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PREVALENCE AND RISK FACTORS OF ACUTE CORONARY SYNDROME IN YOUNG POPULATION

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Abstract:
Objective: One of the main reason of high rate of morbidity as well as mortality in the whole world is ACS (Acute Coronary Syndrome). Normally, this complication is not common among young persons in comparison with elder population of community. Main aim of this research work was to evaluate the prevalence rate, demographic traits and risk factors for ACS among patients having less than forty five years of age.
Methodology: This study is a transverse, retrograde research work. We recruited the patients with random sampling of the patients who got admission because of ACS in Jinnah Hospital, Lahore from March 2016 to December 2019. The collection of the data and its analysis carried out. Comparison of the patients having less than forty five years of age carried out with the patients having greater than forty five years of age.
Result: A sum of total 628 patients were the participants of this research work. The prevalence of ACS in young population with ACS was 6.10%. The average age of these patients was 39.0 ± 6.0 years. The diagnosis of all the young patients of ACS carried out with the unstable angina and NSTEMI (Non-ST Elevation Myocardial Infarction). Habit of cigarette smoking and past history of diseases of coronary artery in the family were very common in the young patients of ACS. There were 59.50% young patients of ACS who were addicted to smoking, whereas 37.80% and 51.40% among them were suffering from DM (Diabetes Mellitus) and HTN (Hypertension) correspondingly. Smokers of tobacco, DM and HTN displayed important association with the onset of ACS in young population ($P \leq 0.050$).
Conclusion: Three most important risk factors (cigarette smoking, DM and HTN) had been displayed to have significant association with the onset of ACS in young population. So, it is vital to detect these factors and the implementation of strict measures are necessary to handle these factors for the prevention of the progression of diseases of coronary artery.
KEY WORDS: Diabetes mellitus, correspondingly, prevalence, retrograde, transverse, ACS, coronary, artery, prevalence, association, NSTEMI.

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INTRODUCTION:

One important reason of high rate of mortality in whole world is IHD (Ischemic Heart Disease) in accordance with the findings of WHO in 2012 [1]. In our country Pakistan, CAD (Coronary Artery Disease) is very important reason of high rate of mortality and it is accountable for 15% to 20% of deaths in hospitals [2]. Clinical spectrum of IHD is ACS with a range from not stable angina, NSTEMI to STEMI. The prevalence of ACS is much low in population of young age as compared to the population of older age [3]. The incidence rate of ACS in population having less than forty or forty five year of age ranges from 2.0% to 10.0% on the basis of the research works conducted in various countries of the world [3-10].

Risk factors of cardiovascular complication like habit of cigarette smoking, obesity, hyperlipidemia, and past history of CAD in the family, has been detected more frequent in population of young age ACS patients in these research works [3-10]. Recently, there is scarcity of data on the prevalence rate and risk factors of ACS in young population of our country, Pakistan. This research work aimed to evaluate the rate of prevalence and associated risk factors for ACS in the patients having less than forty five years of age. This research work will provide fundamental data to conduct multi-center research work in our country, Pakistan in near future.

METHODOLOGY:

This is a transverse, retrograde research work conducted in a single center. All the patients having age of less than forty five year of age who got admission in hospital with ACS diagnosis from 2016 to 2019 were the participants of this research work. We used the method of random sampling for the selection of the patients. The collection of data also included the risk factors which were main contributors to prevalence of ACS among young population. The assessment of medical records of the patients carried out and we also recorded the characteristics of demography of all the patients.

