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Anxiety and post-traumatic stress disorder in cardiac patients

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Key Points

- Approximately 50% of cardiac patients may have symptoms of anxiety and 25% have anxiety disorders
- Anxiety can affect the development of heart disease, further morbidity, healthcare use and possibly rehabilitation
- Post-traumatic stress disorder (PTSD) is an anxiety disorder and occurs in approximately 15% of people after sudden cardiac events such as myocardial infarction or cardiac arrest. A further 18% may have subclinical symptoms of PTSD
- PTSD symptoms are associated in a dose-response manner to cardiac morbidity and mortality, even after taking into account usual cardiac risk factors
- Cardiac care therefore should include screening and management of anxiety and PTSD.

Introduction

Although regarded as a psychological condition, anxiety has a strong physiological component through activation of the sympathetic branch of the autonomic nervous system. Anxiety can be accompanied by symptoms such as a racing heart, palpitations and breathlessness. Due to the similarity between anxiety symptoms and cardiac problems, anxiety is a common concern for cardiac patients. Approximately 50% of cardiac patients report symptoms of anxiety after acute cardiac events and approximately 25% have anxiety disorders (Crowe et al, 1996; Januzzi et al, 2000). These statistics are significant as anxiety is thought to play a role in heart disease in a number of ways, including -

- The development of heart disease
- Further morbidity and prognosis
- Health-care use and attendance
- Ability to modify lifestyle and engage in rehabilitation.

The link between anxiety and the development of heart disease is now well established. A systematic review of prospective studies of healthy samples concluded that anxious people are between 2.4 and 7.8 times more likely to develop heart disease (Suls and Bunde, 2005). Evidence for the effect of anxiety on prognosis in patients with existing heart disease is less consistent; the same review concluded that the majority of research finds no relationship between anxiety and mortality in cardiac patients (Suls and Bunde, 2005). However, anxiety might affect further morbidity. Research suggests anxious patients are one to five times more likely to experience nonfatal myocardial infarction (MI), new onset or recurrent ischaemia, ventricular tachycardia, congestive heart failure and unstable angina (Frasure-Smith et al, 1995; Moser and Dracup, 1996; Denollet and Brutsaert, 2000). The effect of anxiety on cardiac morbidity appears to be independent of depression (Huffman et al, 2008).

Anxiety is associated with a focus on threat-related stimuli. In people with heart disease, anxiety may lead to an increased focus on cardiac and other physical symptoms, prompting increased healthcare use. For example, Karsdorp et al (2009) found that when people were given false information about irregular heart beat, anxious patients were more likely to interpret this as a symptom of cardiac problems than non-anxious patients or healthy controls. Anxious patients are also more likely to experience non-cardiac chest pain (White et al, 2010). Other evidence supports the influence of anxiety and depression on health service use, but the direction of this effect is not clear or necessarily consistent. For example, some studies have shown that anxiety and depression in cardiac patients predict poor attendance at rehabilitation and increased hospital readmissions (Tully et al, 2008; Deskur-Śmielecka et al, 2009). However, this latter finding may be partly due to increased morbidity, rather than psychological distress per se. Similarly, anxiety and depression may have different effects on service use. For example, one study found that length of stay in hospital after coronary artery bypass graft surgery was longer in patients with depression but shorter in those with PTSD symptoms (Oxlad et al, 2006).

In terms of the impact on rehabilitation and ability to make appropriate lifestyle changes, there is some evidence that anxiety is associated with poor adherence to dietary advice and other aspects of rehabilitation (Kuhl et al, 2009; Luyster et al, 2009). A study of anxiety in 278 MI patients found that anxiety was associated with less change in socializing, smoking cessation or stress management four months after MI, even after controlling for demographic, cardiovascular and other psychological variables (Kuhl et al, 2009). However further research in this area is required as the evidence is inconsistent and most research in this area has looked more generally at anxiety and depression combined.

