

## A descriptive study on risk factors among acute myocardial infarction patients admitted to the coronary care unit of Prince Mitab hospital Sakaka Aljouf.

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### Abstract

**Introduction and objectives:** Worldwide, acute myocardial infarction (MI) continues to be the leading cause of morbidity for hospital admissions. The current study was carried out with an objective to study the clinical, demographic and risk factors associated with MI patients admitted to cardiac care unit of Prince Mitab hospital. **Methods:** This descriptive study captured three-year retrospective data on patients admitted to cardiac care unit (CCU) from the medical records section of Prince Mitab hospital. Thirty percent of acute MI case files of each year from Jan-2013 to Dec-2015 were reviewed. Data was collected on demographic, disease risk factors (smoking, diabetes, and hypertension), and clinical presentation. Descriptive statistics was performed. **Results:** Of 1428 patients admitted to CCU, 270 had MI (19%). Number of admissions to cardiac care unit has risen from 372 patients in year 2013 to 533 patients in year 2015. Males (86%) outnumbered female patients with MI in all three years of study period ( $\chi^2= 6.84$ ;  $P<. 05$ ). Eighty two patients files (30% of each year) were further analyzed for demographic and risk factors. Majority (69.5%) of MI patients were Saudi nationals. Forty percent of patients were in the age group of 46 to 60 years. 42.7% patients were diabetic and 37.8% were hypertensive and 57.4% patients were smokers or ex-smokers. Chest pain (98.20%) was the most frequent presentation. Over all 96% of patients survived an episode of MI at this hospital. **Conclusion:** We conclude that there is an increase in the number of MI admissions from 2013-2015 at prince Mitab hospital. Male gender, diabetes, hypertension and smoking continue to be the leading risk factors for MI.

**Key-words:** Myocardial infarction, Descriptive, risk factors, Saudi Arabia

### A. Introduction

Worldwide, 32 million individuals suffer from acute coronary and a cerebral vascular event every year. Half of these events occur in individuals with an established Coronary heart disease (CHD) and cerebro-vascular disease (CVD).<sup>[1]</sup> Patients of stroke or myocardial infarction (MI) are at an increased risk of recurrence of these events.<sup>[2-5]</sup> Identifying such patients and offering them preventive treatment would prevent such recurrence and improve survival.

Coronary artery disease (CAD) is a set of disorders affecting heart and blood vessels, a major health problem in both developed and developing countries.<sup>[5-6]</sup> In many countries CAD is the major cause of premature deaths.<sup>[7,8]</sup> Over the age of 35 years CAD is responsible for one-third of all deaths in United States of America.<sup>[9]</sup> This share of deaths due to coronary artery diseases forced the health authorities to focus on primary and secondary levels of prevention.

About 50%-70% of ischemic heart disease is represented by myocardial infarction (MI) and MI continues to be the leading morbidity for hospital admissions.<sup>[10-11]</sup> Many factors have been identified related to MI that includes

smoking, diabetes, systemic arterial hypertension and dyslipidemia.<sup>[11-15]</sup> Risk factors for myocardial infarction in a retrospective study in Tehran between elderly and non-elderly highlights that diabetes and systolic hypertension were more common among elderly while as male gender, smoking and family history of IHD were more common risk factors among non-elderly population.<sup>[16]</sup>

In a large study on the impact of risk factors for acute MI in middle east countries have shown that population attributable risk (PAR) of the nine risk factors was higher in middle east (97.5%) than worldwide (90.4%), elevated apolipoprotein ApoB/ Apo A1 had strongest association with acute MI followed by smoking.<sup>[17]</sup> There is a very limited research on community-based prevalence of CAD in Aljouf region of Kingdom of Saudi Arabia. A hospital-based study has shown that CAD is one of leading reason for hospital admissions.<sup>[18]</sup>

Kingdom of Saudi Arabia has undergone a huge change in life style, eating habits and tobacco use resulting in an increase in lifestyle related disease like coronary artery disease, hypertension and diabetes.<sup>[19]</sup> There are many benefits of growing economy but it is also accompanied by changes in lifestyle that are conducive for atherosclerosis and MI.

