International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Evaluating Serum Lipid Profiles in Postpartum Pituitary Necrosis Sheehan Syndrome Patients: A Comparative Study

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Abstract: ***Background: Sheehan's syndrome (SS) refers to the occurrence of varying degrees of hypopituitarism after parturition. Hypopituitary adults with growth hormone deficiency have abnormal body composition with increased fat mass. The present study was undertaken to evaluate the anthropometric, and lipids in SS patients. Material and Method: sixty - three SS patients and forty - four age and BMI - matched controls took part in this study. All patients were stable on conventional replacement therapy for at least one year before the study. The subjects underwent detailed clinical, biochemical and hormone analysis. Results: The SS patients showed significantly higher mean triglyceride, total cholesterol and LDL cholesterol and lower HDL cholesterol concentrations on conventional replacement therapy. This difference was statistically significant with a p value of <0.005. The difference was more marked in obese cases versus obese controls (p= 0.007) than in lean cases and controls. Conclusion: We found significant differences in triglycerides, total cholesterol, LDL, and HDL cholesterol levels. These findings highlight the distinct lipid abnormalities in SS patients, emphasizing the need for targeted management strategies in this patient population.***

Keywords: Sheehans Syndrome, Lipid Profile, Hypopituitarism, Postpartum Necrosis, Serum Lipids.

1. Introduction

Sheehan's syndrome (SS) occurs because of varying degrees of hypopituitarism after parturition. [1]. A fluctuating degree of hypopituitarism has been reported in thirty - two percent of women with severe postpartum hemorrhage. [2, 3] Hypopituitary adults with growth hormone (GH) deficiency have peculiar body composition with enlarged fat mass. [4]

Patients with hypopituitarism (particularly women) receiving conventional replacement therapy have higher cardiovascular mortality and morbidity than the general population. [5]The exact mechanism of increased vascular disease in hypopituitarism and the causal relationship to GH deficiency is still unclear. [6]However, changes in carbohydrate and lipid metabolism and body composition may likely play a major role. [7]In GH deficient hypopituitary adults, GH therapy after 52 weeks of treatment, caused a significant decrease in the percentage of fat and leptin affecting body fat percentage. [7 - 11]. sheeshan syndrome patients have documented a higher prevalence of coronary calcium score as compared to age - matched healthy controls,. Based on this background, the present study was conducted to evaluate the lipids in SSsubjects at a tertiary care center.

2. Material and methods

Sixty one SS patients in a period of three years, who attended Endocrine Clinic of Internal Medicine at Government Medical College, Srinagar were enrolled in the present study. This included newly diagnosed cases and the patients who were on follow - up. In addition, 44 age and BMI matched controls were recruited from hospital staff and friends. A written well - informed consent was taken from all subjects and the study was performed according to the Declaration of Helsinki 1975.

The diagnosis of SS was based on history of postpartum haemorrhage and/or failure of lactation and/or amenorrhea following last child birth, more than one anterior pituitary hormone deficiency and/or empty sella on MR imaging. Fasting early morning (08: 30 AM) blood samples were collected for glucose, follicle - stimulating hormone (FSH), luteinizing hormone (LH), cortisol, thyroid stimulating hormone (TSH), total T4, Prolactin (PRL), Growth hormone after overnight fast (10 to 12 hours). In addition samples were also collected in separate vacutainers for biochemical assays like liver function tests and lipid profile.

Statistical Analysis

Statistical analysis was done using SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean±SD and categorical variables were summarized as percentages. Chi - square test or Fisher's exact test, whichever appropriate, was used for comparison of categorical variables. Graphically the data was presented by bar and pie diagrams. *P* - value of less than 0.05 was considered statistically significant.

3. Results

The mean age of patients and controls was55.7±8.2years and 48±4.24 years respectively. The duration of treatment in

cases ranged from 2 monthsto 16 years. Out of the 61 SS subjects, 41 (67.21%) had a BMI in the normal range i. e. (18.5 - 22.9), 13 (21.31%) were overweight (BMI 23 - 24.9) and only 7 (11.47%) cases were obese (BMI of >25). The detail of the clinical profile is given in Table 1. Our study also revealed that the Sheehan's syndrome patients showed significantly higher mean triglyceride (224 vs 154 mg/dl; P<0.005), total cholesterol (231vs 173mg/dl; P = 0.008) and LDL cholesterol (127vs 63mg/dl; P = 0.005) and lower HDL cholesterol concentrations (43 vs 49 mg/dl; P = 0.04) on conventional replacement therapy.

At least one hormone deficiency was present in all of the patients and details of anterior pituitary functions are shown in Table no2.

Forty - three (70.49%) out of 61 cases had blood glucose less than 100 mg/dl, eleven (18.03%) had levels between 100 and 126 mg/dl, and seven (11.47) patients had levels >126 mg/dl. The details of the biochemical profile in these subjects is given inn Table 3.

