Ischaemic Heart Disease at the University Hospital of the West Indies: Trends in Hospital Admissions and Inpatient Mortality Rates 2005–2010

KA Mani¹, M Hoo Sang², NO Younger-Coleman³, TS Ferguson³

ABSTRACT

Objectives: This study aimed to estimate hospital admission rates and inpatient mortality rates for ischaemic heart disease (IHD) and its subtypes at the University Hospital of the West Indies (UHWI) for the years 2005–2010, and to identify factors associated with inpatient mortality.

Methods: Data from electronic discharge summaries for patients diagnosed with acute myocardial infarction (A-MI), unstable angina (UA) or other IHD were obtained from the Patient Information Management Systems database of the Medical Records Department of the UHWI. Data were entered into an electronic database and analysed using Stata 10.1. Random effects logistic regression was used to identify factors associated with inpatient mortality.

Results: Analysis included 3794 admissions (2821 persons: 1415 males, 1406 females; mean age 63.9 \pm 13.5 years). Overall admission rates for IHD were 12.1% (95% CI 11.7, 12.5) for medical admissions and 4.02% (95% CI 3.89, 4.15) for non-paediatric admissions. Admission rates were higher among males compared to females. There was a statistically significant trend for an overall increase in the rates for IHD admissions over the study period. Inpatient mortality rate was 18.9% for A-MI, 1.6% for UA and 7.8% for other IHD. In multivariable models, adjusted for age and gender, A-MI was associated with higher mortality compared to other IHD (OR 3.38, p < 0.001).

Conclusions: Ischaemic heart disease admission rate is increasing at the UHWI and accounts for approximately one of every eight medical admissions. Inpatient mortality for acute myocardial infarction is approximately 19%. Further studies are required to determine the factors associated with inpatient mortality and to inform strategies for improving outcomes.

Keywords: Developing countries, inpatient mortality, ischaemic heart disease, Jamaica, myocardial infarction, unstable angina

Cardiopatía Isquémica en el Hospital Universitario de West Indies: Tendencias de las Tasas de Ingresos Hospitalarios y las Tasas de Mortalidad entre los Pacientes Hospitalizados de 2005–2010

KA Mani¹, M Hoo Sang², NO Younger-Coleman³, TS Ferguson³

RESUMEN

Objetivos: Este estudio tuvo por objeto estimar las tasas de ingreso hospitalario y las tasas de mortalidad de los hospitalizados por cardiopatía isquémica (CI) y sus subtipos en el Hospital Universitario de West Indies (HUWI) en los años de 2005 a 2010, así como identificar los factores asociados con la mortalidad entre los pacientes hospitalizados.

Métodos: Se obtuvieron datos de los resúmenes electrónicos de altas de pacientes diagnosticados con infarto agudo de miocardio (IAM), angina inestable (AI) y otros tipos de isquemias. Los datos fueron obtenidos de la base de datos de los Sistemas de Gestión de la Información sobre los Pacientes del Departamento de Historias Clínicas de UHWI. Datos fueron introducidos en una base electrónica de datos, y analizados usando Stata 10.1. Para identificar los factores asociados con la mortalidad hospitalaria, se utilizó la regresión logística con efectos aleatorios.

From: ¹The University Hospital of the West Indies, Kingston 7, Jamaica, ²Department of Medicine, The University of the West Indies, Kingston 7, Jamaica and ³Tropical Medicine Research Institute (Epidemiology Research Unit), The University of the West Indies, Kingston 7, Jamaica.

Correspondence: Dr TS Ferguson, Tropical Medicine Research Institute, Epidemiology Research Unit, The University of the West Indies, Kingston 7, Jamaica. E-mail: trevor.ferguson02@uwimona.edu.jm **Resultados:** El análisis incluyó 3794 ingresos (2821 personas: 1415 hombres, 1406 mujeres; edad promedio: 63.9 ± 13.5 años). En general, las tarifas de ingreso para las CI fueron 12.1% (IC 95%: 11.7, 12.5) para los ingresos médicos, y 4.02% (IC 95%: 3.89, 4.15) para los ingresos no pediátricos. Las tasas de ingreso fueron mayores entre los varones en comparación con las hembras. Hubo una tendencia estadísticamente significativa a un aumento general en las tarifas de ingresos por CI en el periodo bajo estudio. La tasa de mortalidad entre pacientes hospitalizados fue 18.9% para el IAM, 1.6% para la AI, y 7.8% para otras CI. En los modelos multivariados, ajustados por edad y género, el IAM estuvo asociado con una mayor mortalidad en comparación con las otras CI. (OR 3.38, p < 0.001). **Conclusiones:** La tasa de ingreso por cardiopatías isquémicas está aumentando en el HUWI, y representa aproximadamente uno de cada ocho ingresos médicos. La mortalidad entre los ingresos a fin de determinar los factores asociados con la mortalidad entre los pacientes de ingreso, así como para hallar estrategias encaminadas a mejorar los resultados.

