

DETERMINATION OF RELATION OF GENDER VARIATION IN AGE AND CARDIAC RISK FACTORS IN UNSTABLE ANGINA IN BANGLADESHI POPULATION

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Summary

The incidence of Unstable Angina is increasing. More than 80% of CAD is attributed to different modifiable cardiac risk factors. Evidence of effect of sex on different cardiac risk factor and as well as effect of age in different sex for CAD is still limited and needs evaluation. An observational case series study conducted on 50 consecutive cases following appropriate inclusion and exclusion criteria in the Department of Physiology, Chittagong Medical College in collaboration with CCU of Chittagong Medical college Hospital from September 2006 to July 2008. The cases of unstable angina were diagnosed on the basis of clinical criteria and ECG findings. Serum Troponin I level were estimated to exclude Non-STE MI. There were statistically significant difference of cardiac risk factors (smoking, hypertension and diabetes mellitus) with sex variation (p value < 0.05) Smoking habits were less in female, hypertension and diabetes detected more in female. This study concludes that significant difference of cardiac risk factors and age difference in both sexes may explain the outcome of UA in female.

Key words

Unstable angina; coronary artery disease; cardiac risk factors

Introduction

Unstable Angina (UA) may be defined as an acute process of myocardial ischemia that is not of sufficient severity and duration to result in myocardial necrosis¹. Traditionally, Coronary Heart Disease (CHD) has been considered as a disease predominantly affecting men and for a long time women were not included in cardiovascular research program.

Although the lifetime risk of CHD is one in three for women, they are still not fully aware of their risk of CHD. In the early 1990 more attention was focused on women with CHD. Since then an increasing number of studies have been published concerning cardiovascular health. Several studies reported the existence of gender difference in the use of diagnostic and therapeutic procedures for CHD. Women were less likely to be referred for diagnostic and therapeutic procedures. Also the prognosis for women with CHD was worse than men. Although most risk factors contribute to CHD in both men and women the impact of individual risk factors might be different. Data suggest that certain risk factors like smoking, diabetes, dyslipidemia and hypertension confer a higher relative risk of myocardial infarction in women than men². Coronary artery disease is the leading cause of death in women and the mortality rate was nearly three times higher than that of male³.

There is a marked difference in coronary heart disease (CHD) risk between sexes. Among middle-aged people, CHD is 2 to 5 times more common in men than in women, and this sex ratio varies between populations. In both sexes, the risk of CHD increases markedly with age. Hypertension, smoking, lipid abnormalities and diabetes are major risk factors for CHD. The role of major cardiovascular risk factors in the development of CHD is well established among men. Among women, the data are less extensive. Reasons for the sex difference in CHD risk are not fully understood. Very limited data are available to assess the extent to which cardiovascular risk factors can explain the observed sex difference in CHD risk^{4,6}.

Materials and methods

This study was performed on fifty patients of unstable angina in the Department of Physiology, Chittagong Medical College in collaboration with Coronary Care Unit (CCU) of Chittagong Medical College Hospital. The cases of unstable angina were diagnosed on the basis of clinical criteria and ECG findings. A random access sampling by inclusion and exclusion criteria of hospital admitted patients of unstable angina was done to carry out the study.

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The selection of the patients were based on UA with any one of these criteria: 1) No ST-segment elevation in ECG, 2) normal ECG and 3) ST-segment depression or T wave inversion in ECG. Patients were excluded with any one of these criteria: 1) ST-segment elevation in ECG, 2) onset of chest pain more than 10 days, 3) history of non cardiac disease such as peptic ulcer, cholecystitis, musculoskeletal pain etc. 4) chest pain by trauma 5) previous history of myocardial infarction, bypass surgery or angioplasty, 6) patients with heart failure, renal disease, pneumothorax, pleurisy. 7) raised serum Troponin I level. Data were collected in a predetermined approved case record form after taking written informed consent.

Estimation of enzyme : All patients had plasma samples taken on admission for troponin I assays using the Beckman Coulter Accu TnI assay; Beckman Coulter, High Wycombe, UK; inter-assay CV 4.7 and 7.3% at mean troponin of 1.64 and 33.5 mg/l respectively).

