

Demographic, Clinical and Coronary Angiographic Profile of Bangladeshi Expatriates Coming from Middle-East

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ABSTRACT

Background & objective: Middle East (ME) countries bear a heavy burden of coronary artery disease (CAD). A good number of Bangladeshi workers every year go to ME countries for earning their livelihood. To accustom with the changed working environment of the new country, they have to change their life-style, which among others includes food behavior as well. As such they become more vulnerable to non-communicable diseases or their risk factors like, diabetes, hypertension, dyslipidaemia and CAD than ever before. A sizable portion of these workers when return to their own country carry coronary artery diseases (CADs) at an unusually low age. But the health issues of the Bangladeshi expatriates in ME are yet not well reported. This study investigates if Bangladeshi workers while staying in ME countries are accustomed to unhealthy life-style which pushes them to increased risk for CADs.

Materials & Methods: This cross-sectional study was conducted on 79 male Bangladeshi expatriates in ME with CAD who underwent coronary angiogram (CAG) in Ibrahim Cardiac Hospital and Research Institute (ICHRI) in the year 2015. Detailed demographic, behavioural (particularly food behavior during their stay in ME) clinical and angiographic profile of these patients were studied. The risk factors studied were life-style, BMI, smoking habit, presence of diabetes, hypertension, dyslipidaemia and family history of CAD. The outcome variable was severity of CAD in terms of single, double and triple vessel diseases.

Results: The mean age the study subjects were 47.8 ± 8.5 years. Over half (53%) belonged to low income family and 73.4% were secondary or below secondary level educated. Among them 63.3% were diabetics, 58.2% hypertensive, 59.9% dyslipidaemic, 34.2% current smoker and 54.4% overweight or obese. Over 40% used to take food at restaurant regularly or frequently with 27% having excessive carbohydrate and 30% excessive fatty food including the traditional fatty meal 'Kapsa'. These patients presented with stable angina (40.5%), unstable angina (8.9%) or had history of myocardial infarction (50.7%). Coronary angiogram revealed 43.0% with single vessel disease (SVD), 27.9% double vessel disease (DVD) and 29.1% triple vessel disease (TVD). Prevalence of smoking was significantly higher in TVDs (56.5%) than that in DVDs (27.3%) and SVDs (23.5%) ($p = 0.043$). Diabetes was also more frequently associated with TVDs than do with DVDs and SVDs ($p = 0.007$).

Conclusion: Adopting healthy life-style and early screening and management of cardiovascular risk factors in these expatriates is crucial for long term favorable outcome.

Key words: Demographic profile, clinical profile, coronary angiogram, Bangladeshi expatriates, Middle East etc.

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INTRODUCTION

Coronary artery Disease is the leading cause of mortality and morbidity worldwide. Although mortality rates due to CAD have declined over the last four decades in United States^{1,2} the ME countries still bear a heavy burden of CAD.³ The ME people now present with CAD at much lower age in comparison to other regions specially Western Europe³. A substantial proportion of these patients are expatriates specially from Indian subcontinent.⁴ Recently a sizable portion of these Bangladeshi expatriates are coming to ICHRI with multiple cardiovascular risk factors or symptoms related to CAD at relatively younger age. Other than the conventional risk factors, unhealthy life-style due to low socio-economic background and inadequate education may contribute to the development of CAD.⁵ But the health issues and risk factors contributing to early onset of CAD among Bangladeshi expatriates in ME have not been specifically studied. This study hypothesized that besides the conventional CAD risk factors if Bangladeshi workers while staying in ME countries are accustomed to unhealthy life-style which is contributing to increased risk for CADs.

MATERIALS & METHODS:

This cross-sectional study was conducted on 79 Bangladeshi expatriates living in the ME, who presented to ICHRI with signs and symptoms of CAD over a period extending from 1st January to 31st December, 2015. The study was approved by the Ethical Review Committee of the Hospital and informed written consent was taken from all patients who underwent coronary angiography (CAG), and were subsequently managed as per guideline recommendations. Variables comprising of demographics, presenting symptoms, physical signs, biochemical tests, ECG changes, echocardiography and the coronary angiographic profiles were recorded for all subjects in a pre-designed structured data collection form. Data were analyzed using SPSS (Statistical package for social science), version 17 (SPSS Inc., Chicago, IL, USA). The test statistics used to analyze the data were Chi-square (χ^2) Test and Unpaired t-Test. Data presented on categorical scale were compared between two groups using Chi-square (χ^2) Test,

while the data presented on continuous scale were compared between groups using Unpaired t-Test. For all analytic tests, the level of significance was set at 0.05 and p-value < 0.05 was considered significant

RESULTS:

