

Prevalence of Hyperlipidemia in Diabetic Infertile Women

ABSTRACT

The study was carried out to assess the lipid profile levels in diabetic infertile women as diabetes is often associated with infertility. 90 patients in the age limit 20- 40 years. One half diabetic and the other half non-diabetic presenting with a complaint of infertility were evaluated at the G. Kuppusamy Naidu Memorial Hospital, Coimbatore, Tamil Nadu, India. There was a significant increase in the triglycerides and VLDL (Very Low Density Lipid) cholesterol levels in diabetic infertile women when compared to non diabetic infertile women and hence this shows that assessment of Lipo protein levels is of much diagnostic importance and also one among the main criteria for establishing female infertility and diabetes is one of the main contributing factor which may cause fatal disorders like Cardio vascular diseases and Coronary artery diseases due to the vicious cycle caused by the combined vascular abnormalities associated with diabetes.

.Key words: infertility, triglycerides.

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INTRODUCTION:

Female infertility is the inability of the women to conceive after one year of unprotected and well-timed intercourse. It is a disease of the reproductive system that impairs one of the body's most basic function - the conception of children.¹ Infertility is just not a "woman's problem", but a medical problem of the male or female reproductive system.¹¹ Roughly one third of the infertility cases can be attributed to females. And the most common cause of female infertility is ovulation disorder mainly hormonal imbalance, blocked fallopian tube, polycystic ovarian syndrome and endometriosis.¹⁰

Certain diseases like Diabetes, Kidney disease or high blood pressure may also cause infertility. An infertile women especially PCOS (polycystic ovarian syndrome) displays many signs of Metabolic Syndrome (a disorder that substantially increases the chances of developing Cardiovascular Disease).^{6,7} These may include high blood pressure, Type 2 Diabetes and excessive abdominal fat, all high risk factors for developing Coronary heart disease and stroke and hence these conditions are inherent with increased cholesterol, triglyceride, LDL (bad cholesterol) which slowly builds up the inner walls of the arteries that feed the heart and brain. Together with other and low HDL (good cholesterol which protects the hearts) are the underlying symptoms that trigger the diagnosis of infertility. Infertility is often associated with mild diabetes.² Age is also a single, most important factor affecting a woman's fertility. As she matures, the chance for pregnancy decreases and the odds for miscarriage increase. Hence the aim of the study was to evaluate the

prevalence of increased lipids in diabetic infertile women.

MATERIALS AND METHODS:

Selection of Patients:

Ninety married women presenting with a complaint of infertility under the age group 20 40 years. Were selected for the study and their blood samples were collected. Forty five women with diabetes and the rest non- diabetic were considered and the lipid profile levels i.e., Cholesterol, Triglycerides, HDL (high density lipoprotein), LDL (low density lipoprotein) and VLDL (very low density lipoprotein) were carried out for each one of them. This study was carried out at G. Kuppusamy Naidu Memorial Hospital, Coimbatore, Tamil Nadu, India. The study was approved by the Institutional review board of the Hospital and a written consent was obtained.

Blood Sampling:

Fresh venous blood was collected between 9 and 11 am, which was allowed to retract naturally before serum was separated. Serum was frozen till assayed.

Assay of Cholesterol

Cholesterol level was estimated by CHOD-PAP method.

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Reagents:**Reagent 1:**

Pipes buffer pH6.70, Sodium cholate, 4-aminoantipyrine, Cholesterol esterase, Cholesterol oxidase, Peroxide.

Reagent2: Cholesterol standard 200mg/dl.

One ml of reagent 1 was added to three test tubes labeled blank (B), standard (S) and test (T) respectively. 10 ul of serum and 10 ul of standard was added to the respective tubes and mixed well. Then the tubes were incubated for 10 min. at 37degree C. The pink color developed was then read at 546 nm^{8,9}

The results are expressed in mg/dl.

Assay of Triglyceride

Triglyceride level was estimated by GPO-POD method

Reagents:**Reagent1:**

Glycerol kinase, Glycerol-3-oxidase (GPO), 4-aminophenazone, Lipoprotein lipase, p-Chlorophenol, GOOD buffer pH7.5.

