

## Supplementary material

### **Descriptive Study of Anxiety and Posttraumatic Stress Disorders in Cardiovascular disease patients: From Referral to Cardio-Psychiatric Diagnoses**

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#### *Research Protocol*

Independent double data entry was performed by two trained staff members (an undergraduate Health Sciences student and a medical secretary) in order to capture potential data entry errors. Eligible medical charts were classified according to psychiatric diagnosis and cardiac diagnosis. When there was doubt regarding the psychiatric diagnosis, the medical charts were reviewed by Dr. Judith Brouillette, psychiatrist, who made a determination as to the diagnosis. When there was doubt regarding the cardiac diagnosis or its categorization, Dr. Katia Dyrda, cardiologist, was consulted and made a determination.

#### *Statistics*

#### *Primary Outcomes*

- Type of anxiety disorders (Panic disorder and/or Agoraphobia (PD/Agoraphobia), Generalized Anxiety Disorder (GAD) or Posttraumatic Stress disorder (PTSD))
- Type of cardiovascular disease (CVD) (Coronary Heart Disease (CHD), Heart Failure and/or Valve disease (HF/valve), or Arrhythmia)

#### *Secondary Outcomes*

- Referral for anxiety (yes/no)
- Confirmed clinical diagnosis of anxiety disorder (yes/no)
- Referral for depression (yes/no)
- Confirmed clinical diagnosis of major depressive disorder (yes/no)

Reasons for consultation were determined via review of the referring cardiologist's notes. When included in these notes, words such as: agoraphobia, anxiety, anxiety disorder, anxious mood, obsessive-compulsive disorder, panic, posttraumatic stress, phobia stress and somatization were considered to constitute a referral for anxiety. When included in the cardiologist's notes, words such as: burnout, depression, depressed mood, exhaustion or extreme fatigue, loss of interest, low mood/affect, melancholia and sadness were considered to constitute a referral for depression. Confirmed anxiety was defined by the presence of any anxiety disorders diagnosis in the psychiatrist's report following the patient interview; likewise, confirmed depression was defined as the diagnosis of major depressive disorder being noted in the psychiatrist's report following a patient interview.

### *Other Measures*

Baseline data were collected from the medical charts in order to better describe the population, including age, gender, ethnicity, marital status, living arrangements, presence of comorbid anxiety and depression, use of psychotropic medications, presence of other CVD comorbidity including congenital heart disease (defined as gross structural abnormality of the heart or intra-thoracic great vessels that is actually or potentially of functional significance, including mild, moderate, and severe heart defects), and implantation of a pacemaker/defibrillator.

### *Sample Size Calculation*

The sample size was calculated as a function of our main objective (assessment of specific associations between CVD and anxiety disorders). Among CVD patients, we expected approximately 40% to be classified as CHD, 30% as HF/valve, and 30% as arrhythmia patients. With respect to anxiety disorders, we expected, based on our clinical experience, a distribution similar to that illustrated in Table S1. Table S1 corresponds to an effect size of 0.1356 ( $X^2=13.56$ ). With 100 patients having confirmed diagnoses of anxiety disorders and CVD, a Chi-square test with a 0.05 significance threshold would allow detection of this effect size with 85% power.

### *Statistical Analysis*

The proportion of referred patients with a confirmed anxiety or depressive disorder diagnosis is presented with a 95% confidence interval (CI).

Descriptive statistics for baseline variables are presented by anxious disorder for subjects with confirmed anxiety disorder and CVD diagnoses. Continuous variables are presented as mean and standard deviation (SD) and categorical variables as count and percentage.

The association between anxiety disorder type and CVD type is analysed with a Chi-square test. The association is further studied using a multinomial logistic regression model with the type of anxiety disorder as dependent variable and the CVD type as independent variable. This model also includes epidemiological, psychosocial or medical factors that may be responsible for the specific association of certain pairs of cardiac/anxiety diagnoses (gender, age, civil status, living alone, cardiac comorbidity, congenital heart disease, pacemaker/defibrillator, psychiatric comorbidity, and use of psychotropic medication).

For all analyses, the significance level was 0.05. The analyses were done using SAS version 9.4.

### *Sample characteristics*

Of the medical records of 450 consecutive patients referred to the psychosomatic clinic of the Montreal Heart Institute, 58 were rejected since they met an exclusion criterion (Figure S1). This left 392 patients to study the concordance of referral and diagnosis (Objective 1). Table S2 illustrates types of psychiatric diagnoses received by patients referred to the psychosomatic clinic by cardiologists

Table S3 summarizes the demographic information as well as medical, cardiac and psychiatric diagnoses of the 102 patients used to study the association between the type of CVD and anxiety disorders.

**Table S1.** Expected distribution of anxious disorders by cardiovascular diseases

	<b>Coronary Heart Disease</b> (40% of subjects)	<b>Heart failure and/or valve disease</b> (30% of subjects)	<b>Arrhythmia</b> (30% of subjects)
<b>Panic Disorder/ Agoraphobia</b>	50%	30%	20%
<b>Generalized anxiety disorder</b>	30%	50%	30%
<b>Posttraumatic stress disorder</b>	20%	20%	50%

