The Professional Medical Journal
www.theprofesional.com

DOI: 10.17957/TPMJ/17.3409

ORIGINAL PROF-3409

ACUTE CORONARY SYNDROME;

FREQUENCY, CONTRIBUTING FACTORS AND TYPES IN PATIENT WITH TYPICAL CHEST PAIN

Dr. Naveed Aslam Lashari[1], Dr. Nadia Irum Lakho[2], Dr. Sarfaraz Ahmed Memon[3], Dr. Ayaz Ahmed[4], Dr. Muhammad Fahad Waseem[5]

1. MBBS FCPS
   Medical Specialist
   PAF Hospital Lahore
2. MBBS, Dip (Hospital Management)
   PAF Hospital Lahore
3. MBBS
   PAF Hospital Mushaf Sargodha
4. MBBS, FCPS
   Medical Specialist Samungli
5. MBBS, FCPS
   Medical Specialist
   PAF Hospital Masroor Karachi

Correspondence Address:
Sqn Ldr Naveed Aslam
Medical Specialist
F. No E-34/5,
PAF officers Residence
Tariq Road,
Opposite PAF hospital Lahore
Cantonment, PAF Base Lahore
lasharinaveed@hotmail.com

Article received on:
16/05/2016
Accepted for publication:
29/09/2016
Received after proof reading:
07/03/2017

ABSTRACT… **Introduction:** ACS is defined as the cluster of symptoms arising due to the rapid drop of blood flow to the heart because of coronary artery obstruction. It is stated that world-wide around 17 million people die due to cardiovascular diseases of which half of the deaths are reported due to ACS. Chest pain is known to be the most leading factor associated with ACS. **Objectives:** To determine the frequency of acute coronary syndrome, its types and common contributing factors in patients presenting with typical chest pain in a secondary care hospital. **Study Design:** Cross sectional study. **Setting:** Medical Unit, PAF Hospital Mushaf Sargodha. **Period:** October 2013 to March 2014. **Methodology:** A total of 280 patients of either gender, aged 20 to 80 years presented with typical chest pain with or without conventional risk factors were included in the study. **Results:** Majority (68.9%) was males and 31.1% were female. Acute coronary syndrome was observed in 131(46.8%) patients. Out of these 131 patients, 55% had NSTEMI, 28.2% had unstable angina and 16.8% had STEMI. A higher proportion of females were found to have ACS as compared to males (75.9% vs 33.7%, P-value<0.0001). Out of 131 patients, 40.5% were diabetic, 29.8% were hypertensive 16% were hyperlipidemic, while 13.7% were smokers. Conventional risk factors except smoking were observed more in females as compared to males. **Conclusion:** Majority of patients with acute coronary syndrome were females and diabetic. NSTEMI was the most common type of ACS. Prevalence of conventional risk factors was found more in females with ACS.

Key words: Acute coronary syndrome, ST-segment elevation, Non-ST segment elevation, unstable angina pectoris.

Article Citation: Lashari NA, Lakho NI, Ahmed S, Ahmed A. Acute coronary syndrome; frequency, contributing factors and types in patient with typical chest pain. Professional Med J 2017;24(3):409-413. **DOI:** 10.17957/TPMJ/17.3409

INTRODUCTION

Amongst several causes of adults presenting in emergency department chest pain is the most common cause accounting 506 million emergencies every twelve months.[1] Chest pain is considered an important factor contributing to cardiovascular diseases that is why patients presenting with typical chest pain undergo thorough evaluation as the major goal of physicians is to assess whether the pain is due to cardiac disease. Acute coronary syndrome (ACS) is known to be the chief indicator of ischemic heart disease (IHD) which is major part of cardiovascular disease.[2] Amongst several causes of ACS, coronary artery disease is also considered as a risk factor.[3] ACS is defined as the cluster of symptoms arising due to the rapid drop of blood flow to the heart because of coronary artery obstruction. Spectrum of ST-elevation Myocardial Infarction, non-ST elevation Myocardial Infarction and unstable angina are included in ACS.[4] It has been reported that cardiac disease puts around 17 million people to death each year, of which half of the deaths are caused due to acute coronary syndrome (ACS).[3]

