

# Depression among Cardiovascular Disease Patients on a Consultation-liaison Service at a General Hospital in Jamaica

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## ABSTRACT

**Objective:** The prevalence of cardiovascular disease in Jamaica and other Caribbean countries has been steadily rising. Depression has been associated with increased morbidity and mortality in patients with cardiovascular disease. Against this background, the authors compared the co-occurrence of depressive illnesses among general hospital inpatients with cardiovascular disease and those without cardiovascular disease.

**Method:** Psychiatric and non-psychiatric diagnoses on all inpatients referred to the consultation-liaison psychiatry service at a general hospital in Jamaica were recorded over a one-year period and analysed using chi-square, t-tests, binary logistic regression and odds ratio. Statistical significance was taken at the 0.05 level.

**Results:** Of the 201 patients referred, 17.9% had cardiovascular disease and 19.9% had depressive illnesses. One third of patients with cardiovascular disease were depressed. They were also significantly more likely than other patients to have a depressive illness (OR = 2.93, 95% CI: 1.25, 6.85).

**Conclusion:** Special attention to the prevention, detection and treatment of depression should be applied to patients with cardiovascular disease.

**Keywords:** Caribbean region, cardiovascular disease, depression

# La Depresión entre los Pacientes con Enfermedades Cardiovasculares en el Servicio de Interconsulta Psiquiátrica del Hospital General de Jamaica

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## RESUMEN

**Objetivo:** La prevalencia de las enfermedades cardiovasculares en Jamaica y otros países del Caribe se ha mantenido en constante crecimiento. La depresión ha estado asociada con un aumento de la morbilidad y la mortalidad en los pacientes con enfermedades cardiovasculares. Frente a este antecedente, los autores compararon la co-ocurrencia de las enfermedades depresivas entre los pacientes con enfermedades cardiovasculares ingresados en el hospital general, con aquellos que no sufrían estas enfermedades.

**Método:** Los diagnósticos psiquiátricos y no psiquiátricos de todos los pacientes remitidos al servicio de interconsulta de psiquiatría del hospital general de Jamaica, fueron registrados por un período de un año, y analizados utilizando pruebas de chi-cuadrado, pruebas t, regresión logística binaria, y el cociente de probabilidades (odds ratio). La significación estadística fue tomada en el nivel 0.05.

**Resultados:** De los 201 pacientes remitidos, 17.9% tenían enfermedades cardiovasculares, y el 19.9% tenían enfermedades depresivas. Una tercera parte de los pacientes con enfermedades cardiovasculares se sentían deprimidos. Asimismo eran significativamente más propensos a padecer enfermedades de depresión, en comparación con los otros pacientes (OR = 2.93, 95% CI: 1.25, 6.85).

**Conclusión:** Debe prestarse especial atención a la prevención, detección y tratamiento de la depresión en pacientes con la enfermedad cardiovascular.

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**Palabras claves:** Región del Caribe, enfermedad cardiovascular, depresión

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## INTRODUCTION

Consultation-liaison (CL) psychiatry refers to the knowledge, skills and practice utilized in evaluating and treating the emotional and behavioural conditions in patients being treated primarily by non-psychiatric medical specialities. While many of these patients have interwoven pre-existing co-morbid psychiatric conditions, others suffer from emotional and behavioural problems which result from the medical illness itself or as a direct consequence of a reaction to its treatment (1). Thus, the consultation-liaison psychiatrist is called upon to evaluate and treat a wide variety of psychiatric disorders in patients with general medical conditions. A trawl of the literature revealed that the prevalence of mental disorders in general hospital inpatients range from 41.3% to 46.5% (2). However, it has been reported that unless a specific liaison psychiatry service exists within the general hospital, a significant proportion of psychiatric co-morbidity will remain undetected and untreated (2).

A landmark World Health Organization study has confirmed that depressive, anxiety, neurasthenic and alcohol misuse disorders are the most common disorders seen in the consultation-liaison setting (3). Other research indicates that the co-morbidity between cardiovascular disease and depression on consultation-liaison services is significant (4, 5). Depression coexisting with non-psychiatric medical conditions has a poorer outcome in terms of quality of life as well as social and physical functioning (6). Co-morbid depression is also associated with increased morbidity and mortality (6, 7). Cardiovascular disease is the most common cause of mortality in the United States of America (USA), accounting for approximately 39.9% of all deaths in 2006 [80 million people] (8). This has been a long-standing public health issue in high income countries owing to the preponderance of unhealthy dietary and sedentary lifestyle practices (9). Research shows that depression occurs in 16%–23% of patients with cardiovascular disease, with an even larger proportion experiencing subsyndromal depression (5). Frasure-Smith *et al* reported depression to be a significant predictor of mortality six months after myocardial infarction (MI) with a three-fold greater chance of dying or having a recurrent MI when there was a concurrent major depressive disorder (10).