As there is a limited data on patients with acute MI in Aljouf region of Saudi Arabia, current study was aimed to explore the number of MI patients and risk factor analysis in patients of MI admitted in prince Mitab Hospital, Sakaka Aljouf region of Saudi Arabia.

**B. Methods**

**Design:** This is a hospital based retrospective descriptive study carried out between Dec-15 to Mar-16.

**Setting and Sample:** Prince Mitab hospital is a secondary care institute of Ministry of Health situated in the capital city of Sakaka Aljouf region. It is a 300-bedded hospital with 15 beds dedicated to cardiac care unit; it provides 24-hour emergency coverage open to everyone and from which appropriate patients are admitted to medical wards when required. This hospital also serves ministry of higher education by allowing clinical training for undergraduate medical students of Aljouf University.

Data on admissions to cardiac care unit was collected from the medical records section. Retrospective data of last three years from Jan-2013 to Dec-2015 was requested from the medical records. A sample of 30% of acute MI patient case files of each year were selected by systematic random sampling and reviewed for data extraction. Data was extracted on a standard proforma developed for this study.

**Ethical approval:** The study was carried out in accordance with the ethical standards on human experimentation. Data collection was started after ethical clearance from college ethical committee and after proper permission was sought to access the hospital records from Ministry of health Aljouf region.

**Data Collection**

Data was collected on age, gender, disease risk factors (smoking, diabetes, and hypertension), and clinical presentation of patient admitted with MI.

**Statistical analysis**

Data was analyzed using SPSS version-18. Data was coded before entry. Data has been presented as descriptive statistics. Chi square test was used for any significant difference between categories, a P < .05 was considered significant.

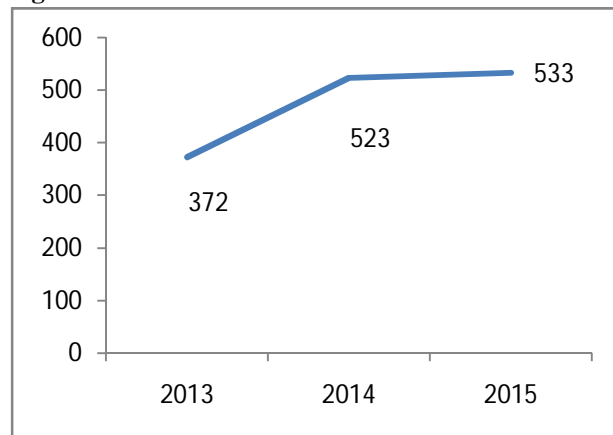
**C. Results**

The first part of the results present the admissions of MI over a three-year period from 2013 to 2015 and the second part presents the demographic and risk factor distribution among the admitted patients.

**MI admissions to cardiac care unit over a three-year period (2013-2015)**

Fig-1 presents the admissions to cardiac care unit of prince Mitab hospital over a three-year period 2013-2015. The admissions to cardiac care unit rose from 372 patients in year 2013 to 533 patients in year 2015. These admissions were a result of variety of reasons for admission that also included patients with myocardial admission that increased in year 2014 to decrease again in 2015.

**Fig-1: Total Admissions to cardiac care unit 2013-15**



**Fig-2: Total Admissions of MI patients to cardiac care unit 2013-15.**

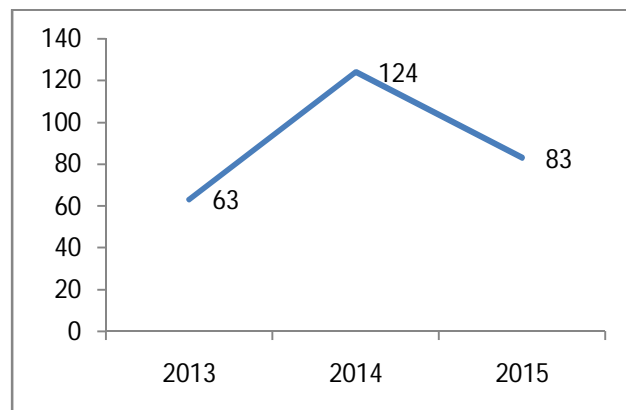


Fig-2 presents the number of admissions with MI to cardiac care unit. There were 63 myocardial infarction

patients admitted to cardiac care unit in year 2013 that nearly got doubled (124) in year 2014 and then decreased to 83 admissions in year 2015. Compared to 2013, there was an increase in the number of MI cases by 31.7% by 2015.

