OPEN ACCESS

Saudi Journal of Medicine

Abbreviated Key Title: Saudi J Med
ISSN 2518-3389 (Print) |ISSN 2518-3397 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Association of Arterial Hypertension with Acute Myocardial Infarction among Iraqi Patients

Shwan O. Amen[1], Banan Q. Rasool[2*], Soza Th. Baban[3]

[1]Consultant Interventional Cardiologist, Surgical Specialty Hospital - Cardiac Center, Erbil, Iraq
[2]Junior House Officer, Erbil Teaching Hospital, Erbil, Iraq
[3]Biomolecular medical scientist, Medical laboratory, Surgical Specialty Hospital- Cardiac center, Erbil, Iraq

DOI: 10.36348/sjm.2021.v06i02.003 | **Received:** 11.02.2021 | **Accepted:** 23.02.2021 | **Published:** 27.02.2021

***Corresponding Author:** Banan Q. Rasool

Abstract

Background: Acute Myocardial Infarction (AMI) is the most prevalent serious cause of morbidity and loss of quality of life worldwide despite current advances in primary preventive and state-of-the art interventional strategies for effective AMI treatment. Hypertension is the major contributor to atherosclerosis and which in turn leads to progression of AMI. Little is known about the prevalence of hypertension in AMI patients among Iraqi population. ***Objectives:*** The aim of this study was to assess the prevalence of Hypertension in AMI patients in relation to age and gender in Iraqi population. ***Methods:*** This study focused on 74 consecutive Iraqi patients diagnosed with AMI aged 22-85 years. ***Results:*** Findings of this study showed that hypertension was present in 74.3% of AMI patients. The prevalence of hypertension was significantly higher in females (46.7%) as compared to male patients (20.5%) at age group of 50-59 years. Furthermore, results showed that 37 hypertensive AMI patients (67.3%) had high-normal arterial hypertension, followed by 11 (20%) as isolated systolic arterial hypertension, 4 (7.3%) as Grade-1 arterial hypertension, 2 (3.6%) as Grade-2 arterial hypertension, and 1 (1.8%) as Grade-3 arterial hypertension level. ***Conclusions:*** These findings confirm that hypertension varied in age and gender in AMI patients among Iraqi Population. Hypertension was significantly more prevalent in older female patients with AMI when compared to male patients. The High normal of hypertension was the most prevalent type among AMI patients.

Keywords: Acute Myocardial Infarction, Arterial hypertension, preventive cardiovascular.

INTRODUCTION

Worldwide, Acute Myocardial Infarction (AMI) is the most prevalent serious cause of morbidity and loss of quality of life [1]. It is the major manifestation of atherosclerotic coronary artery disease (CAD). AMI is attributed to rupture atherosclerotic plaques and lead to thrombosis, and decreasing blood flow in the coronary [2]. Arterial hypertension is an important predisposing factor for heightening the risk of developing acute coronary artery disease and affecting particularly the middle-aged and older populations worldwide [3, 4]. Arterial hypertension is regarded as one of the main factors leading to atherogenesis and the development of atherogenic plaques which in turn results in thrombosis or vascular rupture and leads to develop AMI.

Its prevalence is progressively on rise with age in both genders and its effective treatment remains challenging, highlighting the need for preventive program. It has been shown that prevalence of hypertension varies in different ethnic populations, as it is higher in blacks at all ages in comparison to whites [5]. The prevalence of hypertension ranges between 28% to 44% across North America and Europe [6].

The question of the prevalence of Hypertension in AMI patients is not known in Iraqi population. Studies in various cities of Iraq and internationally have showed various prevalence pattern of hypertension for CAD events. The major aims of this study are, to determine, among Iraqi population, the association of arterial Hypertension with increasing the risk of developing AMI in patients and to determine the prevalence of Arterial Hypertension in these patients in relation to age and gender.

MATERIALS AND METHODS

Study population

The study population comprised 74 consecutive patients with acute MI, admitted to the causality department of the Surgical Specialty Hospital

– Cardiac center within 12 hours of clinical signs and symptoms onset during the period from March to September 2018. All patients between 20 to 90 years old were included in this study. Diagnostic criteria of AMI were followed according to the guidelines of European Society of Cardiology, such as when the patient is presented with typical chest pain, diagnostic ECG changes, and a significant elevation of cardiac enzymes. Exclusion criteria for patients and controls included pregnancy, anemia, and Renal failure. The demographic data of the patients including age, gender, education, location of residence, and individual, clinical, and laboratory cardiovascular risk factors such as the date at MI incidence, duration of hospitalization, diabetes, arterial hypertension, smoking, dyslipidemia, type of diagnosis were gathered. According to the 2018 ESC/ESH Guidelines for the management of arterial hypertension [7], the definition and classification of arterial hypertension is followed in this study as described in Table 1.

