Australian Critical Care 28 (2015) 24–30

Contents lists available at ScienceDirect

Australian Critical Care

journal homepage: www.elsevier.com/locate/aucc

Cardiovascular risk profile before coronary artery bypass graft surgery in relation to depression and anxiety disorders: An age and sex propensity matched study

Phillip J. Tully[a,b,*], Richard F. Newland[a], Robert A. Baker[a]

[a] Cardiac Surgery Research, Department of Surgery, Flinders Medical Centre, South Australia, Australia
[b] Freemasons Foundation Centre for Men's Health, Discipline of Medicine, School of Medicine, The University of Adelaide, Australia

ARTICLE INFORMATION

Article history:
Received 17 October 2013
Received in revised form 8 January 2014
Accepted 22 April 2014

Keywords:
Depressive disorder
Anxiety disorders
Coronary artery bypass
Cardiopulmonary bypass

ABSTRACT

Objective: The cardiovascular risk profile and postoperative morbidity outcomes of anxiety disorder patients undergoing coronary artery bypass surgery is not known.
Methods: In a cross-sectional design, 114 consecutive coronary artery bypass graft surgery patients were evaluated to create four matched groups (30 with anxiety disorder, 27 with depression disorder and 57 age-sex matched coronary artery bypass surgery control patients with no depression or anxiety disorder).
Results: By comparison to non-depression disorder age-sex matched controls, depressed patients presented for coronary artery bypass surgery with significantly greater myocardial inflammatory markers (Troponin T > 02, 33.3% vs. 11.1%, $p = .03$), metabolic risk (body surface area > 35 (22.2% vs. 0%, $p = .03$), comorbid cardiovascular risk (peripheral vascular disease 18.5% vs. 0%, $p = .05$). Depressed patients also recorded longer intraoperative time at higher temperatures >37 °C on cardiopulmonary bypass (11.1 ± 9.0 vs. 6.0 ± 4.9, $p < 005$) and had higher maximum postoperative Troponin T ($.44 \pm .2$ vs. $.28 \pm .1$, $p = .03$). Patients with anxiety disorder on the other hand presented with significantly higher Creatinine Kinase-Muscle Brain (5 IQR 4–5 ng/ml vs. 4 IQR 3–4 ng/ml, $p = .04$), higher intraoperative glucose levels (7.8 ± 2.5 mmol/l vs. 7.0 ± 1.2 mmol/l, $p = .05$), and received fewer grafts ($2.1 \pm .9$ vs. $2.5 \pm .9$ $p = .04$).
Conclusions: A differential cardiovascular risk profile and postoperative outcome was observed dependent on anxiety and depression disorder status. There were few modifiable cardiovascular risk factors at the time of surgery other than psychiatric status, perioperative management of depression and anxiety may have promise to reduce further cardiac morbidity after coronary artery bypass surgery.

1. Introduction

A prognostic association between psychological depression and postoperative morbidity after coronary artery bypass graft (CABG) surgery has been previously documented.[1–5] The suspected mechanisms through which depression leads to cardiopathogenesis have been comprehensively reviewed[6] and include dysregulation of the hypothalamic–pituitary–adrenal axis, reduced heart-rate-variability, altered serotonergic pathways, inflammatory response and altered platelet aggregability, and dysrhythmia. The pathophysiological processes in depression may be particularly relevant to cardiac surgery and critical care settings because they are also known to be substantially influenced by the use of cardiopulmonary bypass (CPB).[2] However, despite recognition of depression posing a risk for further CHD morbidity,[1–3,7] there are few systematic investigations of the pathophysiological processes and risk factors faced by cardiac surgery patients with a psychiatric disorder.[8] Therefore the potential implications for surgical, anaesthetic, perfusion and intensive care unit practices remain relatively unknown.

There is a paucity of research that has examined the psychiatric disorders interrelated with depression, namely anxiety, with

* Corresponding author at: Discipline of Medicine, The University of Adelaide, SA 5005, Australia. Tel.: +61 8 8404 2015; fax: +61 8 8404 2019.
E-mail addresses: phillip.tully@adelaide.edu.au, drphil.81@gmail.com (P.J. Tully).

http://dx.doi.org/10.1016/j.aucc.2014.04.006
1036-7314/

respect to cardiovascular risk in CABG patients. Indeed, anxiety is common prior to CABG surgery[9] and also during intensive care unit stay and after.[10–12] Though anxiety disorders appear to confer morbidity risk comparable with that reported for depression after CABG surgery,[13–16] it is not known whether anxiety and depression disorders might affect CHD morbidity through common, or alternatively distinct pathophysiological pathways.[17–19] In this prospective cohort study among CABG surgery patients we identify a group of patients with either depression or anxiety disorder and compare their cardiovascular risk profile to patients without a psychiatric disorder.