Reagent2:

Standard 200mg/dl.

One ml of reagent 1 was added to three test tubes labeled blank (B), standard (S) and test (T) respectively. 10 ul of serum and 10 ul of standard was added to the respective tubes and mixed well. Then the tubes were incubated for 10 min. at 37 degree C. The pink color developed was then read at 546 nm.^{8,9}

The results are expressed in mg/dl.

Assay of HDL (high density lipoprotein) Cholesterol**Reagents****Reagent1:**

Magnesium phosphotungstic acid precipitating reagent.

Reagent 2: HDL standard 50mg/dl.

500 ul of Reagent 1 was added to test tubes labeled test (T) and blank (B). 500ul of serum and 500ul of standard was then added to the respective tubes. It was then mixed well and allowed to stand for 5 min. at room temperature. The tubes were then centrifuged at 3000rpm for 5min to get a clear supernatant. The supernatant was then used for analysis of cholesterol^{8,9}

The results are expressed in mg/dl.

VLDL (Very low density lipoprotein) determination:

VLDL= Triglycerides/5 mg/dl

LDL (Low density lipoprotein) determination:

LDL=Total cholesterol-(HDL+VLDL) mg/dl

RESULTS AND DISCUSSION:

Among the 90 patients analyzed 45 non diabetic and 45 diabetic infertile women were compared, triglycerides and VLDL were found to be significantly increased. However cholesterol, HDL cholesterol and LDL cholesterol showed significant increase in both diabetic and non diabetic infertile women rather than on comparison.

Table1:

LIPID PROFILE (Parameters)	Infertile non diabetic group	Infertile diabetic group	't' value
Cholesterol	203.13 ± 44.16	213.23 ± 39.08	1.124 ^{ns}
TGL	167.10 ± 44.64	200.19 ± 44.60	3.439**
HDL	41.78 ± 8.74	44.95 ± 9.78	1.588 ^{ns}
LDL	128.56 ± 42.25	128.26 ± 42.28	0.038 ^{ns}
VLDL	32.77 ± 8.68	39.54 ± 8.50	3.653**

Values are expressed by mean ± SD, n = 45

** - t<0.01(Significant at 1%), ns – not significant

Discussion:

The results of our study showed that the elevation of lipids especially cholesterol, triglyceride, LDL cholesterol, VLDL cholesterol and decrease in HDL cholesterol is a very significant factor in causing infertility in both diabetic and non diabetic women.

However these results are consistent with the earlier findings³, that dyslipidemia is associated with insulin resistance in women with polycystic ovaries.

The simultaneous study between infertile non diabetic and diabetic women showed not much significant change in cholesterol, HDL cholesterol and LDL cholesterol. However, in the present study, it has been observed that there was an extraordinary increase in the levels of triglycerides and VLDL in diabetic infertile women, which might be the cause of Coronary artery diseases. This argument is in agreement with an earlier study^{2, 4} that overweight women increase the risk of blood pressure and diabetes and raises the triglyceride level.

Upon the basis of the findings generated from the study, it can be safely concluded that elevated triglyceride and VLDL cholesterol level are indeed significantly responsible for infertility in women with diabetes in which the diabetic status is one of the main criteria contributing to infertility and cardio vascular diseases as they were observed in more than one half of the studied cases and this study goes with the findings⁵ that women with infertility especially PCOS (Poly Cystic Ovarian Syndrome) exhibits an abnormal lipoprotein profile characterized by raised concentration of serum triglycerides.

CONCLUSION:

Infertility is a common disorder and nearly one out of every six to eight couples suffers from it. The major thrust of diagnostic tests for women encompass the pituitary hormones and female steroidal hormones while lipid profile levels is

often sidelined. However, in this context, it is unveiled that increased levels of triglycerides and VLDL cholesterol highly contribute to female infertility in diabetic women which in turn might lead to various fatal diseases if left untreated.

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