Majority of the male Bangladeshi expatriates participated in the study was from Saudi Arabia (n=53). The mean age of the patients was 47.8 ± 8.2 years. Over half (53%) of them belonged to low income families, and 73.4% were secondary or below secondary level educated. Approximately 64% of the subjects were diabetic, 58.2% hypertensive, 60% dyslipidaemic, 34.2% current smoker and 54.4% overweight or obese. In approximately 90% of these cases, diabetes, hypertension and dyslipidaemia were detected after they migrated overseas. Over half (50.7%) of the study population had history (recent or prior) of myocardial infarction; of them 7.6% had to undergo PCI and 1.3% CABG (Table I). Only 24% of the study population has family history of CAD. About half (49.3%) of the study subjects were involved in a job for which they have to do moderate (equivalent to 61-120 min walk) to severe (more than 120 min walk) work and only 21.5% were sedentary worker. Over 30% reported a habit of taking daily meals from restaurants, while 35% failed to take meals at regular hours. Over one-quarter (26.6%) of these expatriates reported an excessive intake of carbohydrates and 30.4% excessive intake of fatty food, including the fast foods and traditional fatty meal 'Kapsa' (Table II) The entire study subjects were married but living alone there, with majority reporting stressful lifestyles related to work, and deprivation of family life. More than half (50.7%) of the patients presented for CAG with a history of myocardial infarction, while 8.9% presented with unstable angina and 40.5% presented with stable angina (Table III). Coronary angiographic profiles revealed that 43% of the patients had single vessel disease (SVD), while 27.9% had double vessel disease (DVD) and 29.1% had triple vessel disease (TVD) (Fig:1). Diabetics and smokers demonstrated their significant presence in TVDs than those in DVDs and SVDs (p = 0.007 p = 0.043) (Table IV).

TABLE I : Demographic variables of the study population (n =79)

Demographic & baseline characteristics	Frequency	Percentage	Mean ± SD
Mean age (yrs)	---	---	47.8±8.5
Social status			
Rich	1	1.3	---
Upper middle class	36	45.6	---
Lower middle class	42	53.2	---
Educational status			
Under SSC	35	44.3	---
SSC	23	29.1	---
HSC	14	17.7	---
Graduate or higher	7	8.9	---
Risk factors			
DM	50	63.3	---
HTN	46	58.2	---
DL	47	59.5	---
Current smoker	27	34.2	---
Family history of IHD	19	24.1	
BMI			
Normal	35	44.3	---
Obese	12	15.2	---
Over weight	31	39.2	---
Under weight	1	1.3	---
Past cardiac history			
Prior MI	40	50.7	---
Prior PCI	6	7.6	---
Prior CABG	1	1.3	---

TABLE II: Life style of the study population.

Life style	Frequency	Percentage
Physical exercise		
Sedentary	17	21.5
Light	23	29.1
Moderate	31	39.2
Heavy	8	10.1
Daily food intake		
At home	46	58.2
Occasionally at restaurant	9	11.4
Regularly at restaurant	24	30.4
Food Habit CHO		
Low	3	3.8
Normal	55	69.6
Excessive	21	26.6
Protein		
Low	2	2.5
Normal	51	64.6
High	26	32.9
Fat		
Low	12	15.2
Normal	43	54.4
High	24	30.4
Vegetables		
Occasional	37	46.8
Regular	42	53.2
Fruits		
Occasional	40	50.6
Regular	39	49.4
Fast food or Kapsa		
Occasional	61	77.2
Regular	18	22.8

TABLE III: Indication of CAG (n=79)

Indication CAG	Frequency	Percentage
STEMI	15	19.0
NSTEMI	9	11.4
UA	7	8.9
SA	32	40.5
OMI	16	20.3

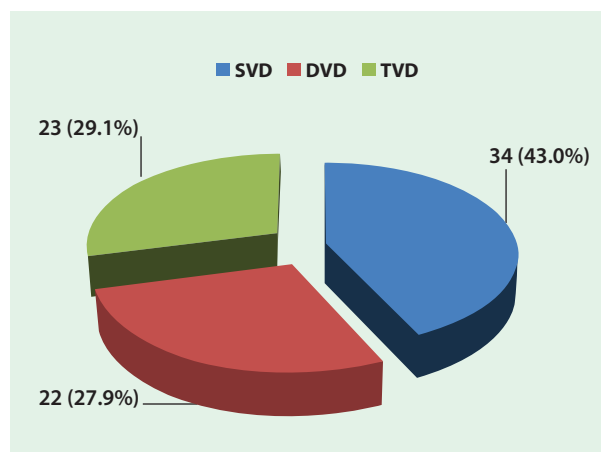


Fig. 1: Coronary angiographic profile of the study subjects (n =79)

TABLE IV. Association severity of CAD and traditional risk factors

Coronary angiographic profile	Group			p-value
	SVD (n = 34)	DVD (n = 22)	TVD (n = 22)	
HTN	19(55.9)	10(45.5)	17(73.9)	0.144
DM	15(44.1)	16(72.7)	19(82.6)	0.007
DL	21(61.8)	13(59.1)	13(56.5)	0.924
Smoking	8(23.5)	6(27.3)	13(56.5)	0.043
Regular intake of Fast-food or Kapsa	6(17.6)	5(22.7)	7(30.4)	0.529