Palabras claves: Países en desarrollo, mortalidad entre pacientes ingresados, cardiopatía isquémica, Jamaica, infarto del miocardio, angina inestable

INTRODUCTION

Ischaemic heart disease (IHD) is one of the leading causes of death in Jamaica (1, 2). In 2004, IHD was the fourth leading cause of death among men and fifth leading cause among women, with gender-specific mortality rates of 40.4/100 000 in men and 39.6/100 000 in women (2). In 2009, IHD was the fifth leading cause of death among men and 4th leading cause of death among women (1). Data from the Jamaica Health and Lifestyle Survey 2007-2008 estimated that approximately 0.7% of Jamaicans (approximately 12 000 persons) have had a previous heart attack, with the highest prevalence of 2.6% among persons aged 55-74 years (3). These figures, however, represent only those who survive after having had a heart attack and therefore underestimate the true burden from IHD in Jamaica. Previous data from the University Hospital of the West Indies (UHWI), Jamaica's main teaching hospital, suggest relatively low rates of acute myocardial infarction but these data are over 40 years old (4-6).While hospital data suggested a relatively low incidence of IHD, community based studies suggested fairly high prevalence of angina pectoris and electrocardiographic abnormalities in a rural community survey (7, 8). More recent data indicate high prevalence of IHD risk factors such as hypertension, diabetes, dyslipidaemia and obesity in Jamaica and that the prevalence of some of these risk factors may be increasing (9). It is therefore likely that the burden of IHD may be increasing in Jamaica and, as such, studies are needed to evaluate whether this is so.

Ischaemic heart disease is associated with high mortality both pre-hospital, in-hospital and in the weeks following discharge from hospital (10, 11). Among patients hospitalized after heart attacks, inpatient mortality rates range between 10% and 15% in the United States of America (USA) and up to 27% in other countries (11). Community based studies suggest that overall, two-month mortality

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following myocardial infarction (MI) may be as high as 50% (11). In Jamaica, the studies done in the 1950s and 1960s show mortality rates of 27-37% among men and 37-46% among women (4, 6) but no recent data are available.

This study therefore aims to: (i) estimate the numbers and proportions of medical and non-paediatric admissions due to IHD at the UHWI for the years 2005–2010, (ii) evaluate secular trends in hospital admission rates, (iii) estimate inpatient mortality rates and (iv) identify factors associated with inpatient mortality.

SUBJECTS AND METHODS

We conducted a retrospective case series study, consisting of all patients with a discharge diagnosis of IHD, acute MI or unstable angina at the UHWI for the years 2005–2010. Data for the study were obtained in the form of the electronic discharge summary files from the Patient Information Management Systems database of the Medical Records Department of the UHWI. The study was approved by the University Hospital of the West Indies/University of the West Indies/Faculty of Medical Sciences Ethics Committee.

Discharge summary files were identified by searching the database using International Classification of Diseases 10th Revision (ICD 10) codes for all IHD categories (I20.0 – 125.9), including angina pectoris, acute MI, subsequent MI, complications following acute MI, other IHD and chronic IHD. The data were abstracted and entered into an electronic database using Microsoft Office Excel[®] and then imported into Stata[®] Statistics/Data Analysis software (StataCorp, College Station, Texas) for analysis. The total number of non-paediatric patients admitted to the UHWI and number of patients admitted to medical services for each year in the study period were obtained from the UHWI Medical Records Department and used as denominator data to compute proportional admission rates for each year.

Data analysis yielded frequency of IHD and its subtypes for each year within and across gender categories. Additionally, we obtained proportion of hospital admissions due to IHD and its subtypes (proportional admission rates) for total non-paediatric admissions and medical admissions, and the prevalence of co-morbid illnesses, such as diabetes, hypertension and heart failure among patients with IHD. We also computed overall inpatient mortality rates and evaluated factors associated with inpatient mortality using multivariable logistic regression. Estimates for prevalence of comorbidities and odds ratios for factors associated with mortality rates were computed using repeated measures random effects models to account for multiple admissions per person. Variables for inclusion in the random effects logistic regression model were selected based on associations found in the univariate analyses or an a priori hypothesized association. Variables were added sequentially and the likelihood ratio test used to decide on which variables should be kept in the final model.

