



## Prevalence of Diabetes and Hypertension amongst patients admitted with Acute Myocardial Infarction to Ibn-Sina Teaching Hospital

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### DOI

### ABSTRACT

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Coronary heart disease (CHD) is a leading cause of morbidity and mortality worldwide. Acute Myocardial Infarction (AMI) is the most common form of CHD and is responsible for over 15% of mortality every year. Hypertension (HTN) and diabetes mellitus (DM) are thought to be the most significant risk factors for developing CHD. Old age is a risk factor in both genders. However, Younger female are less likely to be affected compared to males. This study aims to assess the prevalence of HTN, DM, or both amongst patients admitted with acute MI (AMI) and to demonstrate the distribution of AMI according to age group and gender. Comorbidity data from 36 patients (22 males and 14 females) admitted with AMI to Ibn-Sina hospital between January 2018 and December 2018 was analyzed, tabulated, and graphed using Microsoft Excel. Our results showed that 8 patients (22.2%) had HTN prior to admission and 6 patients (16.6%) had DM, whilst 16 patients (44.4%) had both HTN and DM. 6 patients (16.6%) had neither HTN or DM. Male patients had the highest incidence of AMIs (22 patients, 62.5%). Furthermore, the highest incidence of AMIs in male patients were in the '40-59' age group, as compared with the female group with the highest incidence of AMIs being in the '60-69' age group. A combined co-morbidity of HTN and DM was shown to be a high-risk factor for the incidence of MI. Furthermore, MI incidence was shown to be higher in the male population, and presents at a younger age in males than females.

### 1.0 Introduction

Myocardial infarction (MI) is one of the leading causes of mortality for both men and women worldwide. (Kosuge and Kimura, 2006) Only 50% of those who suffer with MI survive the acute event, with a 10% mortality on admission, and 10% mortality in the following two years. (Parveen and Michael, 2016). An MI is classed as 'non-fatal' in patients who are discharged from hospital alive. (Brady and Perron, 2011)

Known important risk factors for MI include: previous cardiovascular disease (such as angina, a previous heart attack or stroke), older age (especially men over 40 and women over 50), tobacco smoking, high blood levels of certain lipids (Triglycerides, Cholesterol), diabetes (DM), hypertension (HTN), obesity, family history of ischemic heart disease (IHD). (Baxel et al, 2016) An MI diagnosis is made by using a combination of the patient's history of

presenting illness, a physical examination, electrocardiogram (ECG) findings, and the presence of certain cardiac markers. (Distinctions are made between ST-elevated MI (STEMI) or non-ST-elevated MI (NSTEMI) on the basis of the patient's ECG. STEMI can be further sub-classified into: anterior, posterior, or inferior. (Brady and Perron, 2011)

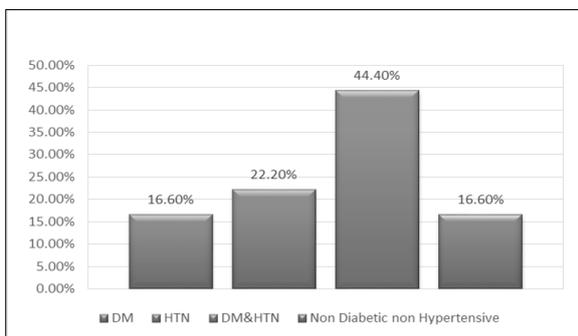
The risk of developing an MI significantly decreases with strict blood pressure management and lifestyle changes, including: smoking cessation, regular exercise, and diet management. In our study we assessed the prevalence of the most significant risk factors for developing an acute MI (AMI) in this new population, analyzed and compared incidence amongst the different genders, and in different age groups.

**2.0 Materials and Methods**

The participants of this research were chosen from Iben-Sina teaching hospital, a public hospital, serves around 158.747 population, with 50 beds, including a 6-bed coronary-care unit (CCU). Patients with complete past medical histories presenting with signs and symptoms consistent with a diagnosis of AMI were selected for this analysis. This included: a history of chest pain consistent with AMI, ECG changes consistent with AMI, and a rise in serum cardiac enzymes (including troponin, creatinine kinase (CK), creatinine phosphokinase-MB (CK-MB), and lactate dehydrogenase (LDH). A total of 36 patients with MI (22 males and 14 females) were identified in the period from January 2018 to December 2018 and included in the analysis. The patients with HTN and/or DM status, genders, and ages were then collected before being analyzed, tabulated, and graphed using Microsoft Excel

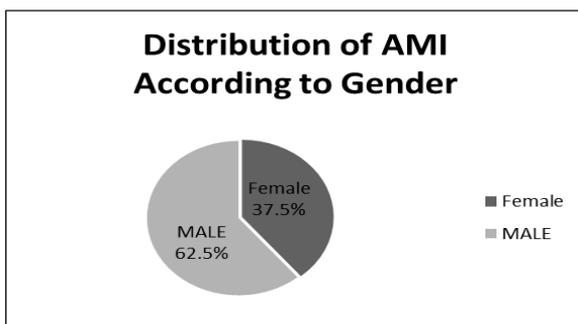
**3.0 Results**

From a total of 36 patients chosen for the study, 22 were male (62.5%) and 14 were female (37.5%). A total of 8 patients (22.2%) had HTN prior to admission, 6 patients (16.6%) had DM, and 16 patients (44.4%) had both HTN and DM. 6 patients (16.6%) had neither HTN nor DM. The result shown in Figure1.



