

Narrative Review: Lipoprotein (a) in Type 2 Diabetes Mellitus: Relation to LDL:HDL Ratio and Glycemic Control

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ABSTRACT

Lipoprotein- A is a key lipid particle, which are having a key role in cardiovascular diseases and other metabolic disorders. Altered lipid level is mainly seen in patients with Type 2 Diabetes Mellitus with deranged lipid ratios like the low-density lipoprotein to high-density lipoprotein ratio. This narrative review mainly focus on the association of Lipoprotein- A, low-density lipoprotein: high-density lipoprotein ratio and glycemic control in Type 2 Diabetes Mellitus Patients. This narrative review focus on the pathophysiologic role of Lipoprotein- A with respect to Type 2 Diabetes Mellitus and cardiovascular diseases, the clinical relevance of increased Lipoprotein- A concentrations in diabetic patients, and treating dyslipidemia in this population. We will appraise the role of Lipoprotein- A in Type 2 Diabetes Mellitus, potential pathophysiological mechanisms, and treatment options for influencing Lipoprotein- A in Type 2 Diabetes Mellitus patients. In order to understand the better relationship between Lipoprotein- A, lipid ratios (LDL: HDL), and glycemic control in individuals with type 2 diabetes, the study recommends for additional research.

Keywords: Lipoprotein- A, Type 2 Diabetes Mellitus, altered low-density lipoprotein to high-density lipoprotein ratio, Blood Sugar control, cardiovascular disease, Dyslipidemia

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INTRODUCTION

Type 2 Diabetes Mellitus is a chronic metabolic disorder, characterized by insulin resistance and dyslipidemia with deranged lipid profile. Patients with Type 2 Diabetes Mellitus are commonly seen associated with conditions like dyslipidemia with high low-density lipoprotein cholesterol and low high-density lipoprotein cholesterol. There is a evidence associated with a new lipoprotein particle named Lipoprotein- A related to cardiovascular disease and other issues associated with diabetes mellitus.[1]. In patients with diabetes, elevated Lip (a) levels warrant aggressive control of conventional cardiovascular risk factors, such as HDL-C, LDL-C, and blood pressure [2]. Along with the glycoprotein apolipoprotein (a), Low density lipoprotein-like particle forms the lipoprotein complex known as Lipoprotein- A. Lipoprotein- A is recently found out to be an independent potential risk factor for atherosclerotic cardiovascular disease inspite of traditional lipids, including Low Density Lipoprotein-Cholesterol and High Density Lipoprotein-Cholesterol. Moreover, higher Lipoprotein- A levels have been reported with Type 2 Diabetes Mellitus when compared to non-Diabetes Mellitus patients.[3] However, the association of Lipoprotein- A with Low Density Lipoprotein: High Density Lipoprotein ratio and glycemic control in Type 2 Diabetes Mellitus are poorly defined, and this initiates the interest of research. This review is to analyse the associations of Lipoprotein- A and Low Density Lipoprotein: High Density Lipoprotein ratio with glycemic control in Type 2

Diabetes Mellitus patients and it's association with development of cardiovascular complications.[4]

Method

Here, we conducted a narrative review to find and summarize research studies about the associations of Lipoprotein- A with Type 2 Diabetes Mellitus.

Data collection: English literature review of original research articles, systematic reviews, and clinical trials via PubMed, Scopus, and Google Scholar search engine. Studies were considered eligible if the (primary or secondary) aim was to:

1. The relation between lipoprotein- a and type 2 diabetes mellitus.
 2. The relation between lipoprotein- a and the lipid ratio (low density lipoprotein: high density lipoprotein ratio)
 3. The relation of blood sugar level and lipoprotein- levels
- Exclusion criteria: populations without Type 2 Diabetes Mellitus, as well as those that did not address Lipoprotein- A or the Low-Density Lipoprotein: High Density Lipoprotein ratio in relation to diabetes. Additionally, articles and case reports lacking clinical data were excluded.

Challenges and Ethical Considerations

There are several challenges regarding investigations on Lipoprotein- A and Type 2 Diabetes Mellitus relations. A major Difficulty is that genetic risk for high Lipoprotein- A levels is

heterogeneous and association between Lipoprotein- A and cardiovascular diseases has been difficult to render in people with Type 2 Diabetes Mellitus.[5] These associations are also confused, notably in kidney illness, obesity, and hypertension.[6]. Pharmacological agents reducing Lipoprotein- A, Nutritional and exercise therapy influence the modest effects in patients with Type 2 Diabetes Mellitus. It is important to get informed consent when conducting studies involving individuals with Type 2 Diabetes Mellitus, particularly as many participants may have other comorbidities that require careful consideration. Additionally, given the emerging nature of research on Lipoprotein- A, ethical concerns about potential interventions and their long-term effects on patients must be carefully addressed.

CONCLUSION

The correlation between Lipoprotein- A, the Low Density Lipoprotein: High Density Lipoprotein ratio, and glycemic control in Type 2 Diabetes Mellitus is a complicated and the interesting area of research. In individuals with Type 2 Diabetes Mellitus, very high Lipoprotein- A levels associate with increased cardiovascular events, henceforth Type 2 Diabetes Mellitus, dyslipidemia correction is a multifactorial issue in clinical practice. More studies have to come up to clarify the relationship of Lipoprotein- A, lipid ratios [Low Density Lipoprotein: High Density Lipoprotein ratio] with glycemic control and their association with the development of cardiovascular risk in the above noted patients helping in accurate treatment strategies aimed at cardiovascular risk modification. Upcoming studies have to come up to describe the both precise mechanisms by which Lipoprotein- A lead to dyslipidemia in patients with Type 2 Diabetes Mellitus and the influence of glycemic control on Lipoprotein- A levels and whether elevated Lipoprotein- A is a apparently pharmaceutical target for therapy.

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