In order to evaluate the validity of the electronic discharge summaries compared to direct review of the medical records, a random sample of 50 original patients' dockets were retrieved for comparative analysis. From these 50 dockets, we obtained data from 89 unique admissions. The kappa statistic was then used to evaluate the extent of agreement beyond chance for each admission being coded as having IHD or its subtypes, as well as having hypertension, diabetes mellitus or having died in hospital.

RESULTS

There were 3794 admissions with the diagnosis of IHD during the study period. These admissions involved a total of 2821 persons (1415 males and 1406 females). Patient characteristics at the time of admission are shown in Table 1.

Table 1: Characteristics of unique admissions for total sample and by gender

Characteristic	Total n = 3794	Male n = 1896	Female n = 1898
Age*** (years, mean ± SD)	63.9 ± 13.5	62.6 ± 13.1	65.3 ± 13.8
Length of stay* (days, mean ± SD)	7.3 ± 8.1	7.0 ± 6.9	7.6 ± 9.1
Length of stay* (days, median, p25 –p75)	5 (3-8)	5 (3-8)	6 (3-9)
Age category (%) < 40 years	2.6	3.0	2.2
40–49 years	13.6	14.7	12.5
60–69 years	26.2	23.4 27.4	24.9
$70-79$ years ≥ 80 years	22.8 13.3	20.8 10.8	24.9 15.8

* *p* < 0.05, ** *p* < 0.01, ****p* < 0.001

Mean age at admission was 63.9 ± 13.5 years with males being approximately three years younger than females at the time of admission (62.6 vs 65.3; p < 0.001). The majority of patients were 60 years or older. Median length of stay in hospital was five days with inter-quartile range of three days to eight days.

During the study period 2005–2010, there was a total of 100 635 admissions to the UHWI, of which 94 406 were non-paediatric admissions (*ie* total admission minus admissions to paediatric wards). Mean annual number of non-paediatric admission was 15 734 persons per year with a minimum of 15 080 admissions and a maximum of 16 698 admissions. There were 21 829 admissions to the medical services with mean of 3638 admissions per year (minimum of 3149 per year and maximum of 4496 per year). Acute myocardial infarctions accounted for 1187 admissions, unstable angina 1189 and other IHDs 1418. The majority of IHD admissions were managed by the General Medicine Service (Fig. 1). The mean annual number of admissions for



Fig. 1: Distribution of ischaemic heart disease admissions by service (medical team) responsible for management.

Gen Med = General Medicine; TTW = Tony Thwaites Wing (private ward at hospital); Cardio = Cardiology Service; Other Med = Other medical services; CTH = Cardiothoracic Surgery

acute myocardial infarctions was 198 ± 12 which accounted for 1.26% of non-paediatric admissions; for unstable angina, mean number of admissions was 198 ± 42 , also accounting for 1.26% of non-paediatric admissions, and for other IHD, it was 236 \pm 28 which accounted for 1.5% of non-paediatric admissions (Fig. 2). The combined number of admissions for all IHD was 440 \pm 49, representing 4.02% of non-paediatric admissions (Table 2).

Approximately 70% (2640 admissions) of all IHD admissions were to the medical services. Acute myocardial infarctions had a mean annual rate of 145 ± 13 for medical admissions, while unstable angina had a mean annual rate of



Fig. 2: Annual numbers of non-paediatric ischaemic heart disease (IHD) admissions by IHD category.

A-MI = acute myocardial infarction; UA = unstable angina; O-IHD = other ischaemic heart disease.

Mean number of admission for A-MI - 198 \pm 12; UA - 198 \pm 42; O-IHD - 236 \pm 28; all IHD - 440 \pm 49. Proportional non-paediatric admission rates for A-MI - 1.26%; UA - 1.26%; O-IHD - 1.5%; all IHD - 4.02%

 148 ± 35 medical admissions and other IHD had a mean annual rate of 147 ± 14 medical admissions (Fig. 3). Table 2 shows the proportion of medical admissions due to IHD and its subtypes within and across gender categories.



