



Dyslipidemia Associated with Hypertension Increases the Risks for Coronary Heart Disease: A Case-Control Study in a tertiary level hospital in Bangladesh

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Abstract

Objective: In this study our main goal is to evaluate the effect of dyslipidemia Associated with Hypertension for Coronary Heart Disease.

Method: This case control type of study was conducted in Cardiology Department of National Institute of Cardiovascular Diseases (NICVD), during January 2018 until December 2019. Study subjects were selected from admitted patient with acute coronary syndrome at emergency department and at in-patient department of the Cardiology Department.

Results: During the study, in case group dyslipidemia and hypertension were present in 77% and 62.5% patients. Where as in control group it was 30% and 20%. In cas group mean \pm SD of systolic blood pressure was found 134.75 ± 19.25 and random blood sugar was found in 223.81 ± 72.18 mg/dl. In full model of dyslipidemia with CHD interaction between dyslipidemia and hypertension were found as confounder.

Conclusion: From our study, it is concluded that dyslipidemia and hypertension are established risk factors of prime importance in CHD development. Relationship of dyslipidemia with coronary heart disease in hypertension is significant. Additional research, in particular longitudinal studies, is needed to explore the complex interaction of these factors and to inform policies and programs for the inhibition and supervision of CHDs in Bangladesh.

Keywords: Coronary heart disease (CHD), dyslipidemia, hyperlipidemias.

Introduction

Dyslipidemia is the most common risk factor of CHD for the excessive level of lipids in blood. Most dyslipidemias are hyperlipidemias in developing countries; that is, an accumulation in blood lipids.

Sometimes because of diet and lifestyle. A longer rise in insulin concentrations can also contribute to dyslipidemia. The classification of dyslipidemia into primary and secondary forms. Primary dyslipidemia is normally inherited. Secondary dyslipidemia is acquired disease. It occurs because

of other factors, for example obesity or diabetes. Dyslipidemia is the first major risk factor for coronary artery disease, which is generally accepted (CHD).¹⁻⁴ CHD was 18 times more likely to grow according to hypertension with dyslipidemia category than with non-dyslipidemics.⁹

The world's leading cause of morbidity and mortality remains coronary heart disease (CHD), in particular myocardial infarction secondary to coronary artery atherosclerosis. The fibroproliferative condition of medium-sized and large arteries, primarily caused by cumulative lipid is a chronic multifocal immunomorphologic atherosclerosis. The major risk factors for CHD include elevated concentrations of Total lipoprotein cholesterol (TC and LDL-C) as well as low concentrations of triglycerides (TG) and high-density HDL-C lipoprotein cholesterol. LDL-C is called 'bad cholesterol' because an elevated risk of coronary heart attack and stroke is linked with too much cholesterol content.

Dyslipidemia may also be a condition for CHD, before other significant threats arise. The predominant lipid disorders in Asians have been higher than those of non-Asians in research.⁶

In this study our main goal is to evaluate the effect of dyslipidemia associated with hypertension for Coronary Heart Disease.

Objectives

- To assess the effect of dyslipidemia associated with Hypertension for Coronary Heart Disease.
- To identify risk factors for CHD in Bangladeshi patients with CHD.

Methodology

This case control type of study was conducted in Cardiology Department of National Institute of Cardiovascular Diseases (NICVD), during January 2018 until December 2019. Study subjects were selected from admitted patient with acute coronary syndrome at emergency department and at in-patient department of the

Cardiology Department. Sampling technique was purposive. During the study period this case-control study used is use secondary data from medical record data from the NICVD. To reduce the risk of selection bias in this study is use of simple randomization. The dependent variable was incidence of coronary heart disease (CHD), and the main independent variable was dyslipidemia status. The potential confounding variables age, gender, family history of CHD, smoking habit, hypertension or history of hypertension, diabetes or history of diabetes, and obesity.

Inclusion Criteria

The sample of case group was patients diagnosed with CHD by the doctor, randomly selected a total of 82 respondents, while the control group considered with patients diagnosed with Atrial Fibrillation and Flutter (AFF) by a physician, randomly selected 81 respondents.

Exclusion Criteria

Patients with no symptom of CHD and dyslipidemia excluded from this study.

Data Analysis

The data were analysed using a binomial regression statistic test where an interaction assessment and confounding test were conducted. The interaction between dyslipidemia status variable and potential confounding variables was assessed using the forward method, in which the interaction variables were entered one by one into logistic regression model. Variables were considered to interact if they had a p value <0.05. The assessment of confounders was done by removing candidate confounding variables one by one, starting from the variable with the highest Wald p value. If the variable after being issued from the model caused an odds ratio (OR) of dyslipidemia status variable change greater than 10%, the variable was considered a confounder and remained in the model.

