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ASSOCIATION OF AGE WITH THE PATTERN OF ACUTE CORONARY SYNDROME: A PROSPECTIVE ANALYSIS AT A RURAL TERTIARY CARE HOSPITAL

Community Medicine

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ABSTRACT

Introduction: Acute Coronary Syndrome (ACS) is a group of illnesses that cause the heart to get less blood; these disorders include unstable angina, non-ST elevation myocardial infarction, and ST-elevation myocardial infarction. ACS is a serious illness that needs to be treated right away. In addition to closely monitoring chest discomfort and considering the patient's medical history, doctors use a variety of diagnostic procedures, including biochemical, electrocardiographic, and imaging methods, to diagnose ACS. Methods: The objective of the prospective study was to look into risk variables and age-related symptom patterns in individuals with acute coronary syndrome (ACS). Data from the cardiology patient records of Dr. RPGMC, Tanda (HP) and the Department of Community Medicine were used in the study. Based on inclusion and exclusion criteria, 60 ACS-diagnosed patients made up the sample size.: **Results:** The risk factor did not significantly differ across the groups (P=0.440). In every age group, diabetes was the most prevalent risk factor. Between the age groups, there was no discernible variation in ACS (P=0.896). The most prevalent age group in a single vessel was beyond 60, followed by 51 to 60. The most prevalent age group in double vessels was 41–50 years old, followed by >60 years old. The age group most prevalent in triple vessels was > 60 years old, followed by 51–60 years old. **Conclusion:** The patterns of symptoms and risk variables associated with age in patients with ACS are clarified by this study. The results demonstrate the strong correlations between gender and ACS as well as age and ACS. There was a noteworthy correlation observed between the age range of 51-60 years and ACS. A noteworthy correlation was seen between the gender of men and ACS.

KEYWORDS

Acute coronary syndrome, Cardiovascular disease, American Heart Association

Introduction

Acute Coronary Syndrome (ACS) encompasses various conditions that result in reduced blood flow to the heart, including ST-elevation myocardial infarction, non-ST elevation myocardial infarction, and unstable angina.[1] ACS is a critical condition that necessitates immediate attention. Doctors diagnose ACS by considering the patient's medical history, paying close attention to chest pain, and using various techniques, such as biochemical, electrocardiographic, and imaging methods.[2] The primary symptom of ACS is chest pain, a heavy pressure or squeezing sensation accompanied by a burning feeling and difficulty breathing. This pain may spread to the left shoulder, neck, or arm and tends to worsen over time, often triggered by exercise or stress. Notably, it can also occur without an apparent cause.[3]

Every year, approximately 7 million people worldwide, including 1 million hospitalized patients in the US, are diagnosed with ACS, with a higher prevalence among older individuals.4,5 Compared to Western populations, the Asian region has been found to bear a more significant burden of cardiovascular disease (CVD), primarily impacting economically disadvantaged populations concentrated in South Asia.6 Previous studies have investigated the impact of age on various forms of ACS.7 Notably, statistics from the American Heart Association (AHA) reveal that 83% of coronary artery disease (CAD)-related deaths occur in patients aged 65 or older.[8] ACS mortality rates increase by an odds ratio of [1.7] for every 10-year increment beyond the age of 65. Elderly patients possess more cardiovascular risk factors and a higher burden of ischemic disease compared to younger patients.[9] Low-middle-income countries (LMICs) bear a significant burden, and Pakistan is particularly impacted, with a prevalence of 15.31% in the country.10. The present study was aimed to evaluate the association of age with the pattern of coronary artery disease.

Methods

The prospective study aimed to investigate age-related patterns of symptoms and risk factors in patients diagnosed with Acute Coronary Syndrome (ACS). The study utilized data collected from the cardiology patient records at Department of Community Medicine, and Cardiology in Dr RPGMC, Tanda (HP). The sample size was 60 ACS-diagnosed patients based on inclusion and exclusion criteria. The inclusion criteria were patients of all genders, patients diagnosed with Acute Coronary Syndrome (ACS), and patients whose records were available in the Cardiology, and Community medicinedepartment of Dr RPGMC, Tanda. The exclusion criteria included patients with incomplete or missing records, patients with a history of other cardiovascular diseases, and patients with incomplete questionnaire responses. The data were collected from the cardiology patient records of Dr RPGMC, Tanda. A questionnaire was developed to collect relevant information from the patient records which included demographic details, medical history, symptoms, risk factors, and relevant diagnostic test results. Trained personnel extracted the required information from the patient records and completed the questionnaire accordingly. Data entry was conducted using a secure and reliable database system. The study adhered to ethical guidelines and principles of data protection. Patient data was anonymized and kept confidential.

