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Risk Factors and Pattern of Coronary Artery Involvement in Young Acute Coronary Syndrome Cardiac Patients: A Study in National Institute of Cardiovascular Diseases and Hospital, Dhaka, Bangladesh

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Abstract **Original Research Article**

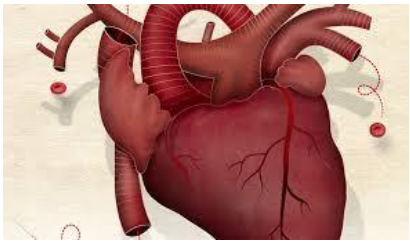
Aims: To match the rick factors and pattern of coronary artery involvement in young acute coronary syndrome patients thereupon of the old. ***Objective:*** To assess the Risk Factors and Pattern of Coronary Artery Involvement in Young Acute Coronary Syndrome cardiac Patients. ***Methods:*** This was a cross sectional analytical study done in the Department of Cardiology, National Institute of Cardiovascular Diseases and Hospital (NICVD), Dhaka, Bangladesh throughout Nov 2017 to 2018. **Results:** The present study intended to compare the risk factors and coronary artery involvement between younger and elder ACS included a total of 101 patients. Of them 51 were £50 years and considered as young (case) and 49 were above 50 years were older (control). Males and females were 76 and 25 respectively. The mean ages of the younger and the elder group were 38.6 ± 4.3 and 58.9± 8.7 years respectively, while the mean ages of the males and females 49.0 ± 12.7 and 45.9 ± 10.4 years respectively. Study population was divided into 2 subgroups, those 18-50 years were thought of as young and people >50 years were thought of as old. Young patients had bigger prevalence of smoking, dyslipidemia and positive case history of anemia heart condition (IHD), whereas cardiovascular disease was additional prevailing within the old. Younger patients principally conferred with STEMI and preponderantly had single vessel sickness (SVD), whereas old patients oft conferred with NSTEMI and Unstable angina and had higher incidence of double vessel sickness (DVD) and triple vessel sickness (TVD). ***Conclusion:*** Younger patients had a unique pattern of risk factors and coronary artery involvement in comparison to the old.

Keywords: Young adult, Acute Coronary Syndrome, Coronary Angiography, Bangladesh.

INTRODUCTION

Coronary artery sickness could be a world pathological state reaching a pestilence proportion in each developed and developing countries and is that the leading reason behind mortality and morbidity worldwide [1, 2]. In 1990 coronary artery sickness accounted for 28% of world's 50.4 million deaths and 9.7% of the 1.4 billion lost incapacity adjusted life years. By 2020 the world's population can grow to 7.8 billion and thirty second of all deaths are going to be caused by arteria [3]. The South Asian countries have among the very best incidence of coronary artery sickness globally [4]. Estimates from the world burden of sickness study suggests that by the year 2020, this a part of the globe can have a lot of people with atherosclerotic arteriosclerosis arterial sclerosis hardening of the arteries induration of the coronary-artery sickness artery disease than in the other region [4, 5]. Knowledge associated with totally different aspects of CAD in Bangladesh are inadequate however it's extremely current in Bangladesh [6]. South Asian populations have Associate in Nursing accumulated risk and 5-10 years earlier onset for acute infarct compared

to the western population. In recent years the frequency of acute infarct in young people is accumulated [4, 7, 8]. Like different South Asians, Bangladeshis are unduly susceptible to develop CAD, that is commonly premature in onset [6].



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OBJECTIVE

- To assess the risk factors and Pattern of Coronary Artery Involvement in Young Acute Coronary Syndrome Cardiac Patients.