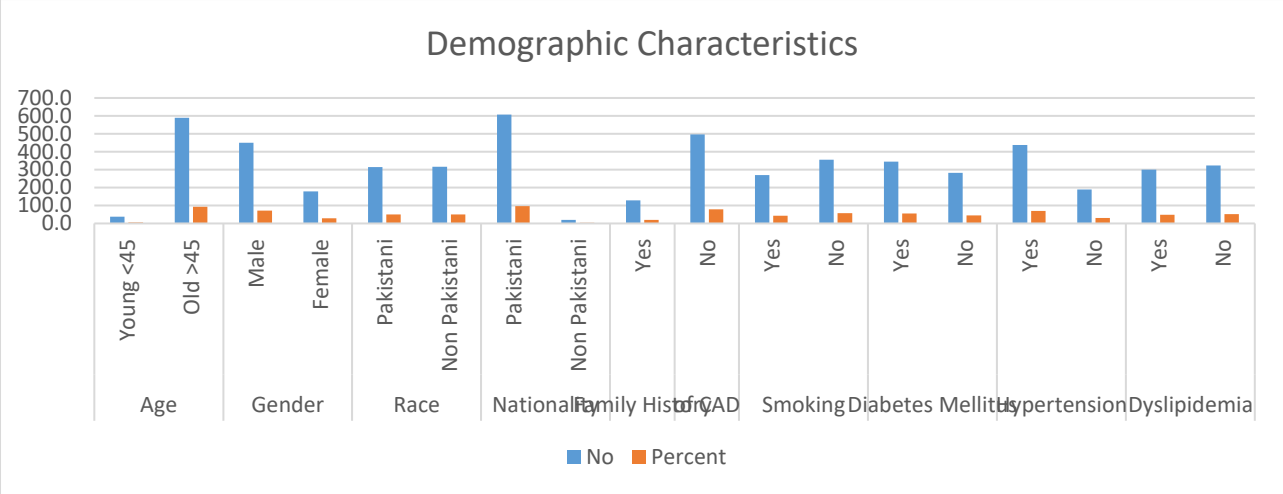
We also recorded the other medical information as the availability of comorbidities like DM (Diabetes Mellitus), HTN (Hypertension) and dyslipidemia, laboratory findings as well as imaging reports. The ethical committee of the Jinnah Hospital, Lahore gave the permission to conduct this research work. As this research work was a retrograde research work, therefore there was no need to get the permission of the patients. SPSS V. 23 was in use for the statistical analysis of the collected information. We used the descriptive statistics for the description of the collected data. We presented the categorical data in frequencies & percentages. We used averages and standard deviations for the representation of the continuous data. The analysis of the association between different variables carried out with the utilization of the Chi-square Test. P value of less than 0.050 was significant.

RESULTS:

The recruitment of total six hundred and twenty eight patients carried out in this research work. Table-1 is providing the characteristics of demography and baseline clinical traits of all the included patients.

Table-I: Distribution of demographic among patients with acute coronary syndrome in the hospital.

Demographics		No	Percent
Age	Young <45	38.0	6.10
	Old >45	590.0	93.90
Gender	Male	450.0	71.70
	Female	178.0	28.30
Race	Pakistani	314.0	49.80
	Non Pakistani	316.0	50.20
Nationality	Pakistani	608.0	96.30
	Non Pakistani	20.0	3.20
Family History	Yes	129.0	20.50
	No	497.0	79.10
Smoking	Yes	270.0	43.00
	No	356.0	56.70
Diabetes Mellitus	Yes	345.0	54.90
	No	283.0	45.10
Hypertension	Yes	438.0	69.70
	No	190.0	30.30
Dyslipidemia	Yes	301.0	47.90
	No	323.0	51.40