2. Patients and methods

Patients were prospectively recruited from Flinders Medical Centre, South Australia between February 2007 and March 2009. Study approval (H-010-2007, 112/067) was given by the Human Research Ethics Committee and all patients provided written informed consent.[20] Patients were considered eligible for the study if aged >18 years and undergoing CABG with CPB, with or without concomitant valve procedure. Patients were approached at preadmission clinic prior to surgery until >25 patients were recruited with depression disorder and >25 patients with anxiety disorder had been reached, similar to the strategy adopted by Bankier et al.[21] As with Bankier et al.,[21] we recruited a larger number of patients free from anxiety or depression disorder as the psychiatric interview took place after patient recruitment, and psychiatric disorders are prevalent in less than 40% of CABG surgery patients.[7,22]

The recruitment flow chart is shown in Fig. 1. A total of 167 patients were interviewed in person before surgery, median 3 days (interquartile range 1–3 days). A MINI diagnosis of alcohol and substance abuse, and severe psychiatric illness precluded 8 patients from participating in the study further. Comorbid depression–anxiety precluded another 13 patients from analysis and 1 patient withdrew consent, leaving 145 patients eligible for these analyses and age-sex matching. Among these patients, 88 were free from any psychiatric disorder, whereas the identified psychiatric group consisted of 27 patients with major depression disorder (MDD), and 30 with anxiety disorder. From the pool of 88 patients without mental disorder only 57 were included in these analyses as per the study protocol. Age-sex matching proceeded in one-to-one fashion with a patient from either the MDD group ($N = 27$) or anxiety disorder group ($N = 30$).

2.1. Psychiatric status

The MINI Plus International Neuropsychiatric Interview assessed current depression, anxiety and other psychiatric

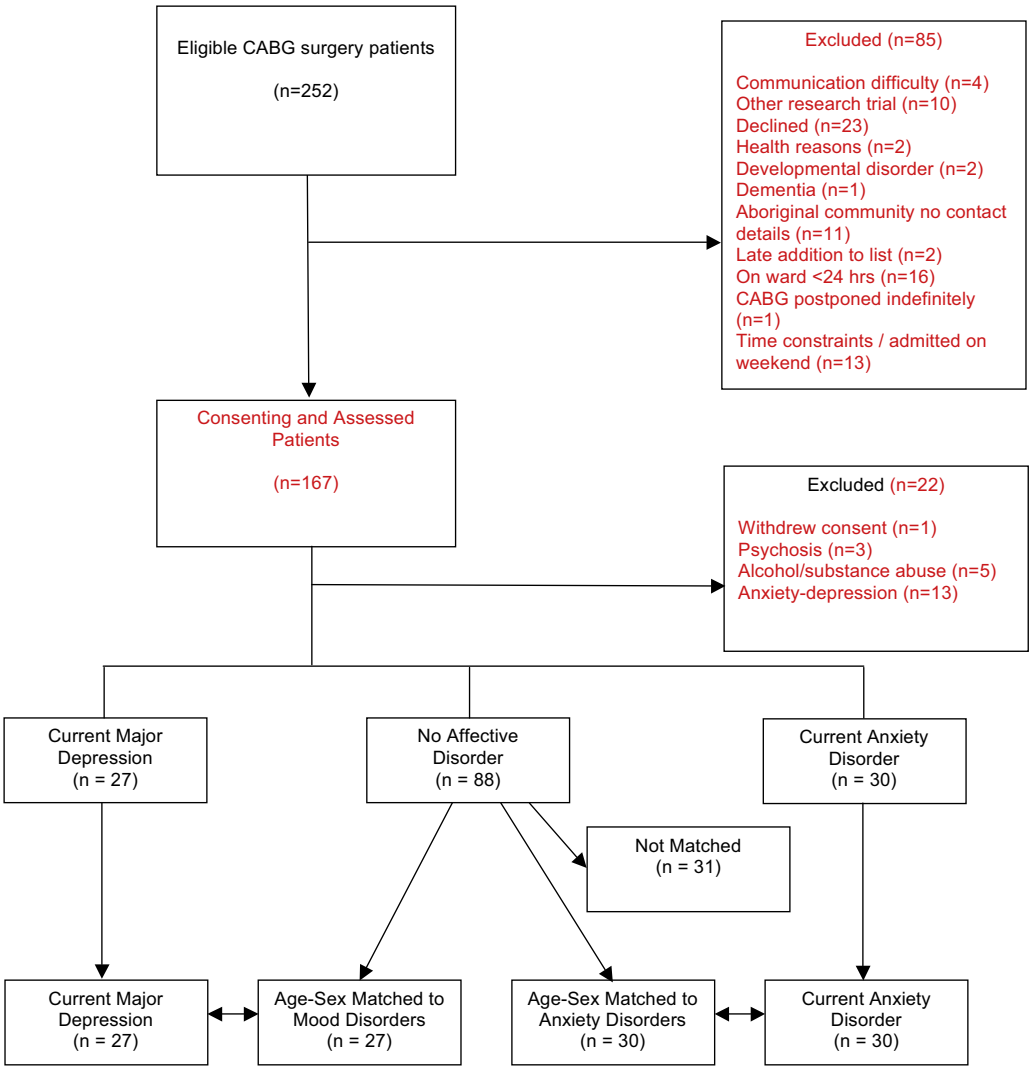

Fig. 1. Flow chart of patients through the study.