Post-traumatic stress disorder and heart disease

The majority of research into anxiety and heart disease has focused on symptoms of anxiety, as measured by self report questionnaires, rather than classifying the presence of anxiety disorders. While this approach has merit, consideration of the full range of anxiety disorders may bring to light presentations and clusters of symptoms that otherwise go undetected in heart disease. Anxiety disorders include generalized anxiety disorder, panic, phobias, obsessive-compulsive disorder and posttraumatic stress disorder (PTSD). Of these, there has been increasing interest in the occurrence of PTSD following cardiac events (Owen et al, 2001; Spindler and Pedersen, 2005; Ginzberg, 2006). PTSD is an anxiety disorder that occurs when people experience a life-threatening event during which they feel intense fear or helplessness. Diagnostic criteria for PTSD are shown in Table 1.

Like other anxiety disorders, PTSD is a risk factor for the development of heart disease and other illnesses. Epidemiological studies of war veterans show those with PTSD report more circulatory, digestive, nervous, respiratory and musculoskeletal diseases (Boscarino, 1997), and are at greater risk of cardiovascular disease, cancer and all-cause mortality (Boscarino, 2006). PTSD symptoms appear to have a dose-response effect on cardiovascular disease. In other words, it is not necessary for a person to reach diagnostic criteria for PTSD - even low and moderate symptoms increase risk of heart disease (see Kubzansky and Koenen (2009) for an overview). For example, a prospective study found that women with five or more symptoms of PTSD were three times more likely to develop heart disease, even after controlling for risk factors such as diabetes, smoking, hypertension, anxiety and depression (Kubzansky et al, 2009).

In cardiac patients, PTSD is most likely to occur after severe events with sudden onset, such as MI or cardiac arrest. PTSD may also be related to the traumatizing nature of some medical treatments, such as resuscitation. For example, patients in intensive care units report a variety of psychological consequences such as confusion, fragmented recall of events, nightmares and hallucinations, which can increase vulnerability to PTSD (Jones et al, 2001). Reviews of PTSD following MI report prevalence rates of up to 22%, with an average prevalence of around 15% (Spindler and Pedersen, 2005; Gander and von Känel, 2006). Up to another 18% of people may experience subclinical levels of PTSD symptoms (Ayers et al, 2009).

Research into PTSD after a range of health events shows there is very little association between severity of injury or disease and PTSD (Tedstone and Tarrier, 2003). This also appears to be the case after MI, where PTSD is best predicted by factors such as perceived severity of MI, feelings of helplessness, fear of dying, and young age (Rocha et al, 2008; Guler et al, 2009; Wiedemar et al, 2009).

Many people who have PTSD symptoms immediately after an MI will recover without treatment. Studies of PTSD in other populations have shown that up to half of people with symptoms immediately after the event recover without intervention in the first three months. A study of rape victims found that although 94% met symptom criteria for PTSD 2 weeks after rape this decreased to 47% 3 months after the assault (Rothbaum and Foa, 1993). The same has been found in longitudinal studies of PTSD in medical populations such as women after pregnancy loss or stillbirth (Englehard et al, 2001; Turton et al, 2001).

The coping strategies used by individuals following trauma is thought to be critical in determining whether PTSD symptoms resolve (Ehlers and Clark, 2000). This is demonstrated in MI patients. Ayers et al (2009) found the strongest predictors of PTSD symptoms after MI were if the patient had a history of psychological problems, believed the MI had negative consequences (e.g. problems in relationships or dealing with medication and self-care) and used dysfunctional coping techniques (e.g. trying to numb emotions, distract themselves from upsetting thoughts). These factors were more strongly associated with PTSD than perceived severity of the MI.

If PTSD does not resolve, symptoms may have a significant impact on the psychological and physical wellbeing of MI patients. PTSD is associated with impaired social functioning, poor physical health (Ginzburg et al, 2003), increased psychological distress, depression, anxiety, somatic complaints (Ginzburg, 2006; Chung et al, 2008), and decreased quality of life (Cohen et al, 2009). Approximately half of people who develop PTSD after MI may also develop depression (Ginzburg, 2006). There is some evidence that the combination of both anxiety and depression leads to an even poorer prognosis for patients with heart disease (Doering et al, 2010).