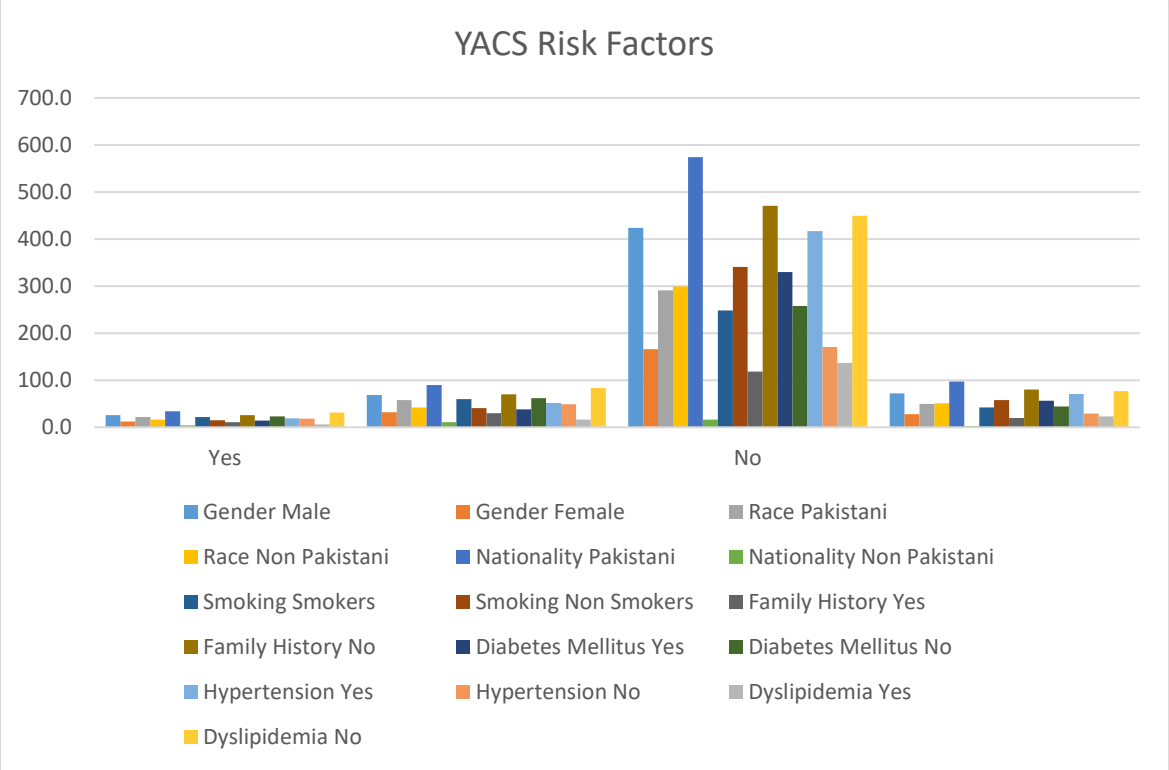
The relationship between ages of patients, various risk factors and ACS onset are present with illustration in Table-2 and Table-3 correspondingly. The prevalence rate of ACS in young population was 6.10% in our institute. The average age of the patients was 39.0 ± 6.0 years. We diagnosed all the young patients of ACS with NSTEMI and unstable angina.

Table-II: The association between age and YACS

Age	Young Acute Coronary Syndrome (YACS)				X^2	P value
	Unstable Angina					
	STEMI		NSTEMI			
	No	Percent	No	Percent		
Young (< 45)	38.0	100.00	0.0	0.00	11.286	0.0010
Old (> 45)	453.0	76.80	137.0	23.20	-	-

Table-III: The association between the risk factors with the onset of young ACS.

Variables		Young Acute Coronary Syndrome (YACS)				X^2	P value
		Yes		No			
		n	%	n	%		
Gender	Male	26.0	68.40	424.0	71.90	0.2080	0.6480
	Female	12.0	31.60	166.0	28.10		
Race	Pakistani	22.0	57.90	291.0	49.30	1.0490	0.3060
	Non Pakistani	16.0	42.10	299.0	50.70		
Nationality	Pakistani	34.0	89.50	574.0	97.30	NA	0.0270
	Non Pakistani	4.0	10.50	16.0	2.70		
Smoking	Smokers	22.0	59.50	248.0	42.10	4.2750	0.0390
	Non Smokers	15.0	40.50	341.0	57.90		
Family History	Yes	11.0	29.70	118.0	20.00	2.0000	0.1570
	No	26.0	70.30	471.0	80.00		
Diabetes Mellitus	Yes	14.0	37.80	330.0	56.10	4.7030	0.0300
	No	23.0	62.20	258.0	43.90		
Hypertension	Yes	19.0	51.40	417.0	70.90	6.3180	0.0120
	No	18.0	48.60	171.0	29.10		
Dyslipidemia	Yes	6.0	16.20	137.0	23.30	1.0000	0.3170
	No	31.0	83.80	450.0	76.70		



