THE ROLE OF HYPERGLYCEMIA IN DIABETES AND ATHEROSCLEROSIS

Physiology

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ABSTRACT

Atherosclerosis is a major cause for cardiovascular disorders in diabetes and metabolic syndrome. Many risk factors are associated with the metabolic syndrome.(1). The metabolic syndrome occurs in most people with type 2 diabetes, its presence likely accounts for most of the increased incidence of CVD in type 2 diabetes (2). However the presence of diabetes increases the risk of CVD beyond this it is with the metabolic syndrome alone. Moreover CVD risk is increased in type 1 diabetes (3) in which the presence of metabolic syndrome and other risk factors is less common. There is evidence that glucose plays an important role in atherogenesis and also discusses the relative importance of glucose versus lipids. The epidemiological evidence suggests that hyperglycaemia and glycaemic control are CVD risk factors.

Many events are involved in the increase of cardiovascular disease (CVD) (1). Most of the people with type 2 diabetes, increases incidence of CVD (2). Beside this CVD risk factor is also seen in type 1 diabetes (3), but it is less common. The type 1 and type 2 diabetes are increased risk factor of atherosclerosis and CVD. Hyperglycaemia which defines the diabetic state and which is common to type 1 and type 2 diabetes.

AIMS AND OBJECTIVE

The study was undertaken to find out the role of Hyperglycaemia in diabetes and atherosclerosis and possible risk factors associated with metabolic syndrome.

KEYWORDS:

Hyperglycaemia, Diabetes, Atherosclerosis, Cardiovascular disease, HBA1c

INTRODUCTION

The epidemiological evidence supports an association between glycaemic control and CVD risk (4). The relationship between glycaemic control and CVD in patients with type 2 diabetes, indicating a linear relationship between HbA1c and CVD endpoints, particularly myocardial infarction (5). However, the slope of the relationship between HBA1c and micro vascular complication is much steeper than that for myocardial infarction, raising the question of whether glucose play a greater role in the pathogenesis of micro vascular than cardiovascular complications of diabetes. Similar but less-robust relationships have been observed in patients with type-1 diabetes. (6). Atherosclerosis is initiated by the adhesion of monocytes to arterial endothelial cells, followed by their transmigration in to the sub-endothelial space along a chemotactic gradient in which high glucose condition may enhance. (7) (8). The monocytes grown in high glucose conditions show evidence of increased expression of the cytokines, interleukin-1 and interleukin -6 (9). Therefore other approaches are necessary to understand the potential role of hyperglycaemia in the pathogenesis of card iovascular disease.

STUDY SETTING – Hind Institute of Medical Sciences, Mau, Ataria, Sitapur, Lucknow.

STUDY PERIOD – September 2016 to February 2017

MATERIAL AND METHODS

A total number of 200 cases of type 1 and type 2 diabetes mellitus are enrolled in this study. The cases were taken at Hind Institute of Medical sciences and Hospital, Mau, Ataria, Sitapur, Lucknow, which is a teaching hospital. The diabetic cases were taken from O.P.D of general medicine along with their cases of normal 100 health controls were also carried out for the study.

The physiological examination were carried out at Hind Institute of medical sciences and the biochemical examination were carried out in the biochemistry laboratory , department of biochemistry, at Hind Institute of medical sciences (H.I.M.S.) The biochemical parameters were done on fully automated clinical chemistry analyser COBAS C - 23.

Table -1 Age and sex distribution of diabetes type-1 and type 2.

S.NO	Age	Sex	SD Mean	P value
1	30-50	Female	± 10	< 0.01
2	30-60	Male	± 15	< 0.01

P = < 0.01

Table- 1 shows age and sex distribution in type- 1 and type -2 diabetes mellitus.

Table-2 Biochemical parameters of diabetes type-1 and type -2 in hyperglycaemia.

S. No.	Parameters	Type -1 diabetes	Type-2 diabetes	Control
1	FBS	>110	> 140	90
2	PPBS	>230	>285	130
3	HBA1c	>10.0	>12.0	7.0
4	Cholesterol	212	285	145
5	Triglycerides	245	288	122
6	H.D.L	48	52	38
7	L.D.L	124	148	78

Table- 2 shows different parameters of lipid profile in type-1 and type -2 diabetes mellitus.

CONCLUSION

Epidemiological studies have provided convincing evidence that the risk of CVD is increased by the presence of diabetes and that the increased risk is related to the extent of glycaemic control. This study provides important information regarding the role of specific risk factors, such as hyperglycaemia and glycaemic control, in CVD in diabetes. There is evidence gained from all these lines provided a better understanding the role of diabetes in the pathogenesis of CVD and its complications.

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