It is to be noted that a diagnosis of co-morbid depression, irrespective of the severity, confers an increased risk of cardiac events in cardiovascular disease patients and is known to increase patient care costs and lower quality of life (11). Depressive symptoms even at low levels of severity increase the risk for new episodes of acute coronary events as well as increase the likelihood of recurrence of acute coronary syndromes and the resultant associated mortality (11). Moreover, prospective epidemiologic studies have shown

that the presence of co-morbid depression confers a significant risk of increased morbidity and mortality independent of other known prognostic markers (12, 13). These findings remain unchallenged despite the use of more than 25 different depression assessment instruments (11).

Wilks *et al* reported that over the last 50 years, the disease profile in Jamaica has shifted to resemble that of higher income countries as evidenced by a significant decline in tropical diseases and a marked increase in chronic non-communicable conditions (14). Cardiovascular disease accounts for 31%–50% of all certifiable deaths in Jamaica. It is the third leading cause of cost to the health sector in terms of hospitalization in the country (14, 15). It is a silent epidemic that is affecting Jamaica both financially and in terms of productivity (14). In 1999, cardiovascular disease was the leading cause of deaths at hospitals in Jamaica and the second leading contributor to extended hospital stays in the country (14).

This finding of extended hospital stays in cardiovascular patients in Jamaica has also been noted in higher income countries. One explanation postulated for the extended hospital stays documented in patients with cardiovascular disease is the presence of co-morbid depression in these persons. Depression itself may delay the recovery of the medical illness thus resulting in prolonged hospital stay (16).

The epidemiological transition in Jamaica reported by Wilks *et al* (14) has also been documented in the wider Caribbean by Ferguson and Tulloch-Reid (17) with cardiovascular disease now being ranked as the leading cause of death in the region. Their findings of a high prevalence of cardiovascular risk factors in Afro-Caribbean youth give emphasis to the probability that this increase in cardiovascular disease in low income countries is likely to remain untethered in the short to medium term (17).

This epidemiological shift underscores the need for urgent attention to be paid to cardiovascular disease and its complications. As part of this thrust, it would be important to investigate the relevance of depression in patients with cardiovascular disease in Jamaica and the Caribbean. We hypothesize that in keeping with the findings internationally, Jamaican patients with cardiovascular disease will also have a greater prevalence of depression when compared to patients with other medical and surgical illnesses. This paper seeks to determine the prevalence of depression in patients with cardiovascular disease at a multi-disciplinary teaching hospital in Jamaica and to compare the prevalence of depression to that found in patients with other medical and surgical diagnoses.

**SUBJECTS AND METHODS**

This study was approved by the University Hospital of the West Indies/University of the West Indies/Faculty of Medical Sciences Ethics Committee, having conformed to established ethical principles of research.

Over a one-year period, data on all patients referred to the consultation-liaison psychiatry service at the University Hospital of the West Indies (UHWI), a multi-disciplinary teaching hospital in Kingston, Jamaica, were prospectively collected along the following parameters:

1. Age and gender of patient
2. Non-psychiatric medical diagnosis, as stated by the referring medical/surgical service
3. Psychiatric diagnosis as determined by a consultation-liaison psychiatrist [these were Axis I diagnoses made using the diagnostic criteria of the Diagnostic and Statistical Manual for Mental Disorders, 4<sup>th</sup> edition; *ie* DSM-IV TR] (18).

Medical and surgical diagnoses were further classified into major disease categories, including the category of cardiovascular disease. Psychiatric diagnoses underwent similar further classification, with one of the diagnostic categories being depressive disorders. Using the Statistical Package for the Social Sciences (SPSS; version 12.0), the Chi-square test was used to explore a possible association between cardiovascular disease and depressive disorders. Chi-square tests, *t*-tests and binary logistic regression were also used, as appropriate, to explore other possible associations among the variables of age, gender, depressive disorders and cardiovascular disease. In all cases, statistical significance was taken at the 0.05 level.

**RESULTS**

Two hundred and one patients were referred to the consultation-liaison service over the year-long study period with 57.7% being females and 42.3% males (Table 1). The age range of patients was 8–96 years, with a mean age ( $\pm$  SD) of 41.0 ( $\pm$  18.7) years.