METHODS

This was a cross sectional analytical study done in the Department of Cardiology, National Institute of Cardiovascular Diseases and Hospital (NICVD), Dhaka, Bangladesh during November 2017 to October 2018. All patients 18 yrs and above with acute coronary syndrome admitted in CCU during the specified period were included in this study considering the inclusion and exclusion criteria. Inclusion criteria were ACS patient's ≥18 yrs. and in whom CAG could be done. Exclusion criteria were patient's with concurrent valvular or congenital heart disease, cardiomyopathy, CKD, cerebro-vascular disease and old MI. They were further divided into 2 groups based on their age. Patients 18-50 yrs were considered as young and those >50 years were considered as elderly.[4]Informed written consent was taken from the selected patients. Initial evaluation of patients was done by history taking and clinical examination and were duly recorded. Demographic information, such as, age, sex and measure information like height (cm) and weight (kg) were recorded. Presence of risk factors of ACS or risk factors according were conjointly noted. Pulse, BP and alternative important parameters were recorded. Troponin I level was measured at admission however not before 5 hrs from the onset of pain. Blood for screening DM was enamored patients fast a minimum of 8 hrs before giving the blood sample and a pair of hrs. When seventy five gram oral aldohexose load (in patients not confirmed by FBS and RBS), except for screening dyslipidemia fast just for 8 hrs would do satisfy. To judge urinary organ standing humor creatinine was assessed. Diagnostic procedure was done when admission of the patient. The mode of ACS presentation in each the teams were noted. Coronary X-ray photograph was done throughout admission or on follow up (within fourteen days) in spite of patient receiving less or not and was recorded. Information were processed and analyzed victimization SPSS (Statistical Package for Social Science) for Windows Version sixteen. The take a look at statistics accustomed analyze the info were descriptive statistics, Chi-square (Ç2) and odd t-test. While the categorical data were compared between groups using Chi-square Test, the data presented on continuous scale were compared between groups using unpaired t-test. The level of significance was set at 5% and $p < 0.05$ was considered significant.

RESULTS

The present study intended to compare the risk factors and coronary artery involvement between younger and elder ACS included a total of 101 patients. Of them 51 were £50 years and considered as young (case) and 49 were above 50 years were older (control). Males and females were 76(101) and 25 (101) respectively. The mean ages of the younger and the elder group were 38.6 ± 4.3 and 58.9± 8.7 years respectively, while the mean ages of the males and females 49.0 ± 12.7 and 45.9 ± 10.4 years respectively. Table 1: shows that over 70% of the case group and 80% of the control group were male with no significant intergroup difference (p = 0.220).

Table-1: Comparison of sex distribution of the study groups (N=101)

Sex Distribution	Group		p value*
	Case (≤50years)	Control (>50 years)	
	(n = 51)	(n = 49)	
Male	37(72.5)	41(83.6)	0.220
Female	14(27.5)	8(16.4)	

*Data were analyzed using Chi-square test.

Table-2: Comparison of lifestyle and BMI of the study groups (N=101)

Variables	Group		p value*
	Case (≤50years)	Control (>50 years)	
	(n = 51)	(n = 49)	
Lifestyle	0.952	0.00	
Active	10(19.6)	8(16.3)	
Sedentary	41(80.4)	41(83.7)	
BMI (kg/m^2)	0.240		
Under weight	3(5.8)	2(4.0)	
Normal BMI	15(29.4)	21(42.8)	
Over weight	20(29.2)	21(42.8)	
Obese	11(21.5)	5(10.2)	

Morbidly obese	2(3.9)	0(0.0)	

*Data were analyzed using Chi-square test.

Table-2 shows majority of the patients in both case and control groups (79.3 and 78.8% respectively) were accustomed to sedentary life-style, the difference was not statistically significant (p = 0.952). Over half of the patients in both case and control groups were overweight or obese (58.6 and 51.9% respectively). The groups were almost identical in terms of BMI (p = 0.240).sedentary lifestyle was defined as daily engagement of at least 30 minutes or more in moderate to severe exercise [9].

Table-3: Comparison of clinical presentation of the study groups (N=101)

Clinical	Group		p value*
Presentation	Case (≤50years)	Control (>50 years)	
	(n = 51)	(n = 49)	
STEMI	22(43.1)	11(22.4)	
NSTEMI	15(29.4)	17(34.6)	0.021
UA	14(27.4)	21(42.8)	

*Data were analyzed using Chi-square (test).

Table-3 shows while STEMI was considerably higher in the case group compared to the control group, NSTEMI.

Table-4: Comparison of risk factors of the study groups (N=101)

Cardiovascular	Group		p value*
Risk Factors	Case (≤50years)	Control (>50 years)	
	(n = 51)	(n = 49)	
Smoking*	34(58.6)	20(38.4)	0.035
DM*	17(29.3)	19(36.5)	0.420
HTN*	25(43.1)	36(69.2)	0.006
Dyslipidemia*	41(70.7)	24(46.1)	0.009
Family H/o IHD*	30(51.7)	12(23.1)	0.002

*Data were analyzed using Chi-square test.