Fig. 3: Annual medical ischaemic heart disease (IHD) admissions by IHD category.

A-MI = acute myocardial infarction; UA = unstable angina; O-IHD = other ischaemic heart disease.

Overall, 2640 admissions were to the medical service, accounting for approximately 70% of total IHD admissions. Mean annual admission rate for A-MI – 145 ± 13 ; UA – 148 ± 35 ; O-IHD – 147 ± 14

Overall, IHD accounted for 12.1% of medical admissions with fairly equal distribution by subtypes. Proportional admission rates for all IHD, acute MI and other IHD were higher in males compared to females but there was no difference in the proportions for unstable angina.

 Table 2:
 Proportion of medical and non-paediatric admissions due to ischaemic heart disease and its subtypes for the total sample and by gender

Category	Total % (95% CI)	Male % (95% CI)	Female % (95% CI)	p (m:f diff) %
Medical admissions				
Acute MI	3.98 (3.73 - 4.25)	4.87 (4.42 - 5.30)	3.34 (3.03 - 3.65)	< 0.001
Unstable angina	4.07 (3.81 - 4.34)	4.12 (3.72 - 4.53)	4.04 (3.69 - 4.38)	0.746
Other IHD	4.04 (3.78 - 4.31)	4.55 (4.12 - 4.98)	3.67 (3.34 - 4.00)	< 0.001
All IHD	12.1 (11.7 – 12.5)	13.5 (12.8 – 14.3)	11.0 (10.5 – 11.6)	< 0.001
Total non-paediatric	admissions*			
Acute MI	1.26 (1.19 - 1.33)	1.94 (1.80-2.10)	0.89 (0.82–0.97)	< 0.001
Unstable angina	1.26 (1.19 – 1.33)	1.63 (1.50 - 1.78)	1.06 (0.98 - 1.15)	< 0.001
Other IHD	1.50 (1.1.42 - 1.58)	2.24 (2.08 - 2.40)	1.11 (1.03 - 1.20)	< 0.001
All IHD	4.02 (3.89 - 4.15)	5.81 (5.56 - 6.07)	3.07 (2.94 - 3.21)	< 0.001

MI = myocardial infarction; IHD = ischaemic heart disease

*When Obstetrics and Gynaecology admissions are excluded from the calculations for females, rates were 1.68% for MI, 2.0 for unstable angina, 2.09 for other IHD and 5.77 for all IHD, with *p*-value indicating a statistically significant difference for acute MI and unstable angina.

Secular trends for each of the IHD subtypes are shown in Fig. 4. There was evidence of a statistically significant



Fig. 4: Secular trends in medical ischaemic heart disease admissions 2005–2010.

A-MI = acute myocardial infarction; UA = unstable angina; O-IHD = other ischaemic heart disease.

The test for trend was also significant for all ischaemic heart disease combined (p < 0.001)

increasing trend in the proportional admission rates among medical admissions for all three IHD types and combined IHD. When expressed as a proportion for non-paediatric admissions, only unstable angina and combined IHD showed evidence for a statistically significant increasing trend (data not shown).

Table 3 shows the proportion of participants with hypertension, diabetes mellitus and heart failure as well as those undergoing cardiac catheterization and those who died in hospital. Overall, 32% had hypertension and 22% had diabetes mellitus. Both hypertension and diabetes mellitus were more common among women. Sixteen per cent had heart failure and 14% underwent cardiac catheterization. Heart failure was again more common among women but there was no difference in the rate of cardiac catheterization. Inpatient mortality rate for acute MI was 18.9%, with a higher rate among women (22.3% *vs* 16.0%; p < 0.05). Death was uncommon among those with unstable angina, with inpatient mortality rate of 1.6%, while for other IHD, inpatient mortality rate was 7.8%.

