



RESEARCH ARTICLE

ZOOLOGY

**A PRELIMINARY STUDY OF LIPID PROFILES IN PEDIATRIC POPULATION AND YOUTH POPULATION WITH TYPE I DIABETES.**

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**ABSTRACT**

The term *diabetes* usually refers to diabetes mellitus, which roughly translates to excessive sweet urine. Diabetes mellitus (DM) is a chronic disease which leads to biochemical and anatomical/structural consequences. It is a disease of carbohydrate, fat, and protein metabolism caused by the lack of insulin, which results from the marked and progressive failure of the pancreas to secrete insulin because of autoimmune destruction of the beta cells. The purpose of this study is to identify the role of glycemic control on the altered lipid profile in pediatric population and youth population with Type I diabetes of poverty line attending to Government Stanly Hospital, Chennai

## KEY WORDS

Type I diabetes, pediatric population, cholesterol, lipid profiles.

## INTRODUCTION

Diabetes mellitus often simply referred to as diabetes is a group of metabolic diseases in which a person has high blood sugar, either because the body does not produce enough insulin or because cells do not respond to the insulin that is produced. Children and young adults are constantly affected with type 1 diabetes also known as juvenile diabetes or insulin-dependent diabetes in which the body fails to produce insulin. The subsequent lack of insulin leads to increased blood and urine glucose. This high blood sugar produces the classical symptoms of polyurea (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger). Youth with diabetes appears to be more affected with dyslipidemia than in the general pediatric population (Maahs DM. *et al*,2005 : Schwab KO. *et al*,2006) and its relationship with glycemic control has been repeatedly documented(Maahs DM. *et al*,2005 : Maahs DM. *et al*,2007 : Polak M. *et al*,2000).Young adults with type 1 diabetes and elevated lipid level shows a prominent risk of cardio vascular disease (Weis U *et al.*, 1994) and higher risk for atherosclerotic disease compared with that of the general population (Krolewski AS *et al.*,1987).

The rapport between dyslipidemia and cardiovascular disease risk is well documented in young adult diabetic populations, and treatment with lipid-lowering drugs has been associated with reduced cardiovascular events (Durrington PN. 1999). The potential role of dyslipidemia in the development of microalbuminuria and diabetic nephropathy have been highlighted by Clinical and experimental studies which also states that mesangial, tubulo-interstitial, and glomerular

changes in the kidney have been associated with lipid levels (Bonnet F , Cooper ME .2000).

The search for type 1 Diabetes in Youth aged 10–22 years had lipid levels outside the recommended targets (*Kershnar AK, et al., 2006*). The goals of this study is to compare the lipid profile, as measured by total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides, in pediatric population and youth population with Type I diabetes of poverty line attending to Government Stanly Hospital.

## MATERIALS AND METHODS

Estimation of glucose by GOD and POD method

Estimation of cholesterol and other lipid profiles GOD and POD method (VLDL, HDL, LDLAND TG)

Calculating BMI, WAIST AND HIP RATIO

Diagnosing BP

Calculating WAIST CIRCUMFERENCE

Conducting a survey method to identify the Socio-Economic status

## STATISTICAL ANALYSIS

Statistical analyses were performed using SPSS for Windows (version 11.5); Descriptive statistics on each study variables including means and standard deviations were analyzed. Datas obtained on lipid profiles of pediatric population of male , female and Type I diabetes in among youth population are subjected to analysis of variance (ANOVA).

## RESULTS

The observations of type 1 diabetes with short duration was made in two criteria i.e. in

pediatric population of male , female and youth population of below poverty line based on self-reported income level.

Table1: Pediatric population of both male and female have lower BMI. Waist circumference, blood pressure levels, with Type I diabetes shows no threatening of dyslipidemia .There is no elevation on their cholesterol level and triglyceride level .The range of cholesterol and triglyceride falls in the normal limit and the probability value remain  $>.05$  i.e. (  $p > 0.5$  ) in all cases

Table2: The observation of youth population with Type I diabetes shows a peak change in the cholesterol and triglyceride level when compared to the pediatric population. Dyslipidemia is more common among youth with Type I diabetes. Lipid profile values were significantly higher than those in Pediatric subjects for total cholesterol, LDL cholesterol, non-HDL cholesterol and the probability value remain  $>.05$  i.e. (  $p > 0.5$  ) in all cases.

**TABLE 1**

CRITERIA	FEMALE N = 20	MALE (N=10)
AGE	12.7 ± 0.5	16.5 ± 3.5
BMI	21.1 ± 3.9	18.0 ± 1.1
WAIST CIRCUMFERENCE , cm	61.6 ± 5.6	69.8 ± 5.4
WAIST :HIP RATIO	0.81 ± .02	0.86 ± 0.01
SYSTOLIC BP ,mm.Hg	119.25 ± 6.3	120 ± 14.1
DIASTOLIC BP ,mm.Hg	75 ± 5.7	85 ± 7.0
GLUCOSE, mg/dl	192.5 ± 69.5	224.5 ± 55.8
TOTAL CHOLESTEROL, mg/dl	138.2 ± 37.1	179.3 ± 52.3
TRIGLYCERIDES, mg/dl	149.2 ± 62.7	120 ± 4.2
LDL CHOLESTEROL, mg/dl	180.0 ± 62.7	156.5 ± 61.5
HDL CHOLESTEROL, mg/dl	30.0 ± 7	36.9 ± 4.9

**TABLE 2**

CRITERIA	N=10
AGE	24 ± 2.8
BMI	23.2 ± 2.4
WAIST CIRCUMFERENCE , cm	81.2 ± 3.6
WAIST :HIP RATIO	.87 ± .02
SYSTOLIC BP ,mm.Hg	128 ± 2.8
DIASTOLIC BP ,mm.Hg	95 ± 7.0
GLUCOSE, mg/dl	170 ± 14.1
TOTAL CHOLESTEROL, mg/dl	179.3 ± 52.3
TRIGLYCERIDES, mg/dl	173 ± 14.1
LDL CHOLESTEROL, mg/dl	203 ± 41.7
HDL CHOLESTEROL, mg/dl	38.5 ± 2.1

## DISCUSSION

Data on lipid and lipoprotein factors in pediatric population and youth with type 1 diabetes are very little. Type 1 diabetes in youth with poorly controlled glycemic level shows comparatively excess of LDL and more triglyceride particles with those of normal subjects (James and Pometta 1990). (John Guy *et al.*, 2008) reported that glycemic control seems to be an important mediator for abnormal lipid levels and atherogenic changes in lipoprotein composition of youth with type 1 diabetes, even after a relatively short disease duration. Increasing A1C in youth with type 1 diabetes, shows increased level of total and LDL cholesterol, triglyceride, and non-HDL cholesterol levels (Petitti DB, Imperatore G *et al.*, 2007) and also dense LDL and apoB concentrations (Albers JJ, Marcovina SM *et al.*, 2008) increased with increasing A1C.

My study presents information on the characteristics of dyslipidemia in pediatric population and youth with type 1 diabetes with abnormal lipid levels, even after relatively short disease duration. Glycemic control seems to be an important mediator for dyslipidemia abnormalities. Advance research is desired to fully know the mechanisms by which type 1 diabetes contributes to altered lipid profiles and increased cardiovascular risk.

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