Less research has looked at the effect of PTSD on prognosis. The few studies that are available suggest PTSD is associated with increased reports of cardiovascular symptoms, physical limitations, readmission and mortality (Shemesh et al, 2004; Ladwig et al, 2008; Cohen et al, 2009) but not necessarily with differences in measurable physiological parameters such as left ventricular ejection fraction (LVEF) (Ladwig et al, 2008). For example, a study of more than 1000 people with heart disease found physical limitations and self-reported cardiovascular health were more strongly predicted by PTSD than by physical measures of cardiovascular health such as LVEF or inducible ischaemia (Cohen et al, 2009). A long-term follow up of patients with implanted cardioverter-defibrillators showed that patients with PTSD were 3.5 times more likely to die over 5 years, even after controlling for age, sex, diabetes, medication, LVEF, depression and anxiety (Ladwig et al, 2008).

Clinical implications

The potential impact of anxiety and PTSD suggests a number of important implications for the screening and management of cardiac patients, both in cardiac services and primary care.

Screening

Identifying patients who may benefit from psychological intervention is a key task for healthcare professionals involved in care of cardiac patients (Janeway, 2009). National Institute for Health and Clinical Excellence (NICE) guidelines (Cooper et al, 2007), the British Heart Foundation (National Audit of Cardiac Rehabilitation team, 2009), and the Department of Health's National Service Framework (NSF) (DH, 2000) all emphasize the need to identify potential psychological consequences of heart disease, such as anxiety and depression. Indeed, the NSF outlines that patients should be offered an assessment of their physical, psychological and social needs for cardiac rehabilitation, before discharge from hospital.

Various self-report instruments are available to screen for anxiety (Janeway, 2009) that are a practical and cost effective. For example, a screening tool for psychological distress (STOP-D) has been designed specifically for use in cardiology settings (Young et al, 2007). This is a brief 5-item measure where patients rate their levels of depression, anxiety, stress, anger and support. Healthcare professionals can administer such screening tools and when patients' scores indicate high levels of anxiety or other distress, this can be followed up with a discussion with the patient on the exact nature of his/her symptoms.

It is unlikely to be helpful to screen all patients for PTSD or to use PTSD-specific measures. Notable PTSD symptoms include distressing dreams, intrusive recollections of the cardiac event and/or its treatment, feeling as if the event is reoccurring and distress when reminded of the event. Healthcare professionals may need to ask about the occurrence of such symptoms if patients report high levels of anxiety on self-report questionnaire or in general discussion.

Management

In mild-to-moderate cases of anxiety, including PTSD, information giving and reassurance about the symptoms experienced can be helpful, especially in the early stages after a cardiac event. If patients are able to understand and normalize their symptoms they are less likely to ruminate about the meaning of their symptoms and use dysfunctional coping strategies, both of which are associated with the development and maintenance of anxiety symptoms.

Cardiac rehabilitation (CR) is recommended for patients following MI and is widely recognized as resulting in decreased morbidity and mortality (Eshah and Bond, 2009). Information about coping with anxiety can be, and often is, incorporated into CR sessions. In addition cardiac rehabilitation

sessions can provide advice regarding lifestyle changes and social support. However, uptake of CR is often poor (National Audit of Cardiac Rehabilitation team, 2009). Health professionals are well placed to raise awareness of the benefits of CR and promote attendance.

Partners of patients who have suffered an MI often experience feelings of distress (Joeke et al, 2005). There are no data on how PTSD in cardiac patients affects partners, although it is reasonable to assume this may be an additional source of tension for partners/carers. This may be significant as perceived social support has been shown to be a factor in the development of PTSD symptoms (Bisson, 2007).

Onward referral

When anxiety symptoms persist and are significantly affecting an individual, further support is required. The recommended treatment for many anxiety disorders—including PTSD—is psychological therapy. Cognitive behaviour therapy (CBT) or eye movement desensitization reprocessing (EMDR) are recommended by the NICE guidelines (National Collaborating Centre for Mental Health, 2005) as effective forms of intervention for PTSD.

