Journal of Affective Disorders 204 (2016) 180–186

Contents lists available at ScienceDirect

Journal of Affective Disorders

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

Research paper

Mental disorders in adults with congenital heart disease: Unmet needs and impact on quality of life

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ARTICLE INFO

Article history:
Received 17 March 2016
Received in revised form
13 June 2016
Accepted 14 June 2016
Available online 22 June 2016

Keywords:
Congenital heart disease
Depression
General anxiety disorder
Quality of life

ABSTRACT

Objective: In adult congenital heart disease (ACHD), mental health status and quality of life become important issues due to improved life expectancy. Current literature provides conflicting data regarding mental health status in ACHD. Furthermore, none of the studies so far compared prevalence rates with a matched control group.

Methods: The prevalence of mental disorders was assessed in 150 ACHD using a structured interview, and compared to 12-months estimates of the general German population. Quality of life (QoL) was measured with World Health Organization Quality of Life instrument. Furthermore, we related the diagnostic results of widely used screening instruments for depression (Beck Depression Inventory-2; BDI-2; Hospital Anxiety and Depression Scale; HADS) with clinical diagnoses, to receive optimal sensitivity and specificity values.

Results: The prevalence of psychiatric disorders was significantly higher in ACHD than in the general population (48.0%; CI: 44.7–60.0 vs. 35.7%; CI: 33.5–37.9). Mood (30.7%; CI: 24.0–38.0 vs. 10.7%;CI:9.4–12.0) and anxiety disorders (28.0%; CI:22.0–36.7 vs. 16.8%; CI: 15.0–18.6) were the leading causes of psychiatric illness. Sixteen of 150 ACHD patients (10.7%) received specific treatment for psychiatric disorders before entering the study. Overall quality of life was independently and negatively associated with a diagnosis of major depression ($p < 0.001$), alcohol dependency ($p = 0.004$), nicotine dependency ($p = 0.036$), and NYHA class ($p = 0.007$). Accuracy of the HADS-D and BDI-2 as screening instruments was moderate (AUC 0.60–0.81), depending on the cut-off score used.

Conclusions: Psychiatric disorders, particularly mood and anxiety disorders are significantly more frequent in ACHD compared to the general population. However, these disorders are rarely diagnosed resulting in under treatment and loss of quality of life. Quality of life is independently associated with the existence of mood, anxiety and substance use disorders. When self-rating instruments (BDI-2, HADS) are used as screening instruments in ACHD care, lower cut-off values are recommended.

1. Introduction

Advances in the medical and surgical management of patients with congenital heart disease have significantly improved life expectancy. In particular, in high-income countries 90% of patients can expect to reach adulthood (Kempny et al., 2013). However, many patients present with residua and sequela from surgical or interventional procedures that may increase the probability for medical complications (Baumgartner et al., 2010). In addition, some patients are faced with specific psychological and social concerns. Potential challenges include heart-focused anxiety, concerns about mortality, treatment decision-making, surgical preparation, adjustment to implanted cardiac devices, difficult pediatric-adult transitions, adherence concerns, educational issues, and compromised employability (Moons et al., 2002; Kovacs et al., 2005; Apers et al., 2013).

Mental disorders have been examined in ACHD, although the studies so far yielded conflicting results. Studies relying on self-rating instruments for the diagnosis of mental disorders found similar or superior psychological functioning in ACHD (Utens et al., 1998; Cox et al., 2002; Loup et al., 2009; Muller et al., 2012, 2013 ;

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http://dx.doi.org/10.1016/j.jad.2016.06.047
0165-0327/

Bang et al., 2013; Eslami et al., 2013; Kourkoveli et al., 2015). In contrast three smaller studies using structured interviews for psychiatric assessment observed higher rates of depression and anxiety disorders (Horner et al., 2000; Bromberg et al., 2003; Kovacs et al., 2009). In the study by Kovacs and colleagues, only 11/16 ACHD patients with a comorbid mental disorder received psychopharmacological or psychotherapeutic treatment (Kovacs et al., 2009; see Table 1).

The small number of patients in the studies cited above, and the absence of a comparison group limit the interpretability of the results. Additionally, these studies disregarded the evaluation of other frequent psychiatric disorders, such as substance abuse, eating disorders, obsessive compulsive disorder and somatoform disorder.