DISCUSSION:

Bangladeshi population appears to share with other South Asian populations the undue susceptibility to CAD which is also premature in onset, clinically aggressive and angiographically extensive.⁶ Though the underlying pathophysiology is not known other than the conventional risk factors, genetic predisposition and high prevalence of metabolic factors may play important role in the web of causation of early onset CAD.⁷ Several studies, however, found association of

apolipoprotein E apoE genotype with the incidence of coronary syndrome in south Asian population.⁸ The mean age of our study population was found to be much lower (47.8 ± 8.2 years) and it was significantly lower than the other Bangladeshi patients who underwent CAG in the same period of time (55.1 ± 10.3 years). This is consistent with the findings by Ferwana⁹, who found South Asian ACS patients in Saudi Arabia to be younger than native Saudi Arabian patients. The prevalences of diabetes and hypertension (63.5% and 58.2% respectively) in the study subjects were, however, not significantly different from other patients who underwent CAG in our hospital during the same period of time. The detection of these co-morbid conditions after migrating overseas in 90% of the cases may reflect a consequence of lifestyle changes in the Middle Eastern environment. Diabetes is already a well-established risk factor of cardiovascular disease and diabetic vascular disease is responsible for 2-4 fold rise in the occurrence of CAD.¹⁰ In our study diabetes tend to be associated with TVDs more often than the DVDs and SVDs ($p = 0.007$) which compares well with the finding by Swami et al¹¹ who showed that severity of CAD as assessed by Gensini Score was higher in subjects with diabetes when compared to non-diabetic Indian subjects. Among the CAD patients only 34.2% were current smoker, but the prevalence of smoking was significantly higher in TVDs (56.5%) than that in DVDs (27.3%) and SVDs (23.5%) ($p = 0.043$). These findings also match well with those of Ferwana⁹ that smoking is one of the major causes of CAD in the early onset of the disease among South Asians.

Nearly half of the study subjects was involved in such jobs where they had to do moderate to severe work, but their dietary habit was not healthy. A good number of the study subjects (30%) used to take food from restaurant regularly which contains potentially harmful dietary fats, that is saturated fat and trans fat, although severity of CAD in this study was not found to be associated with fat intake or dyslipidaemia. In the meta-analysis by De Souza and his colleagues¹² a reliable and strong positive associations between trans-fat intake and coronary heart disease (CHD)

and mortality caused by it was found. They found a 2-fold increase in energy from trans-fat to be associated with a 25-fold increased risk of CHD and 31-fold increase in CHD mortality which was consistent with conclusions of two other meta-analyses.^{13,14} Despite the well-established fact that dietary saturated fat intake leads to increase low-density lipoprotein (LDL) cholesterol and thereby associated with increased risk of cardiovascular disease (CVD), the relationship of saturated fat intake to atherosclerotic CVD remains controversial.¹⁵ The systemic review and meta-analysis by De Souza and his colleagues¹² did not find any association of saturated fat intake with all cause mortality (relative risk 0.99, 95% confidence interval 0.91 to 1.09), CVD mortality (0.97, 0.84 to 1.12), total CHD (1.06, 0.95 to 1.17), ischemic stroke (1.02, 0.90 to 1.15), or type 2 diabetes (0.95, 0.88 to 1.03). But another meta-analysis which included 15 randomised controlled trials (RCTs) (17 comparisons, 59,000 participants) suggested that reducing dietary saturated fat reduced the risk of cardiovascular events by 17% [(risk ratio (RR) 0.83; 95% confidence interval (CI) 0.72 to 0.96].¹⁶ Some intervention trials have also shown modest cardiovascular benefits of reducing intake of saturated fat while increasing intake of polyunsaturated fat.¹⁷ Depending on these findings dietary guidelines recommend that saturated fats should be limited to <10% (5-6% for those who would benefit from lowering of LDL cholesterol), and trans fats to <1% of energy or as low as possible,¹⁸⁻²³ primarily to reduce risk of ischemic heart disease and stroke. Our entire study subjects live without family under severe psychological stress which might have adversely affected their cardiovascular health and quality of life. Studies have shown that CAD is common in individuals prone to chronic stress and by learning stress management, cardiac-related events can be significantly reduced.²⁴

CONCLUSION:

Bangladeshi expatriates living in the ME present with CAD at a relatively early age, with clustering of risk factors of CAD, particularly diabetes and smoking. Furthermore, poor dietary habits, and

stressful lifestyles with deprivation from family lives could be additional contributing factors to this early onset and increased severity of CAD. This is evident by the finding of significantly greater incidence of TVD among diabetics and smokers. Although it is difficult to draw conclusions as to whether this subset of the population was more prone to the risk of CHD due to their work in the ME, the detection of risk factors such as diabetes and hypertension only after their migration to the ME suggest that adoption of unhealthy lifestyle might have influenced the early onset of CAD among them. There is also a need for more detailed data on the epidemiology of CAD among Bangladeshi workers in the ME, particularly relating to risk factor status prior to their migration.

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