The characterization of ACS is mainly done by chest pain, therefore chest pain is known to be the primary source of ACS.[5] Researchers reported the prevalence of ACS in patients presenting with chest pain as low as 13%[6] and as high as 46%.[7] Sometimes, patients with ACS may not have typical chest pain. It has been reported that ACS patients without typical chest pain accounts for 33.33% elderly and 25% youth with high proportion of males 69.23%; commonly affecting inferior and anteroseptal wall (29.3% and 27.3% respectively).[8]

Hypertension, diabetes mellitus, smoking and dyslipidemia are considered as the conventional common modifiable risk factor of ACS as majority of the patients diagnosed with ACS have one or more of these risk factors.[7] Many researchers reported diabetes mellitus, STEMI, unstable angina, hyperlipidemia and hypertension as most common diagnosis in ACS.[7,9] In 2007, a nationwide study was carried out in Pakistan reported USA and STEMI as the major types of ACS (43.0% and 40.5% respectively).[10]

Nationally, literature regarding ACS in patients presenting with chest pain is scarce. Therefore, in this study the authors aimed to determine the frequency, types and common risk factors contributing to ACS in patients presenting with typical chest pain in secondary care Hospital that will ultimately contribute to better understanding of ACS.

OBJECTIVE

To determine the frequency of acute coronary syndrome, its types and common contributing factors in patients presenting with typical chest pain in a secondary care hospital.

METHODOLOGY

This was a cross sectional study carried out Medical unit, PAF Hospital Mushaf Sargodha from October 2013 to March 2014. A total of 280 patients were included in this study. All patients (either gender) of age 20 to 80 years presented with typical chest pain with or without conventional risk factors mentioned above were included in the study. Patients with previous history of IHD and already on treatment, positive ETT, positive angiography and evaluated for chest pain within last 6 months were excluded.

Informed consent was taken from all the eligible patients. Demographics like name, gender, age and address was noted. Acute coronary syndrome (ACS) was confirmed by history, ECG changes, Troponin T (after 4 to 5 hours of typical chest pain and positive with Troponin T rapid test kit).

After taking detailed history regarding pattern of chest pain, any risk factor and investigations, patients were placed in different categories of ACS and non-cardiac chest pain. Treatment was offered according to initial diagnosis and risk factors were enlisted.

Statistical Analysis

Data were entered and analyzed using statistical package SPSS version 21.0. Mean (SD) were computed for all the quantitative variables like age. Frequency and percentage were computed for all the qualitative variables like gender, ACS, types of ACS, duration of diabetes, duration of hypertension and contributing factors. Chi-square test and likelihood ratio Chi-square test were applied to assess significant association of ACS and its contributing factors with gender. P-value$<$0.05 was considered significant.

RESULTS

Out of 280 patients majority (68.9%) were males and 31.1% were female. Mean ($\pm$SD) age of the patients was 48.7 ($\pm$13.5) years. Acute coronary syndrome was observed in 131(46.8%) patients (Table-I). Out of these 131 patients, 72 (55%) patients had NSTEMI, 37 (28.2%) patients had unstable angina and 22 (16.8%) patients had STEMI (Table-II). Out of 131 patients, 53 (40.5%) patients were diabetic (22 males and 31 females), 39 (29.8%) patients were hypertensive (17 males and 22 females), 21(16%) patients were hyperlipidemic (09 males and 12 females), while 18 (13.7%) patients were smokers (17 males and 01 female) (Table-II-III). Higher proportion of females with ACS were found to have diabetes, hypertension and hyperlipidemia as compared males (p-value$<$0.0001, Table-III). A higher proportion of females were found to have ACS as compared to males (75.9% vs 33.7%, P-value$<$0.0001, Table-III).