Results

Table-1 show risk factor analysis of the patients where in case group dyslipidemia and

hypertension were present in 77% and 62.5% patients. Where as in control group it was 30% and 20%. The following table is given below in details:

Table-1: Distribution of risk factors for CHD in patients

Variable	Case (n = 82)	Control (n = 81)
	%	%
Smoking	51%	21%
Hypertension	62.5%	30%
Dyslipidaemia	77%	20%
Obesity	22%	10%
DM	33%	30%
Family history of CHD	25%	23%
Sedentary life style	21%	15%

Note: Patients with multiple risk factors

In table-2 shows distribution of patients according to clinical findings where in case group mean ±

SD of systolic blood pressure was found 134.75 ± 19.25 and random blood sugar was found in 223.81 ± 72.18 mg/dl. The following table is given below in details.

Table-2: Distribution of patients according to clinical findings

Clinical Examination	n = 82	n = 81
	Mean ± SD / n (%)	Mean ± SD / n (%)
Heart Rate (per minute)	87 ± 15	89 ± 17
Respiratory rate (bpm)	21 ± 7	19 ± 5
Systolic BP (mmHg)	134.75 ± 19.25	191 ± 19.25
Diastolic BP (mmHg)	87 ± 11.52	80 ± 11.52
BMI (Kg/m ²)	23.76 ± 2.51	22.86 ± 2.51

In table-3 shows full model of dyslipidemia with CHD. Where is interaction between dyslipidemia and hypertension were found as confounder.

Table-3: Full model of dyslipidemia with CHD

Risk factor	Avg. Number of Patients (N) %	P value	OR
Dyslipidemia	36	0.050	2.7
Hypertension	46.25	0.195	0.5
Having family history of CHD	24	0.295	1.7
Smoker	36	0.926	1.0
Diabetes	31.5	0.824	1.1
Obese	16	0.512	0.8
Dyslipidaemia + hypertension	47.37	0.038	6.5

Note: Patients with multiple risk factors average both case and control group

Table-5: One-Sample Statistics

Variables	N	Mean	Std. Deviation	Std. Error Mean
CHD with dyslipidemia in Hypertension group	77	1.3117	.46622	.05313

Table-6: Relationship of dyslipidemia with coronary heart disease in hypertension

Variables	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
CHD with dyslipidemia in Hypertension group	24.688	76	.000	1.31169	1.2059	1.4175

Discussion

The Ariyanti R and Besral B analysis found that the CHD group was at 50 percent of people reacting with dyslipidemia, while the non-CHD group was at 17.3 percent. Depending on hypertensive condition, the association between

dyslipidemia and CHD varied. Once controlled forage, in hypertensive respondents or having a history of hypertension, respondents with dyslipidemia are 18 times higher to develop CHD than nondyslipidemic respondents. Although respondents with dyslipidemia are 2,5 times

higher to experience HCDs than non-dyslipidemics for respondents who are not hypertensive or have a history of hypertension.

About the evaluation of risk factors of CAD, dyslipidemia was present in 77% hypertension was found in 62.5%, smoker was 53%, DM was found in 33%. The results of current study with reference to risk factors were similar to previous published papers.⁸ In one article reported that, 75.6% did not have family history of CHD, did not have smoking habit (53.7%), did not have hypertension or hypertension history (62.2%), having diabetes or history of diabetes (53.7%, and nonobese (62.2%).

Other study said, the mean of SBP in CHD group was higher than non-CHD group, which was 126.2 mmhg with standard deviation of 21.0, where the lowest SBP was 100 mmhg and the highest was 200 mmhg. The average of DBP in CHD group was higher than non-CHD group, which was 85.6 mmhg with standard deviation of 15.5, where the lowest DBP was 60 mmhg and the highest was 120 mmhg.¹⁰ Where as in our study in case group mean \pm SD of systolic blood pressure was found 134.75 ± 19.25 and random blood sugar was found in 223.81 ± 72.18 mg/dl.

The risk of CHD in patients with dyslipidemia will increase if dyslipidemia is accompanied by one or more other CHD risk factors.

Various studies showed that other factors that can cause cardiovascular disease as hypertension. In our study we found that, the relationship of dyslipidemia with CHD according to hypertension, those with dyslipidemia were more likely to develop CHD compared to those nondyslipidemic. The weakness design of the study is susceptible to selection bias.

Conclusion

From our study, it is concluded that dyslipidemia and hypertension are established risk factors of prime importance in CHD development. Relationship of dyslipidemia with coronary heart disease in hypertension is significant. Additional research, in particular longitudinal studies, is

needed to explore the complex interaction of these factors and to inform policies and programs for the inhibition and supervision of CHDs in Bangladesh.

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