STATISTICAL ANALYSIS OF DATA

Data results of this study were analysed using the statistical package for social sciences (SPSS, version 19). Differences in variables were tested using Student's t-tests. A *P*-value of ≤0.05 was considered as statistically significant.

Ethical Consideration

This study was approved by the Ethics Committee of Hawler Medical University, and written informed consent was obtained from all patients. Cases filled in a standard questionnaire about their personal histories, major risk factors, history of ischemic heart disease, and provided blood samples for laboratory analysis.

RESULTS

In this study, a total of 74 consecutive patients presenting with AMI, of which 23 (31.1%) female and 51 (68.9%) male, were enrolled. The mean ± SD of AMI patients age was 55.5 ±12.47 ranged between 22 to 83 years. Mean ± SD of age was 55.4 ± 14.2 years in male and 57.1 ± 9.3 in female patients. Results showed that 55 (74.3%) of patients with AMI were hypertensive, 3 (4.1%) hypotensive and 16 (21.6%) had normal blood pressure, as shown in Figure 1. Among the AMI patients in this study, the prevalence of high arterial blood pressure was greater among male patients (76.5%) than among female patients (69.6%), as shown in Figure 2. The prevalence of arterial hypertension of different age groups was determined. As shown in Figure 3, the highest prevalence of arterial hypertension was seen in elderly patients at 60-69 years of age (30.9%). This difference was statistically significant (p <0.001). The highest prevalence rate of arterial hypertension was observed in female patients at 50-59 years of age, while in male patients was detected at 60-69 years of age, as shown in Figure 4. Furthermore, results showed that 37 hypertensive AMI patients (67.3%) had high-normal arterial hypertension, followed by 11 (20%) as Isolated Systolic Arterial Hypertension, 4 (7.3%) as Grade-1 Arterial Hypertension, 2 (3.6%) as Grade-2 Arterial Hypertension and 1 (1.8%) as Grade-3 Arterial Hypertension levels, as shown in Figure 5.

Table-1: Classification of arterial blood pressure[a] and definitions of hypertension grades[b]

Category	Systolic (mmHg)	Diastolic (mmHg)
Optimal	<120	and <80
Normal	120–129	and/or 80–84
High normal	130–139	and/or 85–89
Grade 1 hypertension	140–159	and/or 90–99
Grade 2 hypertension	160–179	and/or 100–109
Grade 3 hypertension	≥180	and/or ≥110
Isolated systolic hypertension[b]	≥140	and <90

BP = blood pressure; SBP = systolic blood pressure.

[a] BP category is defined according to seated clinic BP and by the highest level of BP, whether systolic or diastolic.

[b] Isolated systolic hypertension is graded 1, 2, or 3 according to SBP values in the ranges indicated.

This figure shows that 74.3% of all the patients of AMI had arterial Hypertension.

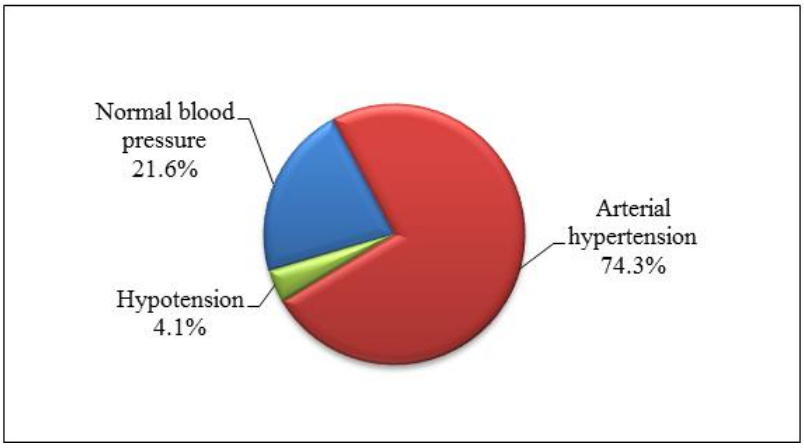

Fig-1: Prevalence of blood pressure in AMI patients

This figure shows that the prevalence of Arterial hypertension was higher in male patients (76.5%) than in female patients (69.6%) AMI = Acute myocardial Infarction