For moderate symptoms of anxiety or PTSD it may be feasible to treat people in primary care and GPs can refer to an appropriate local service. Severe symptoms of anxiety or PTSD require referral to adult mental health services or specialist PTSD services. However, it should be emphasized that patients who are distressed by a cardiac event may find it difficult to engage with mental health services due to concerns about stigma. In addition mental health services may not be best placed to support cardiac patients with their concerns. It is often helpful for cardiac services to make links with psychologists and psychiatrists who are experienced with both mental health and physical health difficulties.

Conclusions

In conclusion, research clearly shows that anxiety symptoms, including PTSD, are a risk factor for the development of heart disease and are associated with further morbidity in cardiac patients. Screening and treatment for anxiety is therefore critical in cardiac settings and primary care. The information available so far, as outlined in this article, suggests that appropriate management of anxiety, including PTSD, should lead to increased quality of life and reduced morbidity or mortality for these patients. However, this has yet to be evaluated or confirmed by research.

References

- American Psychiatric Association (1994) *Diagnostic and Statistical Manual for Mental Disorders*. 4th edn. American Psychiatric Press Inc, Washington DC
- Ayers S, Copland C, Dunmore E (2009) A preliminary study of negative appraisals and dysfunctional coping strategies associated with posttraumatic stress disorder symptoms following myocardial infarction. *Br J Health Psychol* 14(3): 459–71
- Bisson JI (2007) Post-traumatic stress Disorder. *Br Medical Journal* 334: 789-793
- Boscarino JA (1997) Diseases among men 20 years after exposure to severe stress: implications for clinical research and medical care. *Psychosom Med* 59: 605–14
- Boscarino JA (2006) Posttraumatic stress disorder and mortality among US Army veterans 30 years after military service. *Ann Epidemiol* 16: 248–58
- Chung MC, Berger Z, Rudd H (2008) Coping with posttraumatic stress disorder and comorbidity after myocardial infarction. *Compr Psychiatry* 49: 55–64
- Cohen BE, Marmar CR, Neylan TC, Schiller NB, Ali S, Whooley MA (2009) Posttraumatic stress disorder and health-related quality of life in patients with coronary heart disease: Findings from the heart and soul study. *Arch Gen Psychiatry* 66: 1214–20
- Cooper A, Skinner J, Nherera L et al for National Collaborating Centre for Primary Care (2007) *Post Myocardial Infarction. Secondary prevention in primary and secondary care for patients following a myocardial infarction* [Full version of NICE clinical guideline 48]. <http://guidance.nice.org.uk/CG48> (accessed 23 February 2010)
- Crowe JM, Runions J, Ebbesen LS, Oldridge NB, Streiner DL (1996) Anxiety and depression after myocardial infarction. *Heart Lung* 25: 98–107
- Denollet J, Vaes J, Brutsaert DL (2000) Inadequate response to treatment in coronary heart disease: Adverse effects of Type D personality and younger age on 5-year prognosis and quality of life. *Circulation* 102: 630–5
- Department of Health (2000) *National Service Framework for Coronary Heart Disease: Modern Standards and Service Models*. March <http://tinyurl.com/yuomhl> (accessed 23 February 2010)
- Deskur-Śmielecka E, Borowicz-Bieńkowska S, Brychcy A, Wilk M, Przywarska I, Dylewicz P (2009) Why patients after acute coronary syndromes do not participate in an early outpatient rehabilitation programme? *Kardiol Pol* 67: 632–8
- Doering LV, Moser DK, Riegel B et al (2010) Persistent comorbid symptoms of depression and anxiety predict mortality in heart disease. *Int J Cardiol* 145 (2): 188-192
- Ehlers A, Clark, D (2000) A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38: 319-345
- Engelhard IM, van den Hout MA, Arntz A (2001) Posttraumatic stress disorder after pregnancy loss. *Gen Hosp Psychiatry* 23(2): 62–6
- Eshah NF, Bond AE (2009) Cardiac rehabilitation programme for coronary heart disease patients: An integrative literature review. *Int J Nurs Pract* 15: 131–9
- Frasure-Smith N, Lespérance F, Talajic M (1995) The impact of negative emotions on prognosis following myocardial infarction: Is it more than just depression? *Health Psychol* 14: 388–98

