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Systolic blood pressure on admission, clinical characteristics and mortality in patients hospitalised for acute coronary syndrome at Charlotte Maxeke Johannesburg Academic Hospital

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Systolic Blood Pressure on Admission, Clinical Characteristics and Mortality in Patients Hospitalised for Acute Coronary Syndrome at Charlotte Maxeke Johannesburg Academic Hospital.

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A dissertation submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Master of Science in Medicine

Johannesburg, 2014

DECLARATION

I, Muhammad Nazir Shehu, hereby declare that this dissertation is my own work. It is being submitted for the degree of the Master of Science in Medicine in the division of Cardiology University of Witwatersrand, Johannesburg. It has not been submitted for any degree at this or any other university before.

Signature:  Date: 14-10-2014

DEDICATION

I dedicate this work to my late father, Alhaji Muhammad Abua, to my mother, Hajiya Hasiya Muhammad, to my late grandfather, Alhaji Shehu Kurfi and to my late uncle, as well as guardian, Alhaji Sirajo Shehu, for their support and assistance in my career.

ABSTRACT

INTRODUCTION

Ischaemic heart disease has been regarded as one of the most common causes of hospital admission and mortality worldwide. In Africa, it has been estimated as the eighth most common cause of death, a continent that was previously said to have immunity from the disease. In order to make an informed decision with regard to the appropriate and necessary therapy for patients presenting with acute coronary syndrome (ACS), an assessment of common and easily identifiable poor prognostic factors of the disease is advocated. Studies done mostly outside Africa have identified the clinical parameters such as: increased heart rate and lower systolic blood pressure on admission among others as poor prognostic factors of mortality among patients admitted with ACS. This study aimed to determine the relationship of SBP on admission, clinical characteristics and mortality among patients admitted with ACS at Charlotte Maxeke Johannesburg Academic Hospital (CMJAH).

METHODS

Patients aged 18 years and above admitted at the Cardiology Division CMJAH, with the diagnosis of ACS between the period of January 2010 and December 2012 were recruited for this study. All data with regard to clinical characteristics, investigations, medical as well as interventional therapies done to the patients were obtained from the database unit of the Cardiology Division. Those patients with missing information from the database had their record retrieved from the main Records department of the hospital. Patients were classified into 4 quartiles based on admitting systolic blood pressure (SBP) as follows: SBP <100mmHg, SBP 100-129mmHg (Normal), SBP 130-139 mmHg (pre-hypertension) and SBP ≥140mmHg (hypertension).

RESULTS

A total of 658 consecutive patients with the diagnosis of ACS admitted to the cardiology division of CMJAH were recruited during the two-and-half year study period with a prevalence of 21.8%. However, only 613 patients had completed data retrieved from their records and were used for this study. The patients consisted of 451 males (73.6%) and 162 females (26.4%), with male-to-female ratio of 2.8:1. The mean age of patients in this study was 58.88 ±12.52, with the mean age of 57.39±11.96 and 63.01±12.62 for male and female respectively. Females were significantly older than males in this study ($p < 0.0001$). Four racial groups consisting of Black, Coloured, White and Indian were identified from the study. The White group dominated the racial groups with 334 patients (55%) followed by Black group with 134 patients (22%).

Patients who presented with higher SBP on admission were more likely to be smokers, hypertensives and had higher serum lipid. Those with SBP <100mmHg had significantly higher frequency of Killip class ≥3 and higher mean heart rate. Admitting SBP was not significantly different among the 4 racial groups, gender and presenting age.

Of the 613 patients, 27 died, contributing a mortality rate of 4.4%. After multiple logistic regression analysis, patients with SBP ≤100mmHg and those >65years of age had more than 2/double the times risk of death compared to others. The risk of death was more than 4 to 5 fold higher among those with Killip class 3-4 and those in atrial fibrillation (AF) respectively. Those with heart rate (HR) ≥96bpm and Haemoglobin (Hb) level of <11.4mg/dl had more than 2 and 4 times risk of death respectively. On the other hand, those that received higher number of drugs, with a proven medical benefit (Optimal medical therapy) had a better chance of survival compared to those who did not receive such optimal medical therapy.

CONCLUSION

In this study, there were more male than female, with females being significantly older. Patients who presented with lower SBP levels were more likely to be in higher Killip class and had higher mean heart rate, while those with higher SBP levels were more likely to be hypertensives, smokers and had higher serum lipid levels. Lower SBP, advanced age, higher Killip class, AF, higher HR and lower Hb level were found to be positive predictors of mortality, while optimal medical therapy was positive predictor of survival.

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LIST OF ABBREVIATIONS

ACC	American College of Cardiology
ACE-I	Angiotensin converting enzyme inhibitors.
ACS	Acute coronary syndrome
AF	Atrial fibrillation
AHA	American Heart Association
AIDS	Acquired immune deficiency syndrome
AMI	Acute myocardial infarction
AO	Aorta
ARBs	Angiotensin receptor blockers
BMI	Body mass index
BNP	Brain natriuretic peptide
BUN	Blood urea Nitrogen
CABG	Coronary artery bypass graft
CAD	Coronary artery disease
CCS	Canadian Cardiovascular Society
CCU	Coronary care unit
CHD	Coronary heart disease
CK-MB	Creatinine kinase myocardial band
CMJAH	Charlotte Maxeke Academic Hospital
COX-2	Cyclo-oxygenase inhibitors
CRP	C-reactive protein
cTnI	Cardiac troponin I
cTnT	Cardiac troponin T

CVD	Cardiovascular disease
DM	Diabetes mellitus
ECG	Electrocardiography
EF	Ejection fraction
ECS	European Society of Cardiology
EUCR	Electrolyte urea and creatinine
FPG	Fasting plasma glucose
Hb	Haemoglobin
HDL	High density lipoprotein cholesterol
HF	Heart failure
HR	Heart rate
HTN	Hypertension
INR	International normalize ratio
IV	Intravenous
IVSDd	Interventricular septal diameter in diastole
IVSDs	Interventricular septal diameter in systole
JVP	Jugular venous pressure
LA	left atrium
LAD	Left anterior descending artery
LDL	Low density lipoprotein cholesterol
LCx	Left circumflex artery
LMT	Left main truck coronary artery
LVIDd	Left ventricular internal diameter in diastole
LVIDs	Left ventricular internal diameter in systole
LVPWDd	Left ventricular posterior diameter in diastole

LVPWDs	Left ventricular posterior diameter in systole
MI	Myocardial infarction
NSAID	Non steroidal anti inflammatory drugs
NSTEMI	Non ST-segment elevation myocardial infarction
PCI	Percutaneous coronary intervention
RCA	Right coronary artery
SBP	Systolic blood pressure
SCr	Serum creatinine
SPSS	Statistical package for social sciences
SSA	Sub-Saharan Africa
STEMI	ST-segment elevation myocardial infarction
TC	Total cholesterol
TIMI	Thrombolysis in myocardial infarction
UK	United Kingdom
US	United States
USSR	United Soviet States of Russia
VF	Ventricular fibrillation
VT	Ventricular tachycardia
WBC	White blood cell count
WHO	World health organization