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RESEARCH ARTICLE

ASSOCIATION OF DYSLIPIDEMIA WITH ELEVATED GLYCOSYLATED HAEMOGLOBIN

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ABSTRACT

Introduction: HbA1c has long been known for its role in evaluating glycemic control and elevated levels are used as an indicator for increased risk of diabetic complications. Further Type 2 diabetic patients often show evidence of dyslipidemia. Aim: This study was undertaken to identify the role of HbA1c as an indicator of dyslipidemia in Type 2 diabetic patients. Method: A retrospective analysis of blood reports of about 100 type 2 diabetes patients was undertaken. Their HbA1c levels and lipid profile values were recorded and analysed. Results: The chi square test showed significant association between raised HbA1c and raised cholesterol and triglycerides levels ($P<0.05$). Conclusion: This study supports the view that raised HbA1c levels in diabetic patients should be an alerting factor for screening the lipid profile in these patients.

INTRODUCTION

Type 2 Diabetes mellitus is a common metabolic disorder due to insulin resistance. It results in hyperglycemia which causes increase in levels of glycated hemoglobin. In 2011, WHO changed its stand on HbA1c and it was concluded that a value of HbA1c above 6.5% can be used as a diagnostic criteria for diagnosing diabetes. Dyslipidemia is often associated with type 2 diabetes and is an important component of the metabolic syndrome. It is defined as the presence of one or more abnormalities in serum lipids that includes hypercholesterolemia (total cholesterol level ≥ 200 mg/dl), hypertriglyceridemia (TGL≥ 150 mg/dl), low HDL (HDL< 40 mg/dl), high LDL (LDL ≥ 100 mg/dl). In type II-diabetics the decisive pathogenetic factor for hypertriglyceridemia is increased VLDL-triglyceride-synthesis in the liver especially due to augmented free-fatty-acid flux. Additionally the activity of the lipoprotein lipase can be reduced[1]. This impaired lipid metabolism resulting from uncontrolled hyperglycaemia in diabetic patients has been implicated in cardiovascular complications in these patients. Estimated risk of CVD has shown to be increased by 18% for each 1% increase in absolute HbA1c value in diabetic population [2].

This study was undertaken to identify the role of HbA1c as an indicator of dyslipidemia in Type 2 diabetic patients.

SUBJECTS AND METHODS

A retrospective analysis of blood reports of about 100 type 2 diabetes patients was undertaken. Their HbA1c levels and lipid profile values were recorded. Patients were divided into three groups based on their HbA1c values as good glycemic control <7g/dl, poor glycemic control 7 to 8.5 g/dl and very poor glycemic control. Their lipid profiles were compared and analysed.

RESULTS

All patients with good glycemic control had normal cholesterol values (<200mg/dl) while 38% of patients with poor glycemic control and 34% of patients with very poor glycemic control had raised cholesterol levels. About 16% of patients with good glycemic control had raised triglycerides (> 100mg/dl) while 51% and 55% of patients with poor and very poor glycemic control had raised triglycerides respectively. The chi square test showed significant association between raised HbA1c and raised cholesterol and triglycerides levels ($P<0.05$). By calculating Pearsons correlation coefficient, we established a positive linear correlation of HbA1c levels with total cholesterol and triglyceride but the correlation was weak.

DISCUSSION

Patient with DM have a two to six fold increased risk of CHD, peripheral vascular disease and cerebrovascular disease than those without it. The Cholesterol and Recurrent Events study has shown that effective control with lipid lowering therapy in type 2 DM makes a strong impact on the serum lipid level and cardiac events. Reduction of HbA1c by adequate control of glycemic status will reflect in the lipid levels thereby lowering the cardiovascular risk in these patients. Checking the lipid

profile of the patients on routine basis may not be possible in developing countries like India. So there is a need to identify a factor that will alert us to do so. In that regard HbA1c which is already a part of diabetic work up, has promising scope.

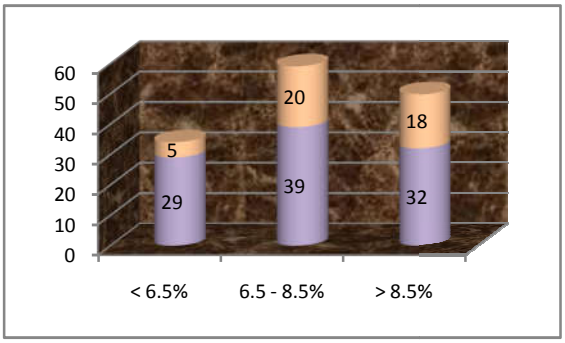

Figure 1 Association between HbA1c levels and hypercholesterolemia

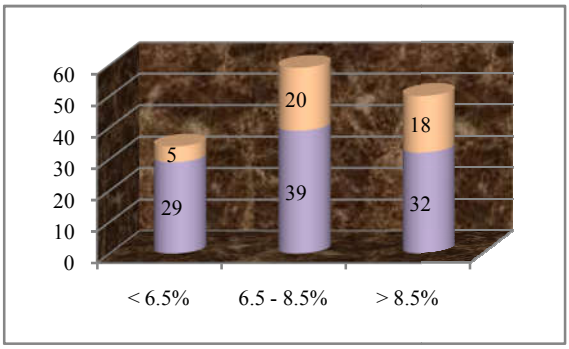

Figure 2 Association between HbA1c levels and hypertriglyceridemia

CONCLUSION

This study supports the view that raised HbA1c levels in diabetic patients should be an alerting factor for screening the lipid profile in these patients. By using HbA1c as an indicator of dyslipidemia we can identify patients earlier and treat dyslipidemia thereby reducing the risk of cardiovascular complications.

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