Statistical Analysis

The data were collected and enter the SPSS software version 22.0 for statistical analysis. Descriptive statistics were used to summarize the study population's demographic characteristics, symptoms, and risk factors. The chi-square test, or Fisher's exact test, was used to examine the association between age groups and symptoms/risk factors. A logistic regression analysis may have been performed to identify independent predictors of ACS in different age groups. Statistical significance was set at $p < 0.05$.

Results

Baseline Characteristics

Baseline characteristics shows that the most common age group was >60 years (31.66%) followed by ≤30 years (8.33%), 31-40 years (13.33%), 41-50 years (21.66%), and 51-60 years (25%). 60% of patients were male and 40% of patients were female. 40% of patients were overweight. 68.33% of patients had family history (Table 1).

Risk Factor

In this study, diabetes was the most common risk factor diabetes (38.33%), hypertension (36.66%), CAD (13.33%), smoking (5%), and dyslipidaemia (6.66%) (Table 2).

Acute coronary syndrome

In this study, 5.33% of patients had single vessel, 35% of patients had double vessel, and 11.66% of patients had triple vessel (Table 3).

Association between age and risk factor

In this study, there was no significant difference in risk factor between the groups (P=0.440). Diabetes was the most common risk factor in each age group (Table 4).

Association between age and ACS

In this study, there was no significant difference in ACS between the age group (P=0.896). In single vessel, >60 years was the most common age group followed by 51-60 years. In double vessel, 41-50 years was the most common age group followed by >60 years. In triple vessel, > 60 years was the most common age group followed by 51-60 years (Table 5).

Discussion

Cardiovascular diseases (CVDs) have been regarded as main causes of mortality in both developing and developed countries.11,12 The prevalence of CVDs has been reported to be increasing at a remarkable pace in both low- and middle income countries.[13] CVD can lead to the development of coronary artery disease in which blood flow to the heart is limited, which, in turn, gives way to the development of acute myocardial infarction (AMI), one of the 5 leading causes of mortality.[14]

Acute coronary syndrome (ACS) includes a number of coronary artery diseases, such as ST-segment elevation myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI), and unstable angina (UA).[15] Myocardial infarction is a clinical condition in which blood flow to the myocardium is disturbed, leading to inadequate oxygenation which, in turn, results in myocardial injury and subsequent infarction.16 According to research conducted in Iraq, AMI leads to death in 16.1% of AMI patients,[17] a rate higher than that seen in other developing countries, such as Iran (9.4%) and Saudi Arabia (3.0%).[18,19]

The most common age group was >60 years (31.66%) followed by ≤30 years (8.33%), 31-40 years (13.33%), 41-50 years (21.66%), and 51-60 years (25%). 60% of patients were male and 40% of patients were female. 40% of patients were overweight. 68.33% of patients had family history. In a study by Anthony et al, the majority of patients (58.3%) fell into the 50-69 years age range, followed by 70-89 years (21.2%) and 30-49 years (19%). The lowest number of patients was in the 10-29 years age group (0.7%). Gender distribution revealed that 60% of the patients were male and 40% were female, with the highest proportion of males in the 50-69 age range (55%) and females in the 50-69 years age range (63.6%).[20]

In a study by Canto et al, The proportion of MI patients who presented without chest pain was significantly higher for women than men (42.0% [95% CI, 41.8%-42.1%] vs 30.7% [95% CI, 30.6%-30.8%]; P< .001). There was a significant interaction between age and sex with chest pain at presentation, with a larger sex difference in younger than older patients, which became attenuated with advancing age. Multivariable adjusted age-specific odds ratios (ORs) for lack of chest pain for women (referent, men) were younger than 45 years, 1.30 (95% CI, 1.23-1.36); 45 to 54 years, 1.26 (95% CI, 1.22-1.30); 55 to 64 years, 1.24; 65 to 74 years, 1.13; 10and 75 years or older.

Diabetes was the most common risk factor diabetes (38.33%), hypertension (36.66%), CAD (13.33%), smoking (5%), and dyslipidaemia (6.66%). 5.33% of patients had single vessel, 35% of patients had double vessel, and 11.66% of patients had triple vessel. There was no significant difference in risk factor between the groups (P=0.440). Diabetes was the most common risk factor in each age group. There was no significant difference in ACS between the age group (P=0.896). In single vessel, >60 years was the most common age group followed by 51-60 years. In double vessel, 41-50 years was the most common age group followed by >60 years. In triple vessel, > 60 years was the most common age group followed by 51-60 years. In a study by Anthony et al, Diabetes mellitus (DM) was seen maximum in the age group 50-69 years old (p = 0.041), and hypertension (HTN) also showed a similar pattern with the maximum in the age group 50-69 years (p = 0.006). Another significant association was found between a family history of CAD and the occurrence of ACS, with the highest percentage in the 50-69 years age group (44.5%, p = 0.021). Obesity had the highest prevalence in the 50-69 years age group (p = 0.046). However, no significant associations were found between age and coronary artery disease (CAD), dyslipidemia, or smoking (p > 0.05).20 Ina study by Goodacre et al, Chest pain or a related complaint accounted for 6957 of the 115 620 emergency department attendances during the study period (6.0%) and 4438 of the 16 222 medical admissions (27.4%). The mean age of attendances was 57.1 years (range 13–100 years); 3834 (55.1%) were male; 764 (11.0%) had ECG evidence of ACS; 2402 (34.5%) had clinically diagnosed ACS; 869 (12.5%) had other potentially life threatening pathology; 1291 (18.6%) had negligible risk of life threatening pathology; and 1631 (23.4%) had undifferentiated chest pain. The mean age of those admitted was 64.1 years; 2308 (52.0%) were male; 713 (16.1%) had ECG evidence of ACS; 2155 (48.6%) had clinically diagnosed ACS; 814 (18.3%) had other potentially life-threatening pathology; 92 (2.1%) had negligible risk of life threatening pathology; and 664 (15.0%) had undifferentiated chest pain.[21]