Table 1: Gender distribution of patients with and without a depressive disorder

|               | Depressive disorder present | Depressive disorder absent | Total             |
|---------------|-----------------------------|----------------------------|-------------------|
| <b>Male</b>   | 16 (40.0%)                  | 69 (42.9%)                 | 85 (42.3%)        |
| <b>Female</b> | 24 (60.0%)                  | 92 (57.1%)                 | 116 (57.7%)       |
| <b>Total</b>  | <b>40 (100%)</b>            | <b>161 (100%)</b>          | <b>201 (100%)</b> |

Of the 201 patients, 19.9% ( $n = 40$ ) were found to have depressive illnesses. There was no statistically significant difference in age for depressed patients compared with other patients (*t*-test;  $p > 0.05$ ). Neither was there any significant difference in gender distribution when these two patient groups were compared [Chi-square,  $p > 0.05$ ] (Table 1).

Cardiovascular disease was present in 17.9% of patients ( $n = 36$ ). Persons with cardiovascular disease were significantly older than other patients (*t*-test;  $p = 0.001$ ) with the mean age ( $\pm$  SD) for persons with cardiovascular disease being  $50.1 \pm 19.3$  years and the mean age for persons without cardiovascular disease being  $39.1 \pm 17.9$  years. There were, however, no significant gender differences when these two patient groups were compared [Chi-square;  $p > 0.05$ ] (Table 2).

Table 2: Gender distribution of patients with or without cardiovascular disease

|               | Cardiovascular disease present | Cardiovascular disease absent | Total             |
|---------------|--------------------------------|-------------------------------|-------------------|
| <b>Male</b>   | 19 (52.8%)                     | 66 (40.0%)                    | 85 (42.3%)        |
| <b>Female</b> | 17 (47.2%)                     | 99 (60.0%)                    | 116 (57.7%)       |
| <b>Total</b>  | <b>36 (100%)</b>               | <b>161 (100%)</b>             | <b>201 (100%)</b> |

Patients with cardiovascular disease had a significantly greater prevalence of depressive disorders (33.3%) than other patients (17.0%) [Chi-square,  $p = 0.026$ ] (Table 3).

Table 3: Prevalence of depressive disorder among patients with or without cardiovascular disease

|                                       | Depressive disorder present | Depressive disorder absent | Total             |
|---------------------------------------|-----------------------------|----------------------------|-------------------|
| <b>Cardiovascular disease present</b> | 12 (33.3%)                  | 24 (66.7%)                 | 36 (100.0%)       |
| <b>Cardiovascular disease absent</b>  | 28 (17.0%)                  | 137 (83.0%)                | 165 (100.0%)      |
| <b>Total</b>                          | <b>40 (19.9%)</b>           | <b>161 (80.1%)</b>         | <b>201 (100%)</b> |

Binary logistic regression was used to explore the association with depression of the covariates: age, gender and cardiovascular disease. Of the three covariates, only cardiovascular disease was found to be significantly associated with the presence of depressive disorder (Table 4). This was associated with an odds ratio of 2.925 (95% CI: 1.252, 6.849) indicating that persons with cardiovascular disease were

Table 4: Binary logistic regression model for predicting depression with age, gender and presence/absence of cardiovascular disease as covariates

|                                | Regression Coefficient | df | <i>p</i> | Odds Ratio | 95% CI       |
|--------------------------------|------------------------|----|----------|------------|--------------|
| <b>Age</b>                     | -0.014                 | 1  | 0.185    | 0.986      | 0.965, 1.007 |
| <b>Gender</b>                  | 0.099                  | 1  | 0.792    | 1.104      | 0.528, 2.306 |
| <b>Cardiovascular disorder</b> | 1.073                  | 1  | 0.013    | 2.925      | 1.252, 6.849 |

approximately three times as likely to have a depressive illness than persons without cardiovascular disease.

## DISCUSSION

A fairly high prevalence (17.9%) of cardiovascular disease was encountered in the patients in this study. These findings are in keeping with previous reports of high national figures. For example, the 2000 Jamaica Healthy Lifestyle Survey [JHLS] (19) showed that 19.9% of males and 21.7% of females suffered from hypertension which accounts for a large proportion of cardiovascular diseases in Jamaica. That survey also showed a 46% prevalence of obesity and a 7% prevalence of diabetes. All these conditions are strongly associated with cardiovascular morbidity and mortality (19, 20). A repeat of the survey in 2008 also showed an 11.7% prevalence of hypercholesterolaemia, another important risk factor for disability and death resulting from cardiovascular disease (21).

With regard to cardiovascular mortality, a report from the Pan American Health Organization (15) showed that 31% of all certifiable deaths in Jamaica resulted from cardiovascular disease. Similar findings have also been reported from hospitals in Jamaica where cardiovascular diseases accounted for 31%–50% of all certifiable deaths. The high economic cost of cardiovascular disease is another issue that cannot be ignored. According to the epidemiological profile of selected health conditions and services in Jamaica over the period 1990–2002 (22), the leading contributors to the cost of care at government hospitals were diseases of the circulatory system. In 1999, the allotted budget for the Ministry of Health was US\$188.2 million (15). It is noted that for the same period, the cost of cardiovascular diseases in Jamaica encompassing public, private, ambulatory and hospital based care was J\$1.8 billion. Of this J\$1.8 billion, J\$332 million, or 19% of the total, accounted for hospital based care of patients with cardiovascular disease (22, 23).

