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COMPARISON BETWEEN PATIENTS WITH POLYCYSTIC OVARY SYNDROME AND CONTROLS IN TERMS OF FASTING SERUM TRIGLYCERIDE LEVELS IN OBESE PATIENTS

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Abstract:

Introduction: *Polycystic ovary syndrome (PCOS) is an endocrine problem with the set of symptoms such as irregular mensuration, subfertility, acne vulgarius and hirustism in women due to hyperandrogenism. PCOS women in general have dyslipidemia, obesity, type 2 diabetes, cardiovascular abnormalities, endometrial cancer and ovarian cancer too. PCOS patients have abnormal levels of triglycerides, cholesterol and LDL. The serum triglyceride levels (TGL) affected more as compared to other lipid parameters. Elevated levels of triglyceride put the PCOS patients to an increased risk of cardiovasular complications and metabolic perturbations.*

In addition to many efforts being put in establishing the association between aforementioned diseases and the PCOS internationally, this study is focused on determining the relationship between higher levels of fasting serum triglyceride and the PCOS.

Objectives*: Comparison between patients with polycystic ovary*

Syndrome and controls in terms of fasting serum triglyceride levels in obese patients.

Material and Methods

Study Design: *Comparative cross sectional study*

Setting: *Study was conducted in Obstetrics and Gynaecology Department, District Headquarter Hospital, Gujranwala.*

Subjects: *100 subjects equally divided in 50 women with diagnosed PCOS and 50 women with no PCOS. Each subject group is selected in such a fashion that it further subdivides into 25 women with known family history of dyslipidemia and 25 women with no known family history of dyslipidemia.*

Study Duration: *Six months after the approval of synopsis (from 13th Jan 2018).*

Results: *Mean age of the total population is 27.57 years. Mean age of the PCOS cases is 28.48 years. Mean age of the controls is 26.66 years. Mean of BMIs of total population is 31.849 Kg/m2. Means of BMIs of cases and controls are 31.844 Kg/m2 and 31.854 Kg/m2 respectively. Mean of Serum Triglyceride of total population is 257.62 mg/dl. Means of Serum Triglyceride of cases and controls are 285.46 mg/dl and 229.78 mg/dl respectively. Serum Triglyceride and PCOS have a significant likelihood. PCOS and non-PCOS women have significantly different mean values of Serum Triglyceride. A significant 8.2% variance in Serum Triglyceride is correlated to PCOS. Serum Triglyceride and Family History of Dyslipidemia have significant likelihood. BMI and PCOS have no significant association. BMI and Family History of Dyslipidemia have no significant relation. PCOS and Family History of Dyslipidemia have no significant connection. A significant 24.9 % variance in Serum Triglyceride is because of BMI.*

Conclusion: *A significant likelihood between Serum Triglyceride and PCOS is found. Also, PCOS and non-PCOS women are found to have significantly different mean values of Serum Triglyceride. This study found an 8.2% variance in Serum Triglyceride is correlated to PCOS as both had a significant correlation too. These findings corroborate the hypothesis of association between the Serum Triglyceride and PCOS.*

Keywords: *PCOS, Serum Triglyceride, TGL, BMI, Family History of Dyslipidemia.*

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INTRODUCTION:

Polycystic ovary syndrome (PCOS) is recognized as the most common endocrinopathy in reproductive-aged women. It is one of the most common causes of infertility. Its prevalence is 4-12% among women with child bearing age.[1] Women with PCOS have the abnormalities in the metabolism of androgens and estrogens and there is problem in the control of production of androgens. Over the years, many diagnostic criteria for the PCOS have been advised but the Rotterdam criteria have been followed in most of the literature.[2]

The PCOS is associated with the manifestations of metabolic syndrome along with endocrinal and gynecological features. The metabolic syndrome may show in the form of central obesity, insulin resistance, high blood pressure or increased serum lipid levels.[3] All these metabolic factors lead to more chances of cardiovascular and cerebrovascular disease at early age as compared to healthy individuals. The early control of these factors lead to good prognosis of the disease.[4] Recent studies show that increased TGL are more important than cholesterol level.[5] The patients with PCOS have more chance of diabetes mellitus and cardiovascular complications.[6]

MATERIAL AND METHODS:

Setting: Obstetrics and Gynaecology Department, District Headquarter Hospital, Gujranwala**.**
Duration Of Study: Six months after the approval of synopsis (from 13th Jan 2018).
Sample Size: Sample size of 100 cases is calculated with 95% confidence interval and absolute precision of 0.10, taking anticipated PCOS prevalence of 16.6%.
Sampling Technique: Non-probability consecutive sampling.
Sample Selection:
Inclusion Criteria:

- Patients with body mass index (BMI) ≥30 kg/m2
- Patients with menstrual irregularities
- Patients with the age range between 20 to 45 years.

Exclusion criteria:

- Immunocompromised patients including
- Corticosteroid therapy.
- Previous history of any chemotherapy or
- Radiotherapy, any history of repeated infections.
- H/o drug or alcohol abuse.
- Patients with deranged liver and kidney functions
- Patients already taking the medications for the hyperlipidemia
- Pregnant patients and patients with breast feeding.

STUDY DESIGN:

Comparative cross sectional study.

RESULTS:

Frequency of subjects:
A total population of 100 obese subjects is used for this statistical analysis. 50 patients of affirmative PCOs and 50 controlled subjects are selected in such a fashion that each group further subdivides itself into 25 subjects with family history of Dyslipidemia and 25 subjects with no known history of Dyslipidemia. **(See Figure 2, Figure 3 and Table 1)**

Descriptives of subjects:
Mean age of the total population is 27.57 years. While mean age of the PCOS cases is 28.48 years and mean age of the controls is 26.66 years. Similarly, mean of BMIs of total population is 31.849 Kg/m2 and means of cases and controls are 31.844 Kg/m2 and 31.854 Kg/m2 respectively. Also mean of Serum Triglyceride of total population is 257.62 mg/dl and means of cases and controls are 285.46 mg/dl and 229.78 mg/dl respectively. **(See Table 2)**

Association Between Serum Triglyceride And Pcos:

To find out the association between Serum Triglyceride and PCOS, four types of test methods naming Chi-Square Test, Independent Sample t-Test, ANOVA and Pearson Correlation Analysis were applied using SPSS. In Chi-Square Test (**Table 3**), since the assumption of minimum expected cell count less than 5 is violated so we have to look at the likelihood ratio, the p-value of the likelihood ratio is smaller than 0.05, which means we have to reject the null hypothesis of the independency of the two variables i.e. there is a significant likelihood between Serum Triglyceride and PCOS. Independent Sample t-Test (Table 4 and Table 5) revealed significant difference (because p-value is less than 0.05) between the Serum Triglyceride in PCOS Cases and Controls by comparing the means of Serum Triglyceride values. ANOVA (Table 6 and Table 7) results too showed a significant variance between the Serum Triglyceride in PCOS Cases and Controls because p-value is less than 0.05. In Pearson Correlation Analysis (Table 21), we can see from the table, Pearson Correlation Coefficient value is 0.287, which shows fairly strong relationship between the directional proportionality of the two indicators under discussion. Also p-value is quite bit less than 0.05 which means that this relationship is significant too. We can also calculate the magnitude of this proportionality by squaring the Pearson Correlation Coefficient which equals to 0.082, which tells us that 8.2% variance in Serum Triglyceride is correlated to PCOS.

Association between serum triglyceride and family history of dyslipidemia:

Similarly, to find out the association between Serum Triglyceride and Family History of Dyslipidemia, four types of test methods naming Chi-Square Test, Independent Sample t-Test, ANOVA and Pearson Correlation Analysis were applied using SPSS. In Chi-Square Test (Table 8), since the assumption of minimum expected cell count less than 5 is violated so we have to look at the likelihood ratio, the p-value of the likelihood ratio is smaller than 0.05, which means we have to reject the null hypothesis of the independency of the two variables i.e. there is a significant likelihood between Serum Triglyceride and Family History of Dyslipidemia. Independent Sample t-Test (Table 9 and Table 10) revealed no significant difference (because pvalue is greater than 0.05) between the Serum Triglyceride in women with Family History of Dyslipidemia and no Family History of Dyslipidemia by comparing the means of Serum Triglyceride values. ANOVA (Table 11 and Table 12) results showed an insignificant variance between the Serum Triglyceride in women with Family History of Dyslipidemia and no Family History of Dyslipidemia because p-value is greater than 0.05. In Pearson Correlation Analysis (Table 22), we can see from the table, p-value is greater than 0.05.

Which means that the correlation between Serum Triglyceride and Family History of Dyslipidemia is insignificant. This insignificant correlation could be because of the fact that our study is purely focused on obese patients; which means, obese patients had higher Serum Triglyceride whether they had family history or not. These higher test results of Serum Triglycerides made the distinction of the impact of Family History of Dyslipidemia inconsequential.

Association between bmi and pcos:

Also, to find out the association between BMI and PCOS, four types of test methods naming Chi-Square Test, Independent Sample t-Test, ANOVA and Pearson Correlation Analysis were applied using SPSS. In Chi-Square Test (**Table 13**), since the assumption of minimum expected cell count less than 5 is violated so we have to look at the likelihood ratio, the p-value of the likelihood ratio is much higher than 0.05, which means we cannot reject the null hypothesis of the independency of the two variables i.e. no significant association between BMI and PCOs is found. Independent Sample t-Test (**Table 14** and **Table 15**) revealed insignificant difference (because p-value is much higher than 0.05) between the BMI in PCOS Cases and Controls by comparing the means of BMI values. ANOVA (**Table 6** and **Table 7**) results show that there isn‘t any significant variance between the BMI in PCOS Cases and Controls because p-value is much higher than 0.05. In Pearson Correlation Analysis (**Table 21**), we can see from the table, p-value is greater than 0.05 which means that the correlation between BMI and PCOS is insignificant.

Association between bmi and family history of dyslipidemia:

Similarly, to find out the association between BMI and Family History of Dyslipidemia, four types of test methods naming Chi-Square Test, Independent Sample t-Test, ANOVA and Pearson Correlation Analysis were applied using SPSS. In Chi-Square Test (**Table 16**), since the assumption of minimum expected cell count less than 5 is violated so we have to look at the likelihood ratio, the p-value of the likelihood ratio is much higher than 0.05, which means we cannot reject the null hypothesis of the independency of the two variables i.e. no significant association between BMI and Family History of Dyslipidemia is found. Independent Sample t-Test (**Table 17** and **Table 18**) revealed insignificant difference (because p-value is much higher than 0.05)

between the BMI in women with Family History of Dyslipidemia and no Family History of Dyslipidemia by comparing the means of BMI values. