15 percent of patients with cardiovascular disease and up to 20 percent of patients who have undergone coronary artery bypass graft (CABG) surgery experience major depression. For more than two decades, the prognostic influence of depression on cardiac surgery is unavoidable. Cardiac surgery may provide a suitable exemplar to better understanding of psychological mechanism of cardio-pathogenesis. It is surprise considering that some pathophysiological mechanisms through which depression is hypothesized to affect coronary heart disease exhibit a paucity of research till date .Addressing the depressed patient has traditionally not been a priority in the management of cardiac surgical patients despite the fact that a disproportionate number of patients in the cardiac surgery population suffer from depression. Naturally, the rates of depression after cardiac surgery highlight a requirement for appropriate identification, support, and intervention efforts. Collaboration between psychologists and psychiatrist specialists with cardiac surgeons, cardiologists, and cardiac nurses may enhance the research basis for improved patient outcomes. It is commonly hoped that intervention might mitigate the deleterious impact of depression on subsequent morbidity and mortality.

Key words: depression, anxiety, cardiac surgery, cardiology, behavioural cardiology.

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INTRODUCTION

The mind-body link has always fascinated medical man as ultimate acknowledgment of good treatment will eventually be appreciated by the mind and not the body. Major depression is predictive of developing cardiac disease and of adverse outcomes among patients with existing cardiac disease and surgery [1-4]. The current paper explores the mutual impact of major depression and cardiac surgery have on each other. It is common for a cardiac patient to feel sad after cardiac surgery or procedure, recent hospitalization, or new diagnosis of heart disease. These emotions may be the result of not knowing what to expect or not being able to do simple tasks. These temporary feelings of sadness are normal, and should gradually go away, when such common sadness, fear and hopelessness persist and transforms into anxiety, depression creates a bizarre situation and events to follow. When depressed mood is severe and accompanied by other symptoms that persist every day pre-operatively and post-operatively and continues even after discharge for 2 or more weeks, treatment becomes mandatory to cope and recover.

Coronary artery bypass graft (CABG) surgery leads to a 25% incidence of major depression and up to a 75% incidence of adjustment disorder with depressed mood. Screening patients for depression during the preoperative work-up may reap benefits for the patient with regard to the smoothness of the postoperative recovery [5-8]. The scientific field of cardiac psychology, also known as behavioral cardiology and

psychocardiology, began long back on 1959 when Friedman and Rosenman, two cardiologists, invented the *'type A behavior pattern (TABP)'*, the two major symptoms of which are easily aroused anger (free floating hostility) and time pressure (doing too much in too little time).World Health Organization (WHO) describes health as a state of complete physical, mental, and social well-being and not merely an absence of disease or infirmity. Conceptually Cardiac psychology or Behavioral Cardiology is a newly emerging concept high-lighting the need for psychology intervention in patients suffering from cardiac diseases [8-11]. Although the psychological side effects of cardiac surgery have long been of interest, the prevalence and influence of depression and anxiety on patients undergoing cardiac surgery lag behind the evidence documented in heart failure, myocardial infarction, and acute coronary syndromes. Rather, in cardiac surgery, an emphasis has been placed on preserving cognitive function but not mental health function [11-14].

A PubMed search of the terms *"psychosocial factors and cardiovascular disease"* now yields more than 52,000 citations. Research links depression, social isolation, anxiety, anger, as well as a number of less researched psychosocial factors, with both the onset and poor treatment outcome of coronary heart disease (CHD). A meta-analysis of 893,500 initially healthy subjects reported that depression is a risk factor for both MI and CHD [15], while another meta-analysis with 317,540 subjects determined that depression is a risk factor for non-fatal and fatal stroke [16]. In 2014, an expert panel convened by the American Heart Association recommended that depression be elevated to risk factor status for patients with acute coronary syndrome (ACS) [17]. Anxiety has been associated with increased risk of cardiovascular mortality of CHD, stroke, and heart failure in a meta-analysis with 2,017,276 subjects [17]

CABG: INDIAN SCENARIO

High levels of evidence suggest significant benefits with respect to morbidity and mortality in addition to cost savings. However, behavior cardiology is grossly underutilized and has not received the attention it deserves in India [18-19]. This underutilization is due to the various barriers that exist with respect to awareness and understanding of the benefits health-care professionals, referrals, limited presence of specialized professionals, and a lack of awareness among patients on the benefits of behavior modifications and mind wellness. Majority of patients remain undiagnosed and those who are diagnosed have limited means of specialized care. But booming of medical tourism have paved a path for many tertiary care super-specialty hospitals cater to complete healthcare who exclusively visit India for medical reasons [20]. This has now changed the scenario for Indian patients as well. Many such hospitals offer medical package for a particular amount and the macro- and microeconomics determine the kind of medical care that will eventually be rendered to the patients [21]. Another finding is that majority of Indian patients also have many modifiable risk factors like high stress levels, smoking, hypertension, obesity, and diabetes [21-22] and non -modifiable risk factors such as age and gender. Such information opens a window of opportunity for collaborative intervention for long-term gains.

CABG AND PSYCHOPATHOLOGY

The range of complications ranges vary depend upon the vascular involvement. The deep involvement of Psychological, sociological and environmental factors which act as influencers of anxiety, depression, neurocognitive deficits, delirium, and cerebrovascular accident becomes inevitable [23]. For more than 15 years, WHO has been sounding an alarm on the rapidly rising burden of cardiovascular disorders. The incidence and prevalence in Indian population may be higher because of sociodemographic reasons [24]. During the early stages, management of CAD includes dietary and life style modification, lipid lowering agents, blood pressure monitoring, glycemic control, and antiplatelet agents. As the disease progresses, these measures are not sufficient to maintain a satisfactory quality of life. Over the years, refinement of surgical and anesthetic procedures has led to significant reduction in mortality and morbidity [10]. However, still a significant number of patients do have associated psychological morbidity which is disabling and distressing. Relationship of psychological symptoms with coronary heart disease has been well known since a long time [11]. It is important to note that psychological illness when co-morbid with

cardiac illness generally leads to poorer outcomes [20-25]. Depression has been found to be an independent prognostic factor for mortality, readmission, cardiac events, and lack of functional benefits 6 months to 5 years after CABG [13–16]. These observations highlight the need for integrating psychosocial interventions to provide holistic and effective management after CABG. Studies using self-report depression measures suggest up to 50% of patients experience depressive symptoms [9, 11–13]. Studies using self-report measures do not reflect a clinical diagnosis of depression but, rather, depression symptoms.

CONCEPT OF DEPRESSION AND ANXIETY

According to the International Classification for Diseases tenth edition (ICD-10), depression is characterized by low mood and/or anhedonia (loss of interest in activities that once were pleasurable) that lasts for two weeks or more and is accompanied by significant functional impairment and somatic complaints of disturbed sleep, fatigue, body aches, digestive or sexual problems, and negative thoughts. Depression and coronary artery disease are highly comorbid conditions with estimates of comorbidity from 14% to 47% [26-27]. Though both depression and CAD may share same etiopathogenesis, they both need to be diagnosed and treated independently [28]. It is like a patient suffering abdominal trauma and fractured femur following an accident. Both conditions need attention for complete recovery. Preoperative depression is predictive of decreased cardiac symptom relief, quicker return of symptoms, more frequent rehospitalizations, and increased mortality in the immediate postoperative period [29]. Postoperative depression too is associated with delayed wound healing, higher infection rate, poor physical and emotional health, reduced pain threshold, and more adverse cardiac events like myocardial infarction and early death [30-32]. All these factors lead to poor overall quality of life and rising health costs. Depression is considered to be a risk factor for the development of CHD and deteriorates the outcome after cardiac rehabilitation efforts [33-36].

Anxiety on the other hand refers to feeling of apprehension and unease. Anxiety has somatic, physiological, and cognitive components. Somatic component refers to digital tremors, palpitations, and sweaty palms. The physiological component refers to tachycardia, hyperventilation, muscular tension, and an irritable bladder. The cognitive component is that of worry which refers to undue fear of something untoward happening [18]. Pathological anxiety manifests as a feeling of impending doom, excessive worrying thoughts of being disabled, persistent palpitations, generalized muscular tension with inability to relax, breathlessness, hyper vigilance, persistent headache, frequent urge to pass urine, butterflies in stomach, and persistent sleep disturbance. Frequently, such symptoms are either ignored or not asked/reported. However, they cause significant distress and may lead to adverse outcomes. It has been found to be unusually high for CABG patients while on the waiting list with an unknown surgery date [30]. Fear of dying before rather than during surgery has been highlighted as a pervasive and anxious preoccupation [18]. Following CABG, anxiety precipitates cardiac decompensation owing to higher autonomic arousal thus delaying healing and recovery. The most common anxiety disorders appear to be generalized anxiety disorder (GAD) and panic Disorder with prevalence ranging from 0-11%. Other anxiety disorders are phobias (2.5–4.3%), obsessive compulsive disorder (0.6–9%) and posttraumatic stress disorder (PTSD) (4–11%) [18].

It is not uncommon to find both depression and anxiety to coexist on a continuum so much so that they are considered together as both impair one's quality of life and interfere significantly with the ability to think rationally. Researchers have tried to pinpoint the etiological basis of depression in cardiac illnesses and have implicated factors like hypercortisolemia, insulin resistance and sympathetic- parasympathetic tone dysregulation, reduced heart rate variability, hypothalamic-pituitary-adrenal axis (HPA) axis, and increased inflammatory factors like platelet factor 4, fibrinogen, and C-reactive protein. Unhealthy lifestyle like cigarette smoking, excessive alcohol intake, lack of physical exercise, poor medications adherence, and unhealthy diet may also be directly or indirectly contributing to the onset and progression of depression [20–22]. Recent publications have indicated that routine screening of depression should be introduced as standard practice in the preoperative assessment of patients undergoing cardiac procedures [3, 5-7].

MULTI SUPER-SPECIALTY INTERFACE: CARDIOLOGY, NEUROLOGY & PSYCHIATRY

The interface between heart and the mind is too strong to be neglected. For reasoning to exist, a fine balance between the mind and the heart is needed for rational decision- making. When we speak of the mind, we refer to the software of the hardware that we call brain. The reliability and the functionality of this software (mind) are based on prime functioning of the underlying hardware (brain). Any insult to the structural integrity of the brain often gets translated into cognitive, emotional, motor, or sensory symptoms [17]. The purpose of this review study is to highlight the role of early identification and management of emotional disorders that are encountered while caring for the patients undergoing CABG.

MANIFESTATIONS OF DEPRESSION AND ANXIETY IN INDIAN SUBJECTS

Fatigue, loss of appetite, psychomotor retardation, insomnia, and difficulty concentrating can be the direct physiological response to a medical illness and hospitalization [20] and have been documented to significantly increase in the first month after CABG surgery [21]. Important risk factors associated with a major depression episode among patients undergoing CABG surgery include female gender, younger age, a previous depression episode, and evidence of a family history of depression [8]. Patients at high risk might warrant closer monitoring during the perioperative period with respect to depression and related psychiatric sequel such as delirium, as described subsequently.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

The interaction between depression pathophysiology and effects of cardiopulmonary bypass is a potentially fruitful avenue of research in cardiac surgery to better understand mechanisms of psychiatric cardio-pathogenesis. Coronary artery disease is the most important cause of morbidity and mortality in Indian subcontinent. There have been rapid advances in the care of those suffering its effects. Strong biological link between emotional state and coronary artery disease is well established. It may be prudent to screen the patients during routine workup before and after surgery. Many patients may not be able to describe their symptoms in busy outpatient set-up. Under such conditions, patient education and awareness may be a useful strategy. Collaboration between psychologists and psychiatrist specialists with cardiac surgeons, cardiologists, and cardiac nurses may enhance the research basis for improved patient outcomes. Depression is prevalent in approximately one-third of patients undergoing cardiac surgery at the time of discharge. Preoperatively depressed patients tend to have an improvement in depression scores, whereas other patients have worsening of depressive symptoms. Future studies are necessary to develop effective, timely treatment strategies for the different subgroups of depressed patients before and after cardiac surgery

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