Statistical methods

Continuous variables were expressed as mean(s.d) unless indicated otherwise. Association/correlation between continuous variable were determined using Spearman correlation. Difference in normally distributed data between groups were analysed by means of independent t test. The χ^2 test was used for categorical variables. P values < 0.05 considered significant. Statistical analysis was performed using SPSS version 15.0(SPSS, Chicago, Illinois,USA)

Results

Results of age distribution are shown in Table I and figure 1. 68% of the patients were in the age range of 35 to 55 years, 30% above 55 years and 2% below 35 years.

Age and sex variation

Results are shown in Table II that the mean age among male was 50.0±8.39 years and among female was 55.89±12.16 years. The mean age difference among sex was significant (p<0.05).

Age range and sex variation

Results shown in Table III that within age range of <35, 35-55, >55 years, the percentage frequencies of male were 2%, 52%, 12% and in case of female were 0%, 16% 18% respectively.

Association of age and sex variation

Results shown in Table III that at df 2, at 5% level of confidence, tabulated value was 5.99. Calculated value was 6.13 which was higher than tabulated value. Hence the relationship of age range and sex variation was significant (p<0.05).

Data were analyzed by Chi- square test; Degree of freedom (df): 2; Calculated value: 6.13

Tabulated value: 5.99

Cardiac risk factors

Results shown in table V and fig-1 that among the unstable angina patients 44% were smokers, 36% were hypertensive, 34% were diabetic.

Cardiac risk factors and sex variation

The history of cardiac risk factors viz. smoking, hypertension and diabetes mellitus in relation to sex shown in Table VI. The association of cardiac risk factors in relation to sex was found to be significant. Fig. 2 shows the percentage frequency of cardiac risk factors in different sex.

Table I: Percentage frequency of age distribution of patients

n	<35 years		35-55 years		>55 years	
	n	%	n	%	n	%
50	1	2	34	68	15	30

n=number of patient

Table II: Mean age of the patients in relation to sex

	n	Mean age ± SD	Age range	P*
Total	50	52.12 ± 10.18		0.049¥
Male	32	50.00 ± 8.39	32-75 years	
Female	18	55.89 ± 12.16		

n= number, Values are mean (s.d) *Unpaired Students t-Test, ¥ <0.05 is significant

Table III: Percentage frequency of patients of both sexes in different age range.

Age range (Years)	Number of patients (50)		Percentage frequency	
	M	F	M	F
<35	1	0	2%	0%
35-55	26	8	52%	16%
>55	6	9	12%	18%

Table IV: Proportion of patients in different age range in relation to sex

Age range	Male	Female	Row Total
<35	0	01	01
35-55	26	08	34
>55	06	09	15
Column Total	32	18	50

Table V: Showing percentage frequencies of cardiac risk factors in unstable angina patients

Cardiac Risk factors	Present	Absent
1.Smoking	22(44%)	28(56%)
2.Hypertension	18(36%)	32(64%)
3. Diabetes mellitus	17(34%)	33(66%)

Table VI: Cardiac risk factors (CRF) in relation to sex

Cardiac risk factors		Subjects (n=50)				0.000***
		Male (n=32)		Female (n=18)		
		n	%	n	%	
Smoking	Yes	21	65.63	1	5.56	0.032*
	No	11	34.38	17	94.44	
Hypertension	Yes	8	25.00	10	55.56	0.015*
	No	24	75.00	8	44.44	
Diabetes mellitus	Yes	4	12.50	8	44.44	0.015*
	No	28	87.50	10	55.56	

Data were analyzed by Chi- square(X^2) test.;*** = significant at <0.001

* = significant at <0.05;n=number of patients.; es=present;No=absent

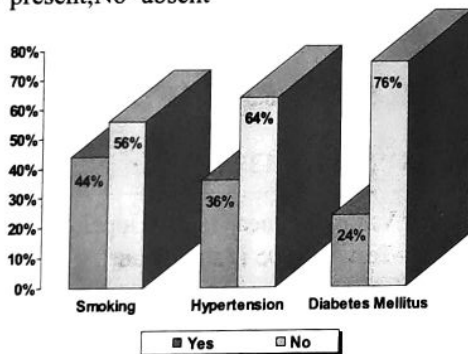


Fig 1 : Bar diagram showing percentage frequencies of cardiac risk factors in unstable angina patients. Here Yes= present, No= absent