- Gander ML, von Känel R (2006) Myocardial infarction and post-traumatic stress disorder: Frequency, outcome, and atherosclerotic mechanisms. *Eur J Cardiovasc Prev Rehabil* 13: 165–72
- Ginzburg K (2006) Comorbidity of PTSD and depression following myocardial infarction. *J Affect Disord* 94(1-3): 135–43
- Ginzburg K, Solomon Z, Koifman B et al (2003) Trajectories of posttraumatic stress disorder following myocardial infarction: a prospective study. *J Clin Psychiatry* 64: 1217–23
- Guler E, Schmid JP, Wiedemar L, Saner H, Schnyder U, von Känel R (2009) Clinical diagnosis of posttraumatic stress disorder after myocardial infarction. *Clin Cardiol* 32(3): 125–9
- Huffman JC, Smith FA, Blais MA, Januzzi JL, Fricchione GL (2008) Anxiety, independent of depressive symptoms, is associated with in-hospital cardiac complications after acute myocardial infarction. *J Psychosom Res* 65: 557–63
- Janeway D (2009) An integrated approach to the diagnosis and treatment of anxiety within the practice of cardiology. *Cardiol Rev* 17: 1–9
- Januzzi JL, Stern TA, Pasternak RC, De Sanctis RW (2000) The influence of anxiety and depression on outcomes of patients with coronary artery disease. *Arch Intern Med* 160: 1913–21
- Joekes K, Maes S, Boersma SN, van Elderen T (2005) Goal disturbance, coping, and psychological distress in partners of myocardial infarction patients: Taking account of the dyad. *Anxiety Stress Coping* 18: 255–67
- Jones C, Griffiths RD, Humphris G et al (2001) Memory, delusions, and the development of acute posttraumatic stress disorder-related symptoms after intensive care. *Crit Care Med* 29: 573–80
- Karsdorp PA, Kindt M, Rietveld S, Everaerd W, Mulder BJM (2009) False heart rate feedback and the perception of heart symptoms in patients with congenital heart disease and anxiety. *Int J Behav Med* 16: 81–8
- Kubzansky LD, Koenen KC (2009) Is posttraumatic stress disorder related to development of heart disease? An update. *Cleve Clin J Med* 76(Suppl 2): S60–S5
- Kubzansky LD, Koenen K, Jones C, Eaton WW (2009) A prospective study of post-traumatic stress disorder symptoms and coronary heart disease in women. *Health Psychol* 28(1): 125–30
- Kuhl EA, Fauerbach JA, Bush DE, Ziegelstein RC (2009) Relation of anxiety and adherence to risk-reducing recommendations following myocardial infarction. *Am J Cardiol* 103: 1629–34.
- Ladwig K-H, Baumert J, Marten-Mittag B, Kolb C, Zrenner B, Schmitt C (2008) Posttraumatic stress symptoms and predicted mortality in patients with implantable cardioverter-defibrillators: Results from the prospective living with an implanted cardioverter-defibrillator study. *Arch Gen Psychiatry* 65: 1324–30
- Luyster FS, Hughes JW, Gunstad J (2009) Depression and anxiety symptoms are associated with reduced dietary adherence in heart failure patients treated with an implantable cardioverter defibrillator. *J Cardiovasc Nurs* 24: 10–17
- Moser DK, Dracup K (1996) Is anxiety early after myocardial infarction associated with subsequent ischemic and arrhythmic events? *Psychosom Med* 58: 395–401
- National Audit of Cardiac Rehabilitation Team, BHF Care & Education Research Group, University of York (2009) *National Audit of Cardiac Rehabilitation Annual Report 2009*. www.cardiacrehabilitation.org.uk (accessed 23 February 2010)