In Jamaica, there are national data that suggest that depression is a significant and growing concern. The 2008 JHLS (21) reports that 20.3% of persons between the ages of 15 and 74 years met the criteria for a major depressive episode in the past month prior to interview. Additionally, in an earlier study, Wilks *et al* (24) reported that 49% of respondents in a population based study reported feeling down or depressed. Similarly, depression was also found to be highly prevalent in this study. Of the 201 patients studied, almost one in five (19.9%,  $n = 40$ ) was found to have a depressive illness.

In the present study, depression was found to be more prevalent among patients with cardiovascular disease than among patients with other diagnoses. The results indicated that persons with cardiovascular disease were approximately three times more likely to have a depressive illness than persons without cardiovascular disease. Also, roughly one third of the patients with cardiovascular disease in the study met the criteria for a major depressive disorder. These findings

must be viewed in the context of the mounting body of evidence that depression is a significant risk factor for the development of cardiovascular disease and that its emergence in this group of patients portends a poor outcome with higher rates of mortality.

Depression is associated with a worse prognosis after myocardial infarction, whether or not the depression was diagnosed before or after the attack (25). It has also been reported that major depressive disorder is a better predictor of myocardial infarction, coronary artery bypass grafting (CABG), angioplasty or death in the twelve months following cardiac catheterization, than was age, cholesterol level, severity of the coronary artery disease, left ventricular ejection fraction, hypertension, smoking, diabetes or ventricular arrhythmias (25). The heightened risk for mortality among cardiovascular patients with depression is dramatically demonstrated in a study by Barefoot *et al* (26) in which 1250 cardiac patients were followed for 20 years after they were initially evaluated with the Zung self-rating depression scale. Those who were moderately to severely depressed had an 84% greater risk of cardiac death within 5–10 years when compared to their non-depressed counterparts.

Studies have shown that when compared with non-depressed patients, those with co-morbid depression have prolonged length of hospital stay and greater number of days in hospital. Koenig *et al* (27) showed that healthcare utilization, in terms of days of inpatient care, was significantly higher both during the admission period (25 vs 14 days) as well as during the follow-up period (16 vs 7 days) for depressed patients as compared to their non-depressed counterparts. It was further observed that cardiovascular patients with depression actually consume more healthcare resources during their initial stay and that this excess resource utilization persists even after discharge among those with depression (27, 28).

Depression in medically ill patients is frequently overlooked by non-psychiatric specialists (29). This may be related to an expectation on the part of physicians that there will be some depressive symptoms as a normal reaction to being diagnosed with a severe illness. Additionally, the constellation of the depressive symptoms may also be difficult to recognize in the presence of a major medical disorder. Thus, the diagnosis of depression in a cardiovascular disease patient is particularly challenging as many of these patients exhibit somatic symptoms such as tiredness, poor appetite, and difficulty concentrating which are also among the known symptoms of depression (29). While depression can contribute to the onset of cardiovascular disease by way of an overactive hypothalamic-pituitary-adrenocortical axis, platelet activation and decreased heart rate variability, patients with cardiovascular disease are themselves prone to develop depression. This may be as a consequence of the fear, frustration, physical disability and lifestyle changes (including loss of independence) associated with the diagnosis of cardiovascular disease (10, 30).

With the above in mind, it seems pertinent to suggest that initiation of mandatory depression screening for all patients diagnosed with cardiovascular disease may help to diminish the onset or mediate the severity of depressive symptoms in these patients. Whooley and Simon (31) have advocated a two-question test which may be helpful in this setting. The patient is asked to respond to the following questions: i) In the past month have you felt down, depressed or hopeless? ii) In the past month have you had little pleasure or interest in doing things? The test was found to be 96% sensitive but only 57% specific. For positive responses to both questions, referral to the psychiatry service for further evaluation is recommended. Simple screening tests such as this one may be valuable for preventing many of the complications associated with depressive co-morbidity in patients with cardiovascular disease.

From the present study, it is clear that depression is highly prevalent among patients with cardiovascular disease in Jamaica. This has implications for potentially serious health, emotional and financial consequences for patients, their families and the wider community. However, the risk of negative outcomes may be ameliorated by a multifactorial approach to the management of this often overlooked issue. Such a strategy would have to involve educating the patient, their family as well as all members of the healthcare team about the subtle and overt presentations of clinical depression. Improvement in social support systems for these patients suffering from depression is also imperative.

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