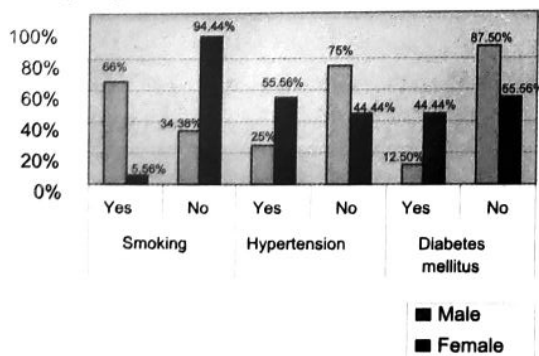


Fig 2 : Bar diagram showing the percentage frequency of cardiac risk factors in male and female. Here Yes=present, No=absent

Discussion

In this study the frequency of sexes was observed. The frequency of male was 64% which was nearly similar to a previous study 67%¹¹ and female was 36% which was inconsistent with the previous study 29%^{5,6}.

The result of the present study showed the percentage frequencies of patients in different age groups. The findings were 68% in the age range of 35-55 years, 30% above 55 years and 2% below 35 years. In a previous study it was found that 28.3% patients were <45 years, 71.7% patients were >45 years, 77.5% patients were <60 years and 22.5% patients were >60 years⁷. The percentage frequencies of male and female in different age range were observed and found that within the age range of <35yrs. 35-55 yrs. and >55 years, the percentage frequencies male were 2%, 52%, 12% and in case of female were 0%, 16%, 18% respectively. The association of different age range of patients and sex was observed and found that at df-2 and at 5% level of confidence, calculated value was 6.13 which was higher than tabulated value (5.99). Hence the relationship of age range and sex variation was significant (p<0.5).

The result of this study showed that the age variation in male and female among unstable angina patients was statistically significant (male vs. female, 50.00±8.39 years vs. 55.89±12.16 years, P=0.049) and elderly female were affected more than male. This result was consistent with the previous study which showed that women were on average slightly older than men in unstable angina patients^{8,9,10}. This might be that menopausal women in comparison to male are prone to be attacked with unstable angina which may be due to deficiency of estrogen at menopausal age and estrogen deficiency may cause atherosclerotic change of coronary arteries by increasing plasma LDL level¹¹.

The frequency of cardiac risk factors (smoking, hypertension and diabetes mellitus) was observed. The frequency of smoking was 44% which was nearly consistent with the previous study 42%.¹² The percentage frequency of hypertension was 36% which was nearly close to a previous study 42%^{5,12}. The percentage frequency of DM was 34% which was inconsistent with the previous study 17%^{5,12}. This might be due to health awareness of that population than ours. In another study of the Arabian people, it was found that it was 42.7%. This might be due to high fat diet, less health awareness and physical inactivity.

The relationship of cardiac risk factors viz. smoking, hypertension, diabetes mellitus with sexes was observed. The association between smoking and sexes was found to be significant ($p < 0.001$) and female smoker were fewer in number than male. This finding was inconsistent with the previous study conducted by Judith et al¹⁰. The association between hypertension and sexes was found to be significant ($p < 0.05$) and female were more hypertensive than male. Some investigators reported that hypertension was more prevalent in women in unstable angina.^{9,13,14} This might be due to atherosclerosis caused by estrogen deficiency in post menopausal women. The association between diabetes mellitus and sexes was found to be significant ($p < 0.05$) and female were more diabetic. This might be due to less physical activity and less health awareness and abdominal obesity³ may cause more frequently to insulin resistance in female.

Limitations of the study

Small sample size.

Conclusion

This study concludes that in UA substantial sex differences in age variation and in traditional cardiac risk factors specially hypertension, diabetes mellitus are more potent risk factors for women. Further research in identifying gender difference in coronary heart disease may help fine tune in prevention, diagnosis and treatment of UA in women.

Disclosure

All the authors declared no competing interestes

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