**Table-1: MI among males and females year 2013 to 2015**

Year	Males	Females	Chi square and P value
2013	58 (92%)	5 (8%)	6.8406,P= 0.032703
2014	103(83%)	21(17%)	(P=<0.05)
2015	78(94%)	5 (6%)	

**Table-2: Socio-demographic characteristics of MI patients (N=82).**

Demographic Characteristic	Number	Percent
<b>Gender</b>	Male	71 86.6
	Female	11 13.4
<b>Age (in Years)</b>	30-45	21 25.6
	46-60	33 40.2
	60 & above	28 34.1
<b>Nationality</b>	Saudi	57 69.5
	Non-Saudi	25 30.5
<b>Marital status</b>	Married	73 89
	Un-married	9 11
<b>Smoking status</b>	Non-smokers	35 42.7
	Current Smokers	39 47.6
	Ex-smokers	8 9.8

**Table-3: Risk factors distribution among MI patients (N=82).**

Number	Number	Percent
<b>Diabetes</b>	35	42.7
<b>Hypertension</b>	31	37.8
<b>History of Coronary disease</b>	19	23.2
<b>History of TIA</b>	4	4.9
<b>Family history of Heart disease</b>	14	17.1
<b>Smoker (Ex and current)</b>	47	57.3
<b>Hyper-lipidemia</b>	24	29.3

**Table-4: Presenting Symptoms and outcome of MI patients (N=82).**

Presenting symptoms	Number	Percent
<b>Chest Pain</b>	74	90.2
<b>Chest tightness</b>	10	12.2
<b>Nausea &amp; Vomiting</b>	15	18.3
<b>Epigastric pain</b>	9	11
<b>Breathlessness</b>	12	14.6

<b>Dizziness</b>	Yes	2	2.4
<b>Fatigue</b>	Yes	3	3.7
<b>Outcome (Survived)</b>	Yes	79	96.3

Male’s outnumbered female’s patients with MI over the three-year study period. There is a wide variation in MI admissions to cardiac care unit between males and females. Results show a significant difference in MI admission between males and females (P<0.05) Table-1.

The second part of the result presents sub-analysis of the selected 30% case files of each study year (Total=82 case files).86.6% of MI patients were males and majority (69.5%) of them were Saudi nationals. 40.2% of the patients were in the age group of 46 to 60 years followed by 34.1% in the age group of 60 and above and.25.6% of patients were in the young age group of 30-45 years. 89% of the patients were married and 47.6% were current smokers (Table-2).

Table-3 presents the risk factor distribution among the study population. 42.7% patients with MI were diabetic and 37.8% were hypertensive. History of coronary artery disease was present in 23.2% of MI patients. 57.3% patients were smokers or ex smokers. 29.3% of MI patients had hyperlipidemia.

Results show that chest pain (90.2%) was the most frequent symptom experienced by MI patients, followed by nausea and vomiting in 18.3%cases. The other common presenting symptoms were breathlessness in 14.6% and chest tightness in 12.2%. 96% of patients survived an episode of MI were only 3.7% died in the hospital (Table-4).

#### D. Discussion

In men and women CHD is one of the causes of morbidity and mortality in many countries.<sup>[2-5]</sup> The number of admission to cardiac care unit in prince Mitab hospital shows a systematic increase from 372 admissions in 2013 to 533 in year 2015, similarly patients admitted with MI has also shown an increase over the three-year study period except for year 2014.

Premenopausal women have less incidence of CHD in the age matched men.<sup>[20]</sup> In the present study, 86.6% were males (Male to female ratio of 6.4:1). This is similar to the results in studies from some other Arab countries but higher than from communities in some industrialized countries.<sup>[21-23]</sup>

In the present study, diabetes is the most important predictor of MI, probably through its association with pre-existing left ventricular dysfunction and diffuse and rapidly progressive coronary atherosclerosis.<sup>[12,23]</sup> The present data indicated that 42.7% of all patients hospitalized at prince Mitab hospital with MI had diabetes. This data shows a higher proportion of patients with DM having MI, This is higher than the 10.5% to 30.0% reported in the other studies conducted in white patients in Britain and south Asian.<sup>[24]</sup> However, this higher proportion of DM is also greater than that of

participants with diabetes among Saudi Arabian MI patients.<sup>[20,23]</sup> This could be either due to meticulous recording of diabetes among MI patients in prince Mitab hospital or over reporting of this condition.