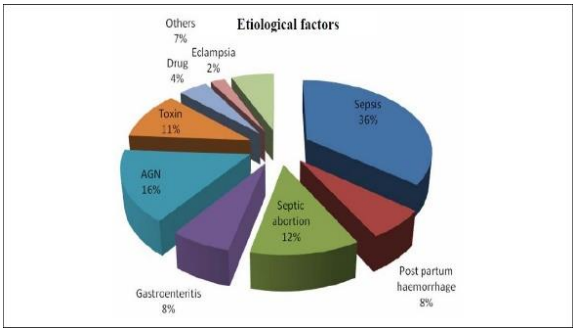

Fig-1: Causes of acute renal failure in the study patients

Table-5: Comparison of biochemical findings of the study groups (N=101)

Biochemical	Group		p value*
variables[#]	Case (≤50year)	Control (>50 years)	
	(n = 58)	(n = 52)	
FBG (m.mol/L)	7.1 ± 3.7	6.0 ± 1.7	0.054
RBG (m.mol/L)	7.4 ± 3.2	7.3 ± 1.8	0.776
Serum creatinine (mg/dl)	0.98± 0.7	0.97 ± 0.1	0.945
Total cholesterol (mg/dl)	200.6± 49.3	200.2 ± 28.8	0.957
Serum LDL-C (mg/dl)	130.3± 42.2	114.6 ± 28.8	0.026
Serum HDL-C (mg/dl)	36.6± 4.2	37.0 ± 4.3	0.646
Serum TG (mg/dl)	227.0 ± 134.8	176.3 ± 65.2	0.015

#Data were analyzed using unpaired t-test and were presented as mean ± SD.

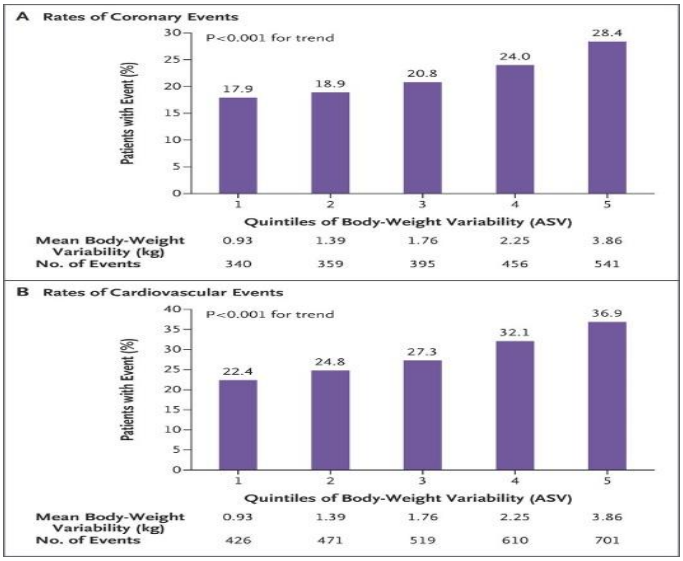

Fig-2: Body-Weight Variability and Rates of Coronary and Cardiovascular Events as a Function of Baseline Body-Mass Index

BMI denotes body-mass index (the weight in kilograms divided by the square of the height in meters), and BMV body-weight variability. Normal weight is defined as a BMI of less than 25, overweight a BMI of 25 to less than 30, and obesity a BMI of 30 or higher.

Table-6: Comparison of angiographic profile of the study groups (N=101)

Angiographic profile	**Group**		**p value***
	Case (≤ 50 years)	Control(>50yea)	
	(n = 51)	(n = 49)	
Site of lesion*			
LM	3(5.2)	2(3.8)	0.739
RCA	28(48.3)	38(73.1)	0.008
LAD	28(48.3)	45(86.5)	<0.001
LCX	16(27.6)	42(80.8)	<0.001
Severity of lesion[#]			
Occlusion in LM (%)	67.2 ± 29.5	69.6 ± 29.5	0.919
Occlusion in RCA (%)	86.4 ± 15.5	79.3 ± 23.2	0.165
Occlusion in LAD (%)	80.5 ± 18.9	85.34 ± 14.0	0.209
Occlusion in LCX (%)	83.1 ± 16.1	80.4 ± 23.5	0.657
No. of vessels involved*			
SVD	21(41.1)	9(28.3)	<0.001
DVD	9(17.6)	20(40.8)	
TVD	7(13.7)	20(40.8)	
None	14(27.4)	0(0.0)	

*Data were analyzed using Chi-square; figures in the parentheses denote percentage.