Male patients were more in number (68.40%) as compared to the female patients (31.60%). Among studied risk factors, habit of cigarette smoking (59.50%) and past history of family with CAD (29.70%) were very common in the young patients of ACS as compared to the patients of elder age. Conversely, there was very high prevalence rate of DM (56.10%), HTN (70.90%) and dyslipidemia (22.30%) in older patients. Habit of cigarette smoking, DM and HTN had shown a strong association with the onset of ACS in young population ($P \leq 0.050$).

DISCUSSION:

In this current research work, the prevalence of ACS among patients having less than forty five years of age was 6.10%. This outcome is much consistent with the rate of prevalence in various research works conducted in different countries with a range from 2.0% to 10.0% [3-10]. The average age of the patients of ACS was 39.0 ± 6.0 years in young population. In comparison with the population of older age, the rate of occurrence of ACS was much low in population of young age (6.10% vs. 93.90%). The population of older age had very high rate of occurrences of many risk factors as DM, HTN and dyslipidemia. These complications also increase the risk of the development of CVDs. There is high occurrence of ACS in young males as compared to females of young age. Among females, estrogen has capability to decrease the LDL (Low Density Lipoprotein) and restricts the aggregation of the platelets [11]. So, it lowers the risk of acquiring ACS in females.

There is also an important role of ethnic differences in the prevalence of this complication in young population, the prevalence of ACS is very high among Pakistanis (49.80%) and followed by Indians (24.40%) [12]. Hughes stated the high rate of mortality because of ACS among the Indians in this research work [13]. Chew also stated the high incidence rate of IHD among Indians complexed with DM [14]. This observation has the explanation that there is very high occurrence of DM among Indians [15]. The habit of tobacco smoking is one of the important risk factors responsible for ACS among young population according to various research studies [3-10] Exposure to smoking is the main reason of the damage of endothelial cells, causing endothelial dysfunction as well as vascular intima injury [16].

There is need of implementation of preventive measures to restrict the easy supply of tobacco to youngsters to reduce the prevalence of ACS among young population [17]. The past history of family of CAD has association with the enhanced risk of ACS among young population. The risk of acquiring ACS is very high among patients having past family history [18]. There are some genomic research work to suggest some abnormalities of chromosomes that are the main contributors to ACS onset [19]. DM and HTN are well-known most important risk factors for CADs. DM is diseases of metabolic disorder with clear complication on coronary blood vessels by advancing the atherosclerosis [20]. HTN promoted the hyperactivity among patients which advances the ACS onset and coronary spasm [21].

Lamb stated in his research work that adverse diabetic control was accountable for the onset of ACS among young population regardless of the prevalence rate among young populations [22].
The manifestation of dyslipidemia carried out by elevation of TC (Total Cholesterol), LDL-C (Low Density Lipoprotein-Cholesterol), and TG (Triglycerides) with decreased level of HDLC (High Density Lipoprotein Cholesterol) [23]. The research works conducted by Schoenenberger and Uranga had displayed an important relationship between dyslipidemia and onset of ACS among young population [9, 24].

CONCLUSION:

Three most important risk factors which are responsible for ACS in young population are habit of cigarette smoking, HTN and DM. It is much vital to detect these risk factors. It is also important to implement the timely measures in handling these risk factors to prevent or stop the progression of various complications of coronary artery.

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