- National Collaborating Centre for Mental Health (2005) Post-traumatic stress disorder. The management of PTSD in adults and children in primary and secondary care [Full version of NICE clinical guideline CG26]. <http://guidance.nice.org.uk/CG26> (accessed 23 February 2010)]
- Owen RL, Koutsakis S, Bennett PD (2001) Post-traumatic stress disorder as a sequel of acute myocardial infarction: An overlooked cause of psychosocial disability. *Coronary Health Care* 5: 9–15
- Oxlad M, Stubberfield J, Stuklis R, Edwards J, Wade TD (2006) Psychological risk factors for increased post-operative length of hospital stay following coronary artery bypass graft surgery. *J Behav Med* 29: 179–90
- Rocha LP, Peterson JC, Meyers B et al (2008) Incidence of posttraumatic stress disorder (PTSD) after myocardial infarction (MI) and predictors of PTSD symptoms post-MI—A brief report. *Int J Psychiatry Med* 38: 297–306
- Shemesh E, Yehuda R, Milo O (2004) Posttraumatic stress, nonadherence, and adverse outcome in survivors of a myocardial infarction. *Psychosom Med* 66: 521–6
- Spindler H, Pedersen SS (2005) Posttraumatic stress disorder in the wake of heart disease: prevalence, risk factors, and future research directions. *Psychosom Med* 67: 715–23
- Suls J, Bunde J (2005) Anger, anxiety, and depression as risk factors for cardiovascular disease: The problems and implications of overlapping affective dispositions. *Psychol Bull* 131: 260–300
- Tedstone JE, Tarrier N (2003) Posttraumatic stress disorder following medical illness and treatment. *Clin Psychol Rev* 23: 409–48
- Tully PJ, Baker RA, Turnbull D, Winefield H (2008) The role of depression and anxiety symptoms in hospital readmissions after cardiac surgery. *J Behav Med* 31: 281–90
- Turton P, Hughes P, Evans CD, Fainman D (2001) Incidence, correlates and predictors of post-traumatic stress disorder in the pregnancy after stillbirth. *Br J Psychiatry* 178: 556–60
- White KS, Craft JM, Gervino EV (2010) Anxiety and hypervigilance to cardiopulmonary sensations in non-cardiac chest pain patients with and without psychiatric disorders. *Behav Res Ther* 48(5):394-401
- Wiedemar L, Schmid J-P, Müller J et al (2009) Prevalence and predictors of posttraumatic stress disorder in patients with acute myocardial infarction. *Heart Lung* 37: 113–21
- Young QR, Ignaszewski A, Fofonoff D et al (2007) Brief screen to identify 5 of the most common forms of psychosocial distress in cardiac patients: validation of the screening tool for psychological distress (STOP-D) *J Cardiovasc Nurs* 22: 525–34

Table 1. DSM-IV criteria for PTSD (American Psychiatric Association, 1994)

Criteria		
Event		• Must involve threatened death, serious injury or threat to physical integrity of self or other • Individual must respond with intense fear, helplessness or horror
Symptoms	Re-experiencing 1 or more:	• Recurrent and intrusive distressing recollections of the event • Recurrent distressing dreams of the event • Acting or feeling as if the event were recurring (e.g. flashbacks, hallucinations) • Intense psychological distress when exposed to reminders of the event • Physiological reactivity when exposed to reminders of the event
	Avoidance & Numbing 3 or more:	• Efforts to avoid thoughts, feelings, or conversations associated with the event • Efforts to avoid activities, places, or people that will remind them of the event • Inability to recall some aspects of the event • Diminished interest or participation in significant activities • Feeling of detachment or estrangement from others • Restricted range of affect • Sense of foreshortened future
	Arousal 2 or more:	• Difficulty falling or staying asleep • Irritability or outbursts of anger • Difficulty concentrating • Hypervigilance • Exaggerated startle response
Duration		1 month or more
Disability		Symptoms cause clinically significant distress or impaired functioning