Data were analyzed using unpaired t-test and were presented as mean ± SD and unstable angina were much higher in the latter group, this difference was statistically significant (p = 0.021). NSTEMI was differentiated from UA by having elevated Troponin-I. Table 4: shows risk factors distribution in younger ACS patients had significantly higher prevalence of smoking, dyslipidemia and family history of IHD compared to the elder group (p = 0.035, p = 0.009 and p = 0.002 respectively).In contrast, hypertension demonstrated their significant presence in the latter group compared to that in the former group (p = 0.006). Table V shows comparison of pertinent biochemical variables reveals that FBS was relatively high in the case group than that in the control group (p = 0.054). The level of serum LDL and serum triglycerides were significantly elevated in the former group than those in the latter group (p = 0.026 and p = 0.015 respectively). Table-6 shows that in younger patients RCA and LAD were commonly involved (48.3% cases) than the LCX (27.6%), where as in elder patients all the major coronary arteries were almost equally involved. Site of lesions were more in elder group than that in younger group. However, in terms of percentage of occlusion, no significant difference was observed between the groups with respect to any of the major coronary arteries. While SVD was common in the case group, DVD and TVD were prevalent in the control group which was statistically significant (p < 0.001).

DISCUSSION

In the present study majority of the ACS patients in either group were male although earlier studies reported that ACS occurs more in males than in females in younger age [10, 11]. CAD is much less frequent in premenopausal women due to the effect of estrogen; as the protection from CAD is much less evident after menopause, the disease affects both sexes equally [12]. In a recent study however, researchers have found that young women who are current smoker and obese are more likely to suffer from ACS [13]. Among the conventional risk factors smoking, dyslipidemia and positive family history of IHD were the most prevalent cardiovascular risk factors (CVRFs) in the younger patients (58.6, 70.7 and 51.7% respectively) which was statistically significant ($p = 0.035$, $p = 0.009$ and $p = 0.002$ respectively). Whereas hypertension was the most prevalent established CVRF in the elderly group (69.3%) which was statistically significant ($p = 0.006$). In terms of clinical presentation, STEMI was the most common form of ACS in younger group (48.3%), whereas NSTEMI and UA were significantly higher in the older group (36.5 and 40.4% respectively) ($p = 0.021$).Several studies have shown that STEMI is the most common form of ACS in young. Bhattacharjee *et al*., [14] in a recent study found that STEMI is significantly more common in younger patients. In a Thai ACS Registry study, 67% young ACS patients had STEMI [15]. On the other hand, NSTEMI and UA have been reported to be more common in the elderly [16, 17]. Similar finding has been observed by another group where majority (70%) of the young patients with ACS presented with STEMI [18]. Mean FBG was relatively high in the case group than that in the control group ($p = 0.054$). Serum LDL-C and serum triglycerides levels were significantly higher in the former group than in the latter group ($p = 0.026$ and $p = 0.015$, respectively).The study demonstrates that younger patients have lesser number of coronary artery involvement and less severe disease (in terms of percentage of occlusion and number of vessels involved) compared to elderly($p = <0.001$). They also have fewer complications than the older cohorts in terms of cardiogenic shock and recurrent angina than their older counterparts ($p = 0.023$ and $p < 0.001$ respectively). This study showed that younger patients have lesser variety of coronary artery involvements and fewer severe malady (in terms of share of occlusion and variety of vessels involved) compared to the aged. They even have less complications than their older counterparts. In keeping with these findings showed prevalence of vessels involvement and SVD to be considerably higher in younger ACS patients whereas multi-vessel malady is additional common within the aged. Similar findings are rumored by alternative authors [19, 20]. The less intensive CAD ascertained in younger patients in our study would possibly counsel that premature CAD is related to fast malady progression instead of with a step by step evolving method. This can be in agreement with the finding that ACS is that the common initial presentation in younger patients [21]. The study had few limitations together with tiny sample size and one center study. Syntax organismic scores indicating severity of the involvement of the coronary arteries and Medina Classification indicating the sort of lesion haven't been enclosed within the study as a variable. Due to resource constraint we tend to couldn't embody the rising vessel risk factors like blood serum homocystine, high sensitivity serum globulin, blood serum L-P (a), Chlamydia pneumonia immune serum globulin protein, fat-soluble vitamin level.

CONCLUSION

Younger ACS patients had considerably higher prevalence of smoking, dyslipidemia and case history of IHD compared to the elder cluster, whereas aged ACS patients were additional vulnerable to be related to cardiovascular disease. Young ACS patients oftentimes bestowed with STEMI and single vessel illness whereas aged patients oftentimes bestowed with NSTEMI and UA with additional severe and intensive CAD. At the tip of this study we have a tendency to suggest early risk stratification, identification of the illness and its management could stop fatal outcomes in an exceedingly sizable amount of cases. significantly smoking surcease within the younger population is powerfully advocated to lower the ACS risk, any large-scale multicenter study is required to elucidate the roles of those risk factors so applicable political opinions and public health measures is taken to forestall premature CAD within the teenagers.

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Conflict of interest: The Author no conflict of interest.

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