DISCUSSION

Acute coronary syndrome (ACS) is the chief indicator of ischemic heart disease (IHD) encompassing unstable angina, ST-segment elevation myocardial infarction and non-ST-segment elevation myocardial infarction.[11] Cardiac

diseases are the most neglected health problem in women even though they are the prominent source of death in females. Due to cardiovascular causes, each year deaths in women are reported more than men. In 2004, a higher proportion of deaths in females were reported globally due to of heart diseases as compared to men (32% vs 27%.[12] In Pakistan regardless of age IHD is reported to the 2nd prominent cause of death accounting 11% of all deaths.[13] However, IHD is known to be the most common source of death in both men and women globally.[14]

The conventional contributing factors for IHD includes hypertension, diabetes mellitus, smoking, and hyperlipidemia.[15] A recent cohort study found that in general population development of more than 80% myocardial infarction attributes to these risk factors and physical in-activity.[16]

Age (years)	
Mean ± SD	48.7±13.5
Age groups; n (%)	
20-40	75 (26.8)
41-60	154 (55.0)
61-80	51 (18.2)
Total	280 (100)
Gender; n (%)	
Male	193 (68.9)
Female	87 (31.1)
Total	280 (100)
ACS; n (%)	
Yes	131 (46.8)
No	149 (53.2)
Total	280 (100)

Table-I. Characteristics of study participants

Types of acute coronary syndrome (ACS); n (%)	
NSTEMI	72 (55)
Unstable angina	37 (28.2)
STEMI	22 (16.8)
Total	131 (100)
Contributing factors to ACS; n (%)	
Diabetes	53 (40.5)
Hypertension	39 (29.8)
Hyperlipidemic	21 (16)
Smoking	18 (13.7)
Total	131 (100)
Duration of hypertension (years)	
1-5	7 (17.9)
6-10	12 (30.8)
11-15	20 (51.3)
Total	39 (100)
Duration of diabetes (years)	
1-5	13 (24.5)
6-10	17 (32.1)
11-15	23 (43.4)
Total	53 (100)

Table-II. Characteristics of ACS patients

The prevalence of these risk factors differs in both the genders, together in common population and IHD patients. In this study we studied the differences in the frequency of conventional risk factors in patients with ACS between both the genders.

In our study majority of the ACS patients were found to have at least one contributing factor. In literature, the incidence of patients having ACS with minimum one risk factor varies. In 2003, Khot et. al. did a meta-analysis of 14 clinical trials of cardiovascular disease including 1,22,458

ACS	Gender			P-value
	Male	Female	Total	
	n (%)	n (%)	n (%)	
Yes	65 (33.7)	66 (75.9)	131 (46.8)	0.000**ǂ
No	128 (66.3)	21 (24.1)	149 (53.2)	
Total	193 (100)	87 (100)	280 (100)	
Factors contributing to ACS				
Diabetes	22 (41.5)	31 (58.5)	53 (100)	0.000**‡
Hypertension	17 (43.6)	22 (56.4)	39 (100)	
Hyperlipidemic	9 (42.9)	12 (57.1)	21 (100)	
Smoking	17 (94.4)	1 (5.6)	18 (100)	
Total	65 (49.6)	66 (50.4)	131 (100)	

Table-III. Gender wise distribution of ACS and factors contributing to ACS

**P-value<0.0001, ǂChi-square test, ‡Likelihood ratio Chi-square test

patients. They found that majority of the patients had ACSwith 84.6% women and 80.6% men having at least one of the four conventional risk factors.[15] Comparable results were seen in Hammoudeh et. Al[17] and Greenland et. al.[18]

In our study hypertension and diabetes were found to be more common in women than men and the results are comparable with the literature.[15,19,20]

In our study higher proportion of men was found smoker as compared to women. This result has also been observed in earlier studies.[19,20] Although the results of our study regarding prevalence of smoking in females were as expected but it cannot be assured that no female in our study had ever smoked. This result may be described as females usually hesitate and afraid of disclosing their smoking habits.