Among the studied ACS patients, hypertension emerged as the most prevalent risk factor, with 99 cases (72.2%) affected by this condition. In addition, other common risk factors included coronary artery disease (52%), diabetes (51%), dyslipidemia (39.4%), family history (32.8%), smoking (5.8%), and obesity (3.6%). These findings align with previous studies that have identified smoking, hypertension, diabetes, obesity, and dyslipidemia as significant risk factors for the development of ACS.22,23 These risk factors were highest in the 50-69 age group, ranging from 44-72%.

Conclusion

The patterns of symptoms and risk variables associated with age in patients with ACS are clarified by this study. The results demonstrate the strong correlations between gender and ACS as well as age and ACS. There was a noteworthy correlation observed between the age range of 51-60 years and ACS. A noteworthy correlation was seen between the gender of men and ACS.

Table 1: Baseline Characteristics

Baseline Characteristics	Frequency (n=60)	Percentage (%)
Age group		
≤30 years	5	8.33%
31-40 years	8	13.33%
41-50 years	13	21.66%
51-60 years	15	25%
>60 years	19	31.66%
Gender		
Male	36	60%
Female	24	40%
BMI (kg/m2)		
Normal	17	28.33%
Underweight	9	15%
Overweight	24	40%
Obesity	10	16.66%
Family history		
Yes	41	68.33%
No	19	31.66%
Socio Economic status		
Lower class	25	41.66%
Middle class	22	36.66%
Upper class	13	21.66%

Table 2: Risk Factor

Risk factor	Frequency (n=60)	Percentage (%)
Diabetes	23	38.33%
Hypertension	22	36.66%
CAD	8	13.33%
Smoking	3	5%
Dyslipidemia	4	6.66%

Table 3: Acute coronary syndrome

Acute coronary syndrome	Frequency (n=60)	Percentage (%)
Single vessel	32	53.33%
Double vessel	21	35%
Triple vessel	7	11.66%

Table 4: Association between age and risk factor

Risk factor	Frequency (n=60)					P Value
	≤30 years	31-40 years	41-50 years	51-60 years	>60 years	
Diabetes	1	3	6	8	5	0.440

Hypertension	2	3	5	7	5	
CAD	1	1	2	0	5	
Smoking	1	1	0	0	1	
Dyslipidemia	0	0	1	0	3	

Table 5: Association between age and ACS

Age group	Acute coronary syndrome			P value
	Single vessel	Double vessel	Triple vessel	
≤30 years	3	2	0	0.896
31-40 years	3	4	1	
41-50 years	6	6	1	
51-60 years	9	4	2	
>60 years	11	5	3	

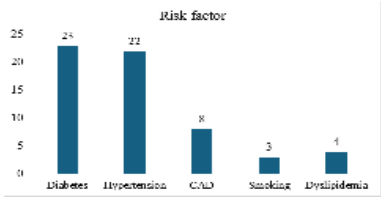

Figure 1: Risk factor

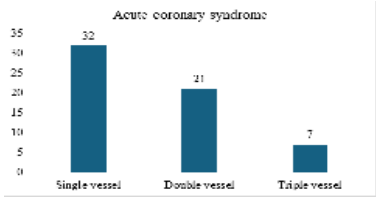

Figure 2: Acute coronary syndrome

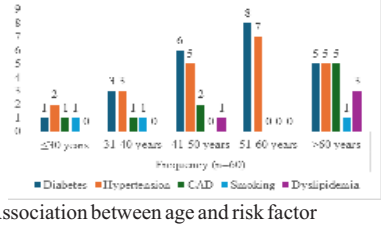

Figure 3: Association between age and risk factor

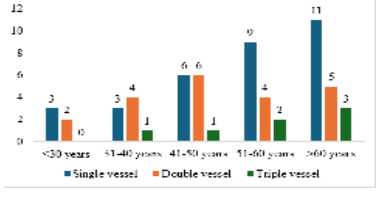

Figure 4: Association between age and ACS

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