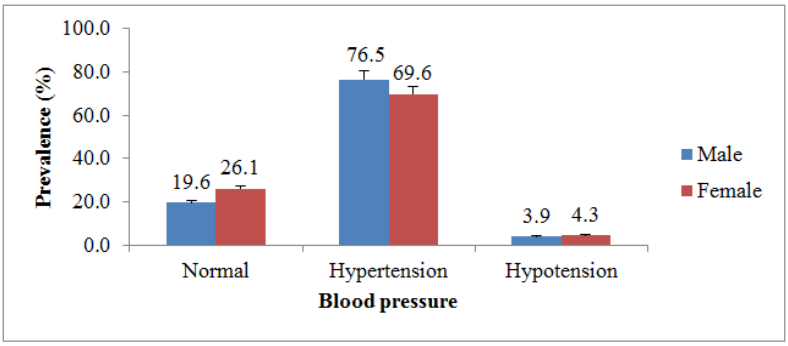

Fig-2: Prevalence of blood pressure in AMI patients in relation to gender

This figure shows that majority of AMI patients with atrial Hypertension are within age age group of 60-69 years.

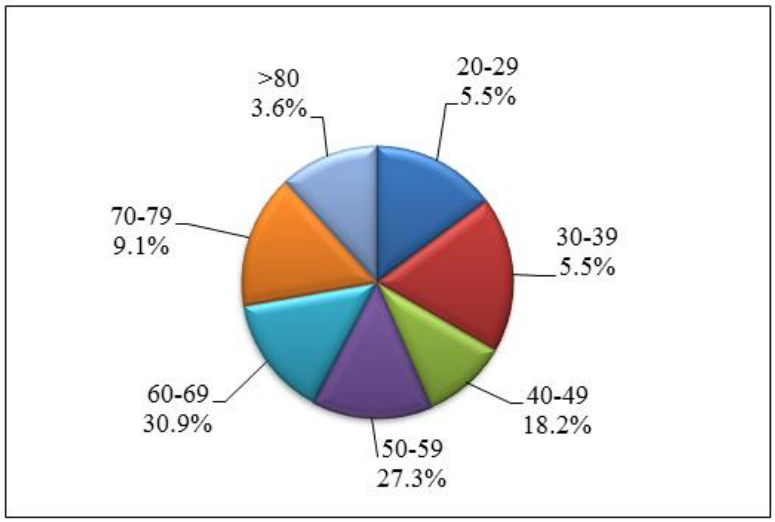

Fig-3: Prevalence of arterial hypertension in AMI patients in relation to age

This figure shows that female patients among age group of 50-59, 40-49 and 70-79 years, are having higher prevalence of Arterial hypertension comparing to Male patients. While in the remaining age groups males are having higher prevalence of Arterial Hypertension.

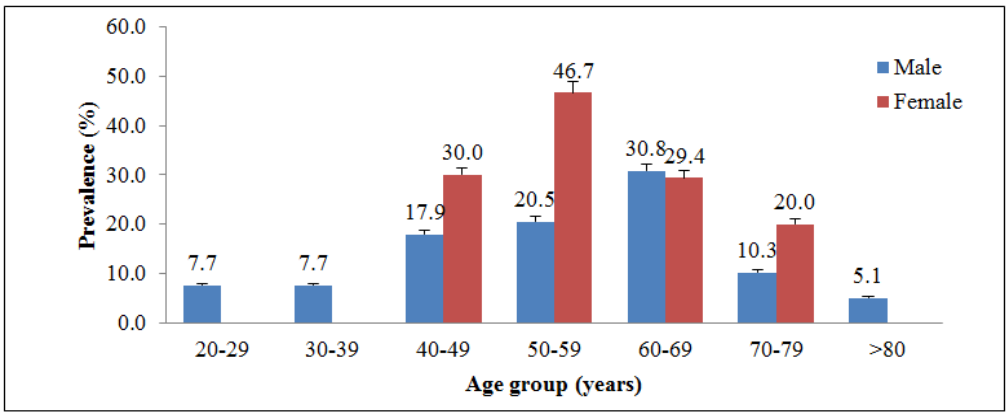

Fig-4: Prevalence of blood pressure in AMI patients in relation to age and gender

This figure shows that 20% of all the patients with AMI had Isolated Systolic Hypertension, and 67.3% of them had High-Normal Blood Pressure readings.