4. Discussion

SS classically refers to postpartum hypopituitarism due to pituitary necrosis occurring secondary to massive bleeding at or just after delivery. [1]Pituitary insufficiency in SS may be in the form of partial or complete hormone insufficiency. [12]Severe growth hormone deficiency is an established feature of Sheehan's syndrome and growth hormone deficiency is associated with abnormal body composition, altered lipid profile, reduced quality of life and osteoporosis. Replacement with recombinant GH results in significant improvements in most of these altered parameters. While severe GH deficiency is a well - established feature of Sheehan's syndrome, the effects of growth hormone deficiency in these patients has not been extensively investigated. Our study also revealed that the Sheehan's syndrome patients showed significantly higher mean triglyceride (224 vs 154 mg/dl; P<0.005), total cholesterol (231vs 173mg/dl; P = 0.008) and LDL cholesterol (127vs 63mg/dl; P = 0.005) and lower HDL cholesterol concentrations (43 vs 49 mg/dl; P = 0.04) on conventional replacement. These findings were consistent with Bhat MA et al [14]who found total cholesterol (5.21 ± 0.98 mg/dl vs 4.57 ± 0.88 mg/dl, *P*<0.001), LDL - cholesterol (3.15 ± 0.90 mg/dl vs 2.67 ± 0.75 mg/dl; *P* = 0.02), and triglycerides (2.14 ± 1.00 mg/dl vs 1.43 ± 0.45 mg/dl; *P* = 0.00) were significantly higher in patients with SS andOzbey N et al [15] who studied serum lipid and leptin concentrations in hypopituitary patients with GH deficiency. Hypopituitary patients with GH deficiency showed significantly higher TG, LDL cholesterol and lower HDL cholesterol concentrations on conventional replacement therapy. Anna Bohdanowicz - Pawlak et al [16] also observed that the HDL - chol level was lower and the TG level higher in hypopituitary patients than in controls. Serum concentrations of total cholesterol in both GH deficency patients and controls were not significantly different. The level of LDL - chol was significantly higher in GH deficiency women, while in men the difference was not statistically significant. Similar findings were reported by Bulow B, Hagmar L et al [17] who reported that in untreated GH - deficient adults, levels of total cholesterol, LDL - cholesterol, triglycerides and apolipoprotein B were increased, and HDL - cholesterol levels reduced compared with those in healthy adults. F. Tanriverdi, K. Unluhizarci et al [18] also reported that At baseline mean total cholesterol, LDL - cholesterol and triglyceride levels were higher than the normal reference ranges but HDL - cholesterol levels were within the lower normal range. .

5. Conclusion

The study conclusively demonstrates that Sheehans syndrome patients exhibit significant lipid profile abnormalities. This underscores the necessity for comprehensive lipid management in these patients, potentially including lipid - lowering medications. Future research should focus on the long - term outcomes and optimal management strategies for lipid abnormalities in SS patients. Whether this is a result of the adverse effects of GH deficiency on body composition needs to be elucidated and further studies need to be carried out. Further it also needs to be determined whether these patients need lipid lowering drugs for long term management and improvement of survival.

Conflict of Interest:
The authors have no conflict of interest.

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Clinical profile of patients with Sheehan syndrome

Table 1

Parameters	Cases (n = 61)	
	No.	%age
History of Post Partum Hemorrhage	54	88.52
Failure of Lactation	51	83.60
H/o blood transfusions	28	45.90
Secondary Amenorrhea	57	93.44
Empty sella on MRI	53	86.88
Hyponatremia	24	39.34

Table 2: Hormonal Profile in patients with Sheehan syndrome

Parameters	Mean
FSH (mIU/ml)	3.54±0.64
LH (mIU/ml)	1.33±0.76
GH (ng/ml)	*0.25±0.12
Cortisol (µg/d) l	*2.9±1.83
TSH (mIU/L)	1.43±1.5
T4 (ng/dl)	0.78±0.61
T3 (pg/dl)	1.23±0.45
PRL (ng/ml)	*3.44±1.65

T3, tri-iodothyronine; T4, thyroxine; TSH, thyroid stimulating hormone; FSH, follicle stimulating hormone; LH, luteinizing hormone; GH, growth hormone. *Peak values after insulin tolerance test. Hormone assays performed with specific radioim. munoassay. Data are expressed in frequency, mean (± SD).

Table 3: Biochemical Profile in patients with Sheehan syndrome

Parameters	Cases	Controls	P value
TG (mg/dl)	231±68.95	154±54.96	<0.005
HDL (mg/dl)	43±8.27	48±6.82	0.04
Cholesterol (mg/dl)	231.8±30.6	175.0±29.5	0.008
LDL (mg/dl)	127.07±15.3	64.5±20.76	0.005
Fasting blood Glucose (mg/dl)	103.4±18.9	106.5	0.2

TG; Triglycerides, LDL; Low - density lipoproteins, HDL; High - density lipoproteins.