Random effects logistic regression was used to identify factors associated with inpatient mortality in order to account for the fact that some patients were admitted on more than one occasion. The results from the multivariable analysis are shown in Table 4. Acute MI was associated with a three-fold increase in the risk of death when compared to other IHD (OR 3.38; 95% CI 2.58, 4.43; p < 0.001). On the other hand, patients with unstable angina had significantly reduced odds of death compared to those with other IHD. Older age was associated with a 4% increase in the odds of death for each one-year increase in age. The only other factor associated with mortality was hypertension which showed a 39%

Table 3: Proportion of admissions with ischaemic heart disease comorbidities, cardiac catheterization and inpatient mortality rates for total sample and by gender

Category	Total %	Male %	Female %
Hypertension			
Acute MI**	28.4	24.5	32.8
Unstable angina	38.3	35.5	40.5
Other IHD**	27.3	24.0	30.7
All IHD***	32.1	28.1	35.9
Diabetes mellitus			
Acute MI*	20.3	16.2	24.9
Unstable angina	22.2	19.8	24.1
Other IHD**	22.3	19.1	25.5
All IHD***	22.2	18.8	25.6
Heart failure			
Acute MI*	14.3	12.0	16.9
Unstable angina***	10.1	5.5	14.0
Other IHD	20.9	19.7	22.1
All IHD***	16.2	13.8	18.5
Cardiac catheterization			
Acute MI	10.8	10.4	11.3
Unstable angina	13.6	12.7	14.3
Other IHD	14.5	13.3	15.7
All IHD	14.3	13.1	15.4
Deaths			
Acute MI*	18.9	16.0	22.3
Unstable angina	1.6	2.3	1.0
Other IHD	7.8	7.9	7.6
All IHD	10.8	10.3	11.3

MI = myocardial infarction; IHD = ischaemic heart disease

* p < 0.05, **p < 0.01, ***p < 0.001 for association by gender Estimates are adjusted to account for multiple admissions

 Table 4:
 Factors associated with death in multivariable logistic regression model*

Variable	Odds ratio	95%CI	<i>p</i> -value
Heart disease type (compared to other IHD)			
Unstable angina Acute MI	0.22 3.38	0.13, 0.39 2.58, 4.43	< 0.001 < 0.001
Gender (male/female)	0.95	0.74, 1.22	0.697
Age (per year)	1.04	1.03, 1.05	< 0.001
HTN (yes/no)	0.61	0.45, 0.83	0.002

MI = myocardial infarction; IHD = ischaemic heart disease; HTN = hypertension

*Random effects logistic regression (xtlogit) to account for repeated measures *ie* multiple admissions; estimates from a single model with all variables in the table.

decrease in the odds of death compared to persons who were not diagnosed as hypertensive.

Data for the validation sub-study is shown in Table 5. We found that there was good agreement between the

Variable	Observed agreement %	Expected agreement %	Kappa statistic	<i>p</i> -value
Gender	98.9	50.0	0.98	< 0.001
Any ischaemic heart disease	86.5	34.6	0.79	< 0.001
Acute myocardial infarction	88.8	52.2	0.77	< 0.001
Unstable angina	89.9	53.0	0.78	< 0.001
Diabetes mellitus	69.3	50.6	0.37	< 0.001
Hypertension	83.2	48.8	0.67	< 0.001
Death in hospital	96.5	82.4	0.80	< 0.001

Table 5: Agreement between electronic discharge summaries and manual chart review on sub-sample of 89 admissions from 50 medical charts

diagnoses recorded in the electronic discharge summaries when compared to direct review of medical records for the main diagnoses of IHD and its subtypes, with kappa ranging from 0.77 to 0.79. There was very good agreement in terms of recorded gender and in documenting deaths, kappa 0.98 and 0.80, respectively. Agreement was lower for diabetes mellitus and hypertension, which were the main co-morbidities assessed in this study, with kappa 0.37 for diabetes mellitus and 0.67 for hypertension. Of note, diabetes was recorded in 22% of discharge summaries compared to 49% of medical charts records while hypertension was recorded in 38% of discharge summaries compared to 55% of medical charts.

DISCUSSION

This study found that IHD accounted for 12% of medical admissions and 4% of non-paediatric admissions at the UHWI during the period 2005–2010, with approximately one-third of the cases being due to acute MI. There was a trend for an increasing proportion of admissions due to IHD during the study period. Inpatient mortality due to acute MI was approximately 19%, which was more than twice the inpatient mortality rate due to other IHD, and more than ten times the mortality associated with unstable angina. Age and a diagnosis of acute MI were positively associated with IHD mortality while recorded hypertension was inversely associated with mortality.