The current study shows a hypertension prevalence of 37.8% of patients with MI. Hypertension is known to cause ventricular hypertrophy that probably lead to earlier symptoms of MI and also forces patients to seek care, hence being recorded more frequently in patients admitted with MI.<sup>[25]</sup>

A recent study suggested that smoking is an important contributor to MI under the age of 36 Years.<sup>[24]</sup> Smoking increases the initial and subsequent risk MI and death. Furthermore, smoking and cholesterol having a strong positive association is well established that increases the risk of MI.<sup>[26]</sup>

Current study showed that 58% of MI patients admitted to prince Mitab hospital were current (47.7%) or ex-smokers. This is higher than other study carried out by Wilkinson P et al, which showed 17% as smokers.<sup>[23]</sup>

Among the presenting symptoms chest pain was frequently reported by MI patients admitted at Prince Mitab hospital being present in 90.2% cases, followed by nausea and vomiting in 18.3% of cases, current results run in conformity with a study conducted by A. R. Abdulkarem et al. who showed chest pain in 89.7% cases of MI as the leading presenting symptom.<sup>[27]</sup> Study observed a mortality rate of 3.7% among MI patients over the three year period.

### Conclusion

Keeping in view the increasing trend of MI, which carries a high mortality rate, primary preventive activities should focus on the risk factors. Physicians should be encouraged to educate the people about the risks of diabetes, hypertension and smoking. Schools administration should be sensitized to impart health messages on smoking. Public health awareness campaigns should be initiated and should focus on primary prevention and secondary level of prevention by early diagnosis and effective treatment of diabetes and hypertension.

### Limitations

This study was carried out by analyzing data of last three years only so results have to be read with caution.

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### E.References

1. The World Health Report 2002. Reducing risks, promoting healthy life. Geneva: World Health Organization; 2002.
2. Krumholz HM, Lin Z, Keenan PS, Chen J, Ross JS, Drye EE, et al. Relationship between hospital readmission and mortality rates for patients

- hospitalized with acute myocardial infarction, heart failure, or pneumonia. *Jama*. 2013;309(6):587-93.
3. Canto JG, Rogers WJ, Goldberg RJ, Peterson ED, Wenger NK, Vaccarino V, et al. Association of age and sex with myocardial infarction symptom presentation and in-hospital mortality. *Jama*. 2012;307(8):813-22.
4. Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, De Simone G, et al. Heart disease and stroke statistics—2010 update. *Circulation*. 2010;121(7):e46-e215.
5. Mahmoodi MR, Baneshi MR, Rastegari A. Comparison of conventional risk factors in middle-aged versus elderly diabetic and nondiabetic patients with myocardial infarction: prediction with decision-analytic model. *TherAdvEndocrinolMetab*. 2015;6(6):258-66.
6. Holzmann MJ, Jungner I, Walldius G, Ivert T, Nordqvist T, Ostergren J, et al. Dyslipidemia is a strong predictor of myocardial infarction in subjects with chronic kidney disease. *Ann Med*. 2012;44(3):262-70.
7. Chen SM, Tsai TH, Hang CL, Yip HK, Fang CY, Wu CJ, et al. Endothelial dysfunction in young patients with acute ST-elevation myocardial infarction. *Heart Vessels*. 2011;26(1):2-9.
8. Adhikari CM, Prajapati D, Baniya B, Regmi S, Bogati A, Thapaliya S. Prevalence of Conventional Risk Factors in ST Segment Elevation Myocardial Infarction Patients in ShahidGangalal National Heart Centre, Nepal. *JNMA J Nepal Med Assoc*. 2014;52(195):914-9.
9. Canto JG, Kiefe CI, Rogers WJ, Peterson ED, Frederick PD, French WJ, et al. Atherosclerotic risk factors and their association with hospital mortality among patients with first myocardial infarction (from the National Registry of Myocardial Infarction). *The American journal of cardiology*. 2012;110(9):1256-61.
10. Rosamond WD, Chambless LE, Heiss G, Mosley TH, Coresh J, Whitsel E, et al. Twenty-two year trends in incidence of myocardial infarction, CHD mortality, and case-fatality in four US communities, 1987 to 2008. *Circulation*. 2012:CIRCULATIONAHA. 111.047480.
11. Nabel EG, Braunwald E. A tale of coronary artery disease and myocardial infarction. *New England Journal of Medicine*. 2012;366(1):54-63.
12. Sadowski M, Gasior M, Gierlotka M, Janion M, Poloński L. Gender-related differences in mortality after ST-segment elevation myocardial infarction: a large multicentre national registry. *EuroIntervention: journal of EuroPCR in collaboration with the Working Group on*