Commonness of hypertension and diabetes in females and smoking in males can be illuminated as these are the key threats for ischemic heart disease (IHD), so in general populace, the gender–related dissemination of these risk factors can be imitated in IHD patients in their gender-related prevalence. A study done in Pakistan in 2007, found higher proportion of diabetes, hypertension and hyperlipidemia in women as compared to men, although smoking was more common in men than in women.[21]

National Health Survey of Pakistan (1990-1994) did a remarkable work in understanding the condition of well-being of Pakistani people. Recently, National Health Survey of Pakistan has published some more outcomes from this survey. According to these results, 28.6% men and 3.4% women aged ≥ 15 years in general population, were smokers.[22]

It has been observed that risk of developing IHD along with the aforementioned risk factors differs in both the genders.[23] Howard et al reported overall higher frequency of myocardial infarction men comparing to women; however in diabetic patients women were found to had significantly higher incidence of MI than men.[24] Furthermore, in ACS patients worse outcome had been reported in diabetic women as compared to diabetic men.[25]

CONCLUSION

Majority of patients with acute coronary syndrome were females and diabetic. NSTEMI was the most common type of ACS. Prevalence of conventional risk factors was found more in females with ACS.

REFERENCES

1. Goldman L, Kirtane AJ. **Triage of patients with acute chest pain and possible cardiac ischemia: the elusive search for diagnostic perfection.** Ann Intern Med. 2003;139(12):987-95.
2. Antman EM, Selwyn A, Braunwald E, Loscalzo J. **Ischemic heart disease. Harrison's principles of internal medicine.** McGraw Hill; 2008. p. 1514-26.
3. Hamilton B, Kwakyi E, Koyfman A, Foran M. **Diagnosis and management of acute coronary syndrome: Diagnostic et prise en charge du syndrome coronarien aigu.** AfJEM. 2013;3(3):124-33.
4. Newby DE, Grubb NR, Bradbury A. **Cardiovascular disease. Davidson's principles and practice of medicine.** Churchill Livingstone Elsevier; 2010. p.521-640.
5. Hamm CW, Bassand J-P, Agewall S, Bax J, Boersma E, Bueno H, et al. **ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation.** Eur Heart J. 2011;32(23):2999-3054.
6. Mokhtari A, Dryver E, Soderholm M, Ekelund U. **Diagnostic values of chest pain history, ECG, troponin and clinical gestalt in patients with chest pain and potential acute coronary syndrome assessed in the emergency department.** Springerplus. 2015;4(1):219.
7. Parkash O, Almas A, Hameed A, Islam M. **Comparison of non cardiac chest pain (NCCP) and acute coronary syndrome (ACS) patients presenting to a tertiary care center.** JPMA The Journal of the Pakistan Medical Association. 2009;59(10):667-71.
8. Shakoor, Tariq M, Sher, Falik, Shah, A SF. **Incidence of Atypical Presentation of Myocardial Infarction.** Pak Heart J. 2012;41(1-2).
9. Liu CH, Huang YC. **Comparison of STEMI and NSTEMI patients in the emergency department.** Journal of Acute Medicine. 2011;1(1):1-4.
10. Jafary MH, Samad A, Ishaq M, Jawaid SA, Ahmad M, Vohra EA. **Profile of acute myocardial infarction (AMI)**

in Pakistan. Pak J Med Sci. 2007;23(4):485.

11. E B, AS F, DL K, al e. **Harrison's principles of internal medicine: 15 ed.** New York, Mc-Graw-Hill; 2001. p. 1386-8.

12. Gao YT, Shu XO, Dai Q, Potter JD, Brinton LA, Wen W, et al. **Association of menstrual and reproductive factors with breast cancer risk: results from the Shanghai Breast Cancer Study.** Int J Cancer. 2000;87(2):295-300.

13. Andrieu N, Prevost T, Rohan T, Luporsi E, Le M, Gerber M, et al. **Variation in the interaction between familial and reproductive factors on the risk of breast cancer according to age, menopausal status, and degree of familiality.** Int J Epidemiol 2000;29(2):214-23.

14. Stramba-Badiale M, Fox KM, Priori SG, Collins P, Daly C, Graham I, et al. **Cardiovascular diseases in women: a statement from the policy conference of the European Society of Cardiology.** Eur Heart J. 2006;27(8):994-1005.

15. Khot UN, Khot MB, Bajzer CT, Sapp SK, Ohman EM, Brener SJ, et al. **Prevalence of conventional risk factors in patients with coronary heart disease.** JAMA. 2003;290(7):898-904.

16. Heidemann C, Hoffmann K, Klipstein-Grobusch K, Weikert C, Pischon T, Hense H-W, et al. **Potentially modifiable classic risk factors and their impact on incident myocardial infarction: results from the EPIC-Potsdam study.** European journal of cardiovascular prevention and rehabilitation: official journal of the European Society of Cardiology, Working Groups on Epidemiology & Prevention and Cardiac Rehabilitation and Exercise Physiology. 2007;14(1):65-71.

17. Hammoudeh AJ, Al-Tarawneh H, Elharassis A, Haddad J, Mahadeen Z, Badran N, et al. **Prevalence of conventional risk factors in Jordanians with coronary heart disease: the Jordan Hyperlipidemia and Related Targets Study (JoHARTS).** Int J Cardiol. 2006;110(2):179-83.

18. Greenland P, Knoll MD, Stamler J, Neaton JD, Dyer AR, Garside DB, et al. **Major risk factors as antecedents of fatal and nonfatal coronary heart disease events.** Jama. 2003;290(7):891-7.

19. Kurtulmus N, Bos S, Arslan S, Kurt T, Tukek T, Ince N. **Differences in risk factors for acute coronary syndromes between men and women.** Acta cardiologica. 2007;62(3):251-5.

20. Yasar AS, Turhan H, Basar N, Metin F, Erbay AR, Ilkay E, et al. **Comparison of major coronary risk factors in female and male patients with premature coronary artery disease.** Acta cardiologica. 2008;63(1):19-25.

21. Jafar TH, Qadri Z, Chaturvedi N. **Coronary artery disease epidemic in Pakistan-more electrocardiographic evidence of ischemia in women than in men.** Heart. 2007.

22. Ahmad K, Jafary F, Jehan I, Hatcher J, Khan AQ, Chaturvedi N, et al. **Prevalence and predictors of smoking in Pakistan: results of the National Health Survey of Pakistan. European journal of cardiovascular prevention and rehabilitation: official journal of the European Society of Cardiology, Working Groups on Epidemiology & Prevention and Cardiac Rehabilitation and Exercise Physiology.** 2005;12(3):203-8.

23. Pardue M-L, Wizemann TM. **Exploring the Biological Contributions to Human Health: Does Sex Matter?:** National Academies Press; 2001.

24. Howard BV, Lee ET, Fabsitz RR, Robbins DC, Yeh JL, Cowan LD, et al. **Diabetes and coronary heart disease in American Indians: The Strong Heart Study.** Diabetes. 1996;45 Suppl 3(Supplement 3):S6-13.

25. Pilote L, Dasgupta K, Guru V, Humphries KH, McGrath J, Norris C, et al. A **comprehensive view of sex-specific issues related to cardiovascular disease. CMAJ: Canadian Medical Association journal = journal de l'Association medicale canadienne.** 2007;176(6):S1-44.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Naveed Aslam Lashari	Main author	
2	Dr. Nadia Irum Lakho	Co-author	
3	Dr. Sarfaraz Ahmed Memon	Co-author	
4	Dr. Ayaz Ahmed	Co-author	
5	Dr. M. Fahad Waseem	Co-author	