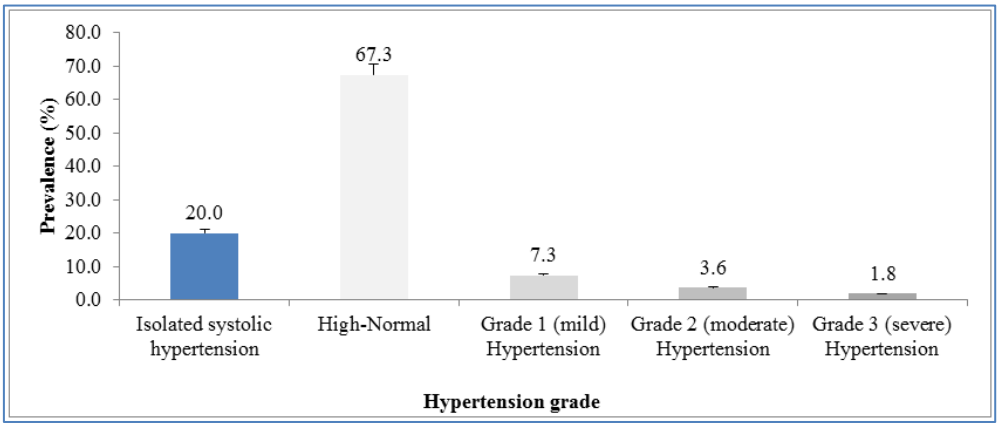

Fig-5: Prevalence of arterial hypertension types among patients with AMI

DISCUSSION

High Arterial blood pressure is a major health problem that significantly associated with an increasing risk of AMI. The systolic and diastolic arterial hypertension are associated with risk of AMI and the higher the blood pressure, the greater the risk [8]. The prevalence of arterial hypertension is considered as the second highest in the Eastern Mediterranean countries [9]. In old age, arterial hypertension has a deleterious effect on the heart in older patients and responsible for about 70% of heart disease [10]. Several mechanisms can account for the increased coronary risk in hypertensive patients. Arterial hypertension accelerates the effects on atheroma, increases shear stress on plaques, exerts adverse functional effects on the coronary circulation, and impairs endothelial function and control of sympathetic tone [7]. The present study reported the current status of arterial hypertension incidence in patients with AMI in relation to age and gender for the first time among Iraqi population though hospital-based study. Our study showed an alarming high prevalence rate of arterial hypertension (74.3%) among AMI patients. The prevalence of Arterial hypertension in Iraqi patients with CAD was higher (74.3%) as compared to recent studies conducted across different regions in Iraq in 2014 (47.9%) in Baghdad [11], and in 2015 (46%) in Duhok [12]. Although recent studies conducted confirm the association between arterial hypertension and CAD in general, it is clear that differences exist between populations on the incidence and impact of arterial hypertension in AMI patients around the globe, as reported in few studies [13-15]. More recently, the Spanish registry (PRIMVAC) showed a 46% prevalence of arterial hypertension in patients undergoing coronary angiography [16]. Similarly, 46.3% of ACS patients had high arterial blood pressure among Lebanese population [17]. Furthermore, a Turkish cohort study revealed lower percentage of hypertensive patients with AMI (37.7%) of patients among Turkish population [18]. Arterial hypertension was reported as a main risk factor in the elderly patients with CAD in a large study in Germany [19]. In Pakistan, low prevalence of hypertension (37.75%) was recently reported [20]. There is increasing evidence that gender influences blood pressure and the present study showed a significant higher AMI female patients prevalence rate of arterial hypertension as compared to male patients. This result was in agreement of recent studies [21, 22]. In the line of these findings, this study confirms that arterial hypertension is an important major risk factor for AMI in Iraqi population.

CONCLUSIONS

The findings of this study confirm an alarming high prevalence of Arterial Hypertension and its strong association with increasing risk of AMI among Iraqi patients. Furthermore, this study emphasizes the variability in the rate of abnormal lipid profile in age- and gender subgroups of patients with AMI. Alarmingly, 81% of patients had abnormal lipid profile in Iraqi population. This study confirms that the LDL-C level as the primary target for high blood cholesterol therapy.

This study shed the light on for primary prevention and control of this risk factor for AMI through healthy lifestyle, increased physical activity, and healthy dietary choices can reduce the prevalence of AMI.

ACKNOWLEDGMENT

We would like to thank all the people who played an important role in accomplishing this work. We would like to appreciate the staff of SSH-Cardiac Centre who was supportive in collecting the data.

Study Limitations

Our study had some limitations within which some of the consecutive patients had to be excluded from the population because of some missing data.

Secondly, the data was all from a single center and not all the patients from local center, so due to it is sample size it can't be generalized.

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