- Interventional Cardiology of the European Society of Cardiology. 2011;6(9):1068-72.
13. Yeh RW, Sidney S, Chandra M, Sorel M, Selby JV, Go AS. Population trends in the incidence and outcomes of acute myocardial infarction. *New England Journal of Medicine*. 2010;362(23):2155-65.
  14. Roe MT, Messenger JC, Weintraub WS, Cannon CP, Fonarow GC, Dai D, et al. Treatments, trends, and outcomes of acute myocardial infarction and percutaneous coronary intervention. *Journal of the American College of Cardiology*. 2010;56(4):254-63.
  15. Herrett E, Shah AD, Boggon R, Denaxas S, Smeeth L, van Staa T, et al. Completeness and diagnostic validity of recording acute myocardial infarction events in primary care, hospital care, disease registry, and national mortality records: cohort study. *Bmj*. 2013;346: f2350.
  16. Dabiran S, Khalegi B, Khajehnasiri F. Comparison of elderly and non-elderly: A 24 year study. *Advances in Aging Research*, 4, 13-17.
  17. Gehani A, Al-Hinai A. et al. Association of risk factors with acute myocardial infarction in middle east countries: the INTERHEART Middle East Study. *European Journal of Preventive Cardiology*. 2014, Vol.21(4)400-410.
  18. Alwan A. Prevalence and control of cardiovascular disease. Geneva: WHO, EMRO Technical publications, 1995: 22 [Eastern Mediterranean Series].
  19. Midhet F, Al Mohaimed AR, Sharaf F. Dietary practices, physical activity and health education in Qassim region of Saudi Arabia. *International J. Health Sciences*. 2010; 4: 3-12.
  20. Tunstall-Pedoe H, Morrison C, Woodward M, Fitzpatrick B, Watt G. Sex differences in myocardial infarction and coronary deaths in the Scottish MONICA population of Glasgow 1985 to 1991. *Circulation*. 1996;93(11):1981-92.
  21. Rashed WA et al. Thrombolytic therapy in acute myocardial infarction: experience at a university hospital in Kuwait. *Annals of Saudi Medicine*, 1998, 18:301–304.
  22. Grundy SM et al. Assessment of cardiovascular risk by use of multiple risk factor assessment equations. *Circulation*, 1999,100:1481–1492.
  23. Wilkinson P et al. Comparison of case fatality in South Asian and white patients after acute myocardial infarction: observational study. *British Medical Journal*, 1996, 312:1330–1333.
  24. Hakim JG et al. Acute myocardial infarction in a region of Saudi-Arabia—the Gizan experience. *Saudi Medical Journal*, 1991, 12:392–396.
  25. Manfro WC et al. Acute myocardial infarction. The first manifestation of ischemic heart disease and relation to risk factors. *Arquivos Brasileiros de Cardiologia*, 2002, 78:392–395.
  26. Hebert JR, Kabat GC. Difference in dietary intake associated with smoking status. *European Journal of Clinical Nutrition*, 1990, 44:185–193.
  27. Abdulkarem A, El-Shareif H, Sharif S. Evaluation of risk factors in acute myocardial infarction patients admitted to the coronary care unit, Tripoli Medical Centre, Libya. *Eastern Mediterranean Health Journal*. 2012;18(4):332.

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