Studies concerning quality of life (QoL) in ACHD also yielded inconsistent findings, either pointing to decreased, equal or even better QoL in ACHD (for review see Fteropoulli et al., 2013; Apers et al., 2013). Several factors that potentially determine QoL in ACHD have been determined, however, the influence of several mental disorders on QoL such as substance use disorders have not been studied so far.

Therefore, the objective of this study were.

1) to assess the prevalence of mental disorders in a cohort of 150 ACHD patients using the Structured Interview for DSM-IV (SCID),
2) to compare the frequency of mental disorders in ACHD with prevalence estimates from the general population of the same age range in Germany,
3) to assess the effects of psychiatric disorders on quality of life in ACHD.

2. Methods

2.1. Participants

Patients were recruited from the ACHD outpatient Clinic of the Dep. of Cardiology and Angiology at the Hannover Medical School (Hannover, Germany). The inclusion criteria were as follows: (1) structural congenital heart disease, (2) ability to read and complete the consent form and questionnaires in German, and (3) age of 18 or older. Exclusion criteria were pregnancy and unstable cardiac condition.

2.2. Design and procedure

This cross-sectional study (PsyConHeart; *Psy*chiatric disorders in adults with *Con*genital *Heart* disease) received the approval of the Institutional Ethical Review Board at the Hannover Medical School.

Between May 2013 and May 2014, one-hundred sixty-four patients were approached, and 153 consented to take part in the study. Of these, 3 patients were excluded for incomplete data.

After providing written informed consent, all patients completed study packets that included a demographics and background information survey, and psychosocial measures. All patients participated in a structured clinical interview that was administered by senior psychiatric physicians. Patients who met the diagnostic criteria for a psychiatric disorder were provided with mental health referral information and/ or the coordination of subsequent mental health treatment.

2.3. Assessment of psychosocial functioning

Participants completed a demographic survey that included the

Table 1
Summary of former studies examining mental disorders in ACHD. BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory; CES-D: Center for Epidemiologic Studies-Depression Scale; HADS: Hospital Anxiety and Depression Scale; MDD: major depressive disorder; PD: panic disorder; STAI: State and Trait Anxiety Inventory.

Study	N	Mean age (y)	Female (%)	Control group	Assessment	Outcome
Utens et al., 1998	166	21.7y (19–25y)	73%	Dutch normative reference group	Young Adult Self Report Scale	No difference concerning depression and anxiety scores between ACHD and reference group
Horner et al., 2000	29	38y (26–56y)	44.8%	None	Interview according to DSM-III-R	4/29 (13.8%) met criteria for MDD 5/29 (17.2%) met criteria for PD
Cox et al., 2001	87	31.7y (17–73y)	59%	80 orthopedic outpatients	HADS	Lower HADS scores in ACHD
Bromberg et al. 2003	22	33.7y (± 11.2)	59%	None	SCID, restricted to depression and anxiety section	27.3% MDD 9.1% GAD
Loup et al., 2009	345	26y (± 11)	39%	Age and gender matched standard population data	HADS	No difference in HADS sum score for anxiety and depression
Kovacs et al., 2009	280	32y (± 11.3)	52%	None	Restricted to depression and anxiety SCID: 58/280 SRS: 222/280	29% mood disorder 17% anxiety disorder
Muller et al., 2012	767	25.6y (14–67)	45.8%	Reference population	CES-D	Lower CES-D scores in ACHD compared to reference data (8.6% fulfilled CES-D criteria for MDD)
Muller et al., 2013	879	26.3y (15–71y)	46%	40 healthy controls	STAI CES-D	No difference compared to healthy controls concerning depression and anxiety scores
Bang et al., 2013	85	26.5y (20–52y)	43.7%	None	BDI BAI	24% BDI sum score >9 43% BAI sum score >7
Eslami et al., 2013	347	33.2y (18–64y)	52.2%	353 matched healthy controls	HADS	Slightly but not significantly increased HADS anxiety subscale score in ACHD, no difference in HADS depression subscale
Kourkoveli et al., 2015	60	28.9y ± 11.4	46.7%	None	BDI	BDI sum score >9 in 28% ACHD patients