Our data suggest that the admission rates for IHD at the UHWI have increased compared to previously published reports (4–6). In an analysis of data from UHWI between 1952 and 1958, Tulloch reported 84 admissions for acute MI or old MI during the five and a half-year period, with an overall admission rate of 1.6% of medical admissions (5). Ashcroft and Stuart reported 111 cases of acute MI at the UHWI during the three-year period 1968–1970, but the number of medical admissions during the period was not recorded (6). When these reports are compared to our data, we see that there has been a marked increase in both the number and proportion of patients for acute MI and overall ischaemic heart disease, with overall IHD admissions of 12.1% in our study compared to 1.6% in Tulloch's study. In

our study, the mean number of acute MI admissions to the medical service was 148 per year compared to the 84 over the five and a half years reported by Tulloch and 111 over three years reported by Ashcroft and Stuart. In all three studies, there were more men than women, with men tending to have IHD admissions at younger ages than females.

With regards to the inpatient mortality rate associated with acute MI, there appears to be a large reduction in mortality in this study compared to the previous two studies. In Tulloch's study (4), mortality rate for acute MI during the 1952 to 1958 period was 45%, while Ashcroft and Stuart (6) reported mortality of 35%. The 19% inpatient mortality for acute MI in this study therefore suggests that there has been a marked reduction in mortality rates due to acute MI at the UHWI over the last three to four decades. This reduction in mortality is consistent with that seen internationally over the past four to five decades. In one meta-analysis, in-hospital mortality associated with acute MI decreased from 29% in the 1960s to 21% in the 1970s and to 16% in the 1980s (12). In a more recent paper from the USA, in-hospital mortality among patients with a discharge diagnosis of acute MI decreased from 14.6% in 1995 to 10.1% in 2006 (13). A similar in-hospital mortality rate of 10.6% was reported in a study among five hospitals in Egypt during the years 2009-2010, while in a study from Greece, mortality among hospitals with available cardiac catheterization laboratory was 6.5% compared to 8.3% in hospitals without one (14, 15). These data suggest that while in-hospital mortality from ischaemic heart disease in Jamaica may be decreasing, the overall mortality rates are still relatively high when compared to other countries. With regard to other Caribbean countries, it is difficult to make clear comparisons as data are extremely limited. In one study, Wattley reported mortality from ischaemic heart disease in Trinidad for the year 1957 at approximately 43% (16) while data from the St James study, also in Trinidad, reported mortality rates ranging from 25-60% for first coronary events (17). There is a clear need for more research on ischaemic heart disease in the Caribbean, especially as it remains a leading cause of death in the region (2).

Factors associated with increased mortality in this study were a diagnosis of acute MI and older age, while having a diagnosis of hypertension was inversely associated with mortality. The association between age and risk of death among patients with acute MI is well established (18–21). The inverse association with hypertension in this study appears counterintuitive, but while studies generally report an increased mortality risk with a history of hypertension, lower systolic blood pressure and diastolic blood pressure are associated with higher mortality (19–21). It is likely that a recorded diagnosis of hypertension on the discharge summaries in this study may be indicative of blood pressure level during the admission and not whether the patient had a prior history of hypertension, thus explaining the inverse association between

diabetes mellitus and mortality in this study may also be related to under-recording of diabetes on the discharge summaries.

Limitations and strengths of this study include the following: the study was based on data from discharge summaries and as such we were unable to independently verify that diagnosis of IHD or the subtypes fulfilled standard criteria. However, we were able to assess the levels of agreement between diagnoses recorded in the discharge summaries and actual medical records in a subset of the study sample and found that there was generally good or very good agreement. According to Fleiss and colleagues, kappa > 0.75represents excellent agreement, while values ranging from 0.4 to 0.75 indicate moderate agreement and values below 0.4 represents poor agreement (22). In our study, the kappa statistic was > 0.75 for IHD and its subtypes and also for deaths. We are therefore confident that the results reflect the patterns of IHD admission at UHWI. We are also unable to generalize the findings to all of Jamaica because the study was also limited to data from a single hospital. These data are, however, the first reports on hospital admission rates and inpatient mortality in Jamaica for almost forty years and therefore represent a significant addition to the literature. It is imperative that further studies evaluating the burden of IHD in Jamaica and other developing countries be conducted so that appropriate measures can be taken to reduce risk and improve outcome.

CONCLUSIONS

Ischaemic heart disease remains a major cause of hospitalization in this Jamaican setting and proportional admission rates are still increasing. While inpatient mortality rates have improved compared to previous studies, they remain higher than reported in several other countries. Further studies are therefore needed to identify factors contributing to this increasing burden of IHD and whether this is reflective of the Jamaican population as a whole. It will also be necessary to better identify factors associated with increased mortality in this setting in order to design appropriate interventions and to improve outcomes.

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