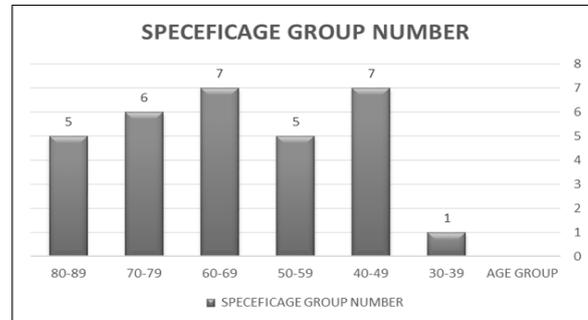
**Figure 1. Distribution of HTN and Diabetes amongst AMI patients**

Male patients had a higher incidence of AMIs (22 patients, 62.5%) compared to female patients (14 patients, 37.5%). The result represented in figure 2



**Figure 2. Distribution of AMI according to gender.**

The highest incidence of AMIs in male patients was in the '40-59' age group (n=12, 54.5%), while the female group with the highest incidence of AMIs was in the '60-69' age group (n=7, 50%). Figure 3 illustrates the distribution of cases according to the age group.



**Figure 3** illustrates the distribution of cases according to the age group.

**4.0 Discussion**

The variation in prevalence of risk factors for AMI between populations is influenced by genetic and lifestyle factors. (Wilkinson P et al. 2009). Prior cardiovascular disease, age, smoking, high levels of certain lipids, diabetes, hypertension, obesity, and family history of ischemic heart disease are all known risk factors for AMI. (Abdulrazag and Mohamed et al, 2019). This observational study aimed to investigate the prevalence of comorbid DM, HTN, and both amongst patients admitted with AMI. Our results showed that 16 patients (44.4%) had both DM and HTN, a similar finding to previous studies. (Abn D etal.2017). The second most common risk factor was HTN, identified in 8 patients (22.2%), whilst the prevalence of DM and neither risk factors was found in 8 patients (16.6%). This is in contrast to a previous study conducted at Zlitan Teaching Hospital, which found a prevalence of 33.3% for patients with DM and HTN. (Abdulrazag and Mohamed et al, 2019).

Another study conducted in Saudi Arabia showed a HTN prevalence of 47.5% amongst AMI patients. (Amjad, Ahmad and Walid at al, 2017), which is nearly a similar result to our study (42.7%). Regarding the risk factors 71.2% of AMI patients in Tikur have previous history of hypertension, 35.9% have had DM and 33.1% have previous history of MI, but according to the study done in Nepal in which 27.8% of AMI patients were hypertensive and 15.65% were DM patients. (Tamrakar, R., Bhatt, Y. D., Kansakar, S.et al, 2014)

The Kenyan study also reflects the same finding as hypertension and DM were the leading risk factors for AMI. (PM Chege et al, 2016)

Our study showed a higher frequency of AMI in males than females. This is consistent with findings of other similar studies, including one conducted in Ethiopia including admissions from October to December 2007. (Solomon and Fessahaye, 2010)] and another done in

Saudi Arabia in which 86.6% of AMI patients were male (Male to female ratio 6.4:1). (Amjad, Ahmad and Walid at al, 2017). These results are similar to studies in other Arab countries, but are higher in comparison to those conducted in populations of developed countries. Furthermore, premenopausal women have shown to have a lower incidence of CHD than that of aged-matched men.

This study found highlighted the fact that AMI is a disease of middle and old age. Patients with AMI below the age of 40 were mostly males, in comparison to female patients who represented more in older age groups (>50). A study conducted in Egypt revealed a significantly higher prevalence of AMI in males compared to females among age groups less than 55 years, on the contrary it rises sharply in females in age groups >55 years. (Reda, A. Bendary, A. Elbahry, A et al. 2021)

## 5.0 Conclusion

Our study shown that combined hypertension and diabetes associated with a high risk for AMI. Males are more commonly affected. However, Male patients represented at a younger age compared to females. This study provides valuable insights into the prevalence of risk factors for AMI, which can help guide the management and prevention of this disease

## References

- Abdulrazag F. Mohamed, Mohamed S Fayed, Majda H et al. (2019) "Retrospective study among Primary care type 2 Diabetes Mellitus Patients within the city of Zliten, Libya, Libyan Journal of Medical Sciences - DOI: 10.4103/LJMS.LJMS\_60\_18
- Abn D et al. (2017) "Smoking as a risk factor for cardiovascular diseases", National Journal of Research in Community Medicine, 6, pp, 4-6
- AM Ahmed, A Hersi, W Mshoud, MR, Arafah. 2017 "Cardiovascular Epidemiological (ACE) study, Journal of the Saudi Heart Association 29(4), pp, 235-243
- Alhassan SM, Ahmed HG, Almutlaq BA, Alanqari AA, Alshammari RK, et al. (2017) "Risk Factors Associated with Acute Coronary Syndrome in Northern Saudi Arabia. In Search of a Perfect Outfit?". J Cardiol Curr Res 8(3): 00281. DOI: 10.15406/jccr.2017.08.00281
- BaxL, Algra A, Mali WP, Edlinger M, Beutler JJ, vander Graaf Y. (2008) "Renal function as a risk indicator for cardiovascular events in 3216 patients with manifest arterial disease". Atherosclerosis: 20(1), pp. 84-91.
- Brady, WJ, Perron, AD, Chan, T. (2011) "Electrocardiographic ST-segment elevation: correct identification of acute myocardial infarction (AMI) and non-AMI syndromes by emergency physicians". Acad Emerg Med, 8(4), pp. 49-60.
- Cziraky MJ, Reddy VS, Luthra R, Xu Y, Wilhelm K, et al. (2015) Clinical outcomes and medication adherence in acute coronary syndrome patients with and without type 2 diabetes mellitus: a longitudinal analysis 2006-2011. J Manag Care Spec Pharm 21(6): 470-477.
- Hakim JG et al. (2011) Acute myocardial infarction in a region of. Sebha Medical Journal, Vol. 10(2),
- Kosuge, M, Kimura, K, Ishikawa, T. (2006). "Differences between men and women in terms of clinical features of ST-segment elevation acute myocardial infarction?". Circulation Journal 70(3), pp. 222-226.
- Hari Prasad Trivedi, Qun Xiang and John P. Klein. Risk factors for non-fatal myocardial infarction and cardiac death in incident dialysis patients. NDT Nephrology Dialysis Transplantation Vol. 24, No. 1. Pp. 258-266.
- Manfroi WC et al. 2002 "Acute myocardial infarction. The first manifestation of ischemic heart disease and relation to risk factors, 78, pp, 392-395.
- Naghavi M, Libby P, Falk E, Casscells SW, Litovsky S, et al. (2003) From vulnerable plaque to vulnerable patient: a call for new definitions and risk assessment strategies: part I. Circulation 108(14): 1664-1672
- Pearte CA, Furberg CD, O'Meara ES, et al. (2006) "Characteristics and baseline clinical predictors of future fatal versus nonfatal coronary heart disease events in older adults. 113(18), pp, 77-85.
- Panagiotakos D et al. (2007) Cigarette smoking and myocardial infarction in young men and women: a case-control study. International Journal of Cardiology, 116: 371-375.
- PM Chege et al (2016) "cardiovascular disease risk factors in rural Kenya: evidence from a health and demographic surveillance system using the WHO STEP-wise approach, 85(2), pp, 54-61, DOI: 10.1080/20786190.2015.1114703
- Reda A, Bendary A, Elbahry A, Farag E, Mostafa T, Khamis H, Wadie M, Bendary M, Abdoul Azeem B, Salah R. (2021) "Prevalence of atherosclerosis risk factors in Egyptian patients with acute coronary syndrome: final data of the nationwide cross-sectional 'CardioRisk' project". J Public Health Afr. Feb 11(2), PP, 31-68. DOI: 10.4081/jphia.2020.1368. PMID: 33623654; PMCID: PMC7893316.
- Solomon, T. Fessahaye Alemseged. 2010 "Risk Factors for Cardiovascular Diseases among Diabetic patients Southwest Ethiopia, Ethiop J Health Sci, 20(2), pp, 121-128
- Teich V, Piha T, Fahham L, Squiassi HB, Paloni Ede M, et al. (2015) Acute Coronary Syndrome Treatment Costs from the Perspective of the Supplementary Health

System. Arq Bras Cardiol 105(4): 339-344.

Tamrakar, R., Bhatt, Y. D., Kansakar, S., Bhattarai, M., Shaha, K. B., & Tuladhar, E. (2014). Acute Myocardial Infarction in Young Adults: Study of Risk factors, Angiographic Features and Clinical Outcome. Nepalese Heart Journal, 10(1), 12–16.

Wakwaya R et al. (2019) “Clinical Features and Outcome of Acute Coronary Syndrome in Patients Presenting to the Emergency Department in Addis Ababa, Ethiopia. Austin J Cardiovasc Dis Atherosclerosis.; 6(1), pp,10-38.

Wilkinson P et al. (2009) “Comparison of case fatality in South Asian and white patients after acute myocardial infarction:observational,75,pp,112-116. BMJ 1996;31