**Table S2.** Cross table: Confirmed psychiatric diagnoses by reason for consultation, as per cardiologist's notes.

Reasons for consultation		Confirmed diagnoses, as established by the psychiatrist				
		Anxiety disorder <i>n</i> =130	Depressive disorder <i>n</i> =48	Anxiety and depressive disorders <i>n</i> =13	Other mental disorders <i>n</i> =138	No mental disorder <i>n</i> =63
Anxiety symptoms	<i>n</i> =167	95 (57)	3 (2)	2 (1)	47 (28)	20 (12)
Depressive symptoms	<i>n</i> =115	11 (10)	32 (28)	5 (4)	40 (35)	27 (23)
Anxio-depressive symptoms	<i>n</i> =45	14 (31)	8 (18)	5 (11)	14 (31)	4 (9)
Other reasons	<i>n</i> =65	10 (15)	5 (8)	1 (2)	37 (57)	12 (18)

Data are presented as numbers (row %)

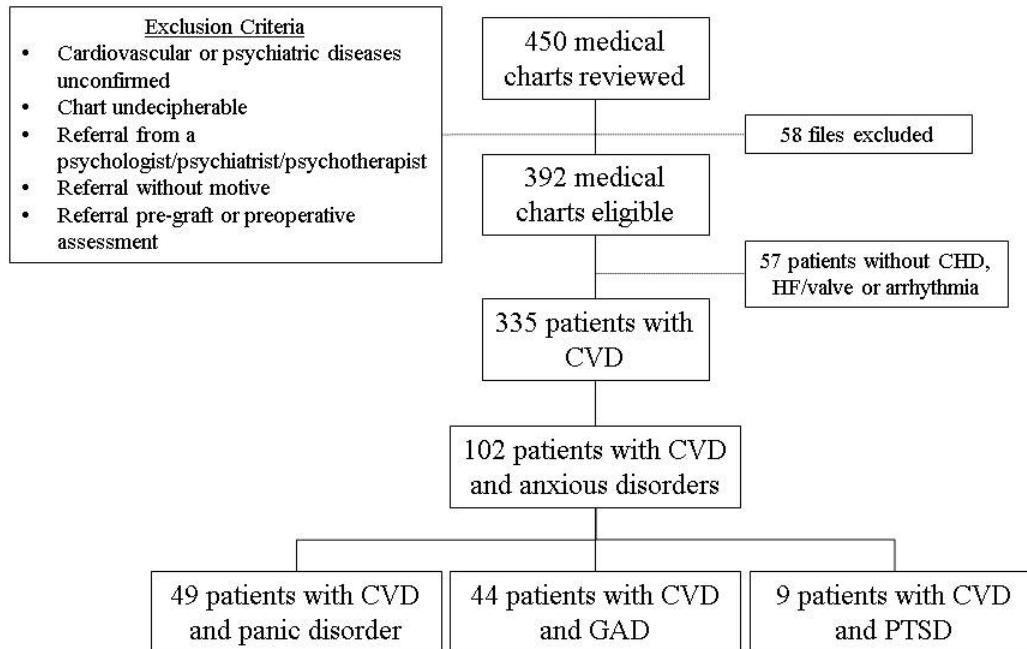
**Table S3.** Demographic and medical descriptions of the 102 patients with both an anxiety disorder and cardiovascular disease

Type of anxious disorder	PD/Agoraphobia (n=49)	GAD (n=44)	PTSD (n=9)	Missing data
Age at first consultation	55 ± 16	53 ± 16	59 ± 20	-
Female	22 (45)	15 (34)	5 (56)	-
Ethnicity				14
Caucasian	42 (93)	34 (97)	7 (88)	
African or Caribbean	1 (2)	0 (0)	0 (0)	
Other	2 (4)	1 (3)	1 (13)	
Occupational status				9
Work	18 (42)	19 (44)	1 (14)	
Retired	14 (33)	14 (33)	4 (57)	
Work stoppage	3 (7)	4 (9)	2 (29)	
Social welfare	2 (5)	3 (7)	0 (0)	
Other	6 (14)	3 (7)	0 (0)	
Living alone	14 (30)	11 (26)	3 (33)	4
Civil status				-
In couple	29 (59)	26 (59)	3 (33)	
Divorced or separated	8 (16)	6 (14)	2 (22)	
Single	9 (18)	10 (23)	2 (22)	
Widow	3 (6)	2 (5)	2 (22)	
CHD	20 (41)	18 (41)	3 (33)	-
HF/valve	13 (27)	15 (34)	1 (11)	-
Arrhythmia	16 (33)	11 (25)	5 (56)	-
Congenital disease	2 (4)	9 (20)	1 (11)	-
Having two cardiac diseases or more	10 (20)	13 (30)	3 (33)	-
Pacemaker/defibrillator	9 (18)	8 (18)	2 (22)	-
Hypertension	21 (46)	19 (43)	3 (38)	4
Dyslipidemia	24 (53)	13 (32)	3 (43)	9
Diabetes	8 (20)	5 (12)	0 (0)	14
Active use of tobacco	9 (22)	9 (25)	1 (17)	20
Having two anxious disorders or more	9 (18)	15 (34)	2 (22)	-
Personality traits/disorder	1 (2)	14 (32)	1 (11)	3
Active use of psychotropic Rx	39 (80)	39 (89)	7 (78)	-

Data are presented as means ± SD or numbers (%), by anxious disorders

CHD, Coronary Heart Disease; HF/valve, heart failure and/or valve disease; GAD, Generalized Anxiety Disorder; PD/Agoraphobia, Panic Disorder and/or Agoraphobia; PTSD, Posttraumatic Stress Disorder; Rx, medication; SD, standard deviation; %, percentage;

**Figure S1.** Organigram of the selected medical charts included in the study



CHD, Coronary Heart Disease; CVD, Cardiovascular diseases; GAD, Generalized anxiety disorder; HF/valve, Heart failure and/or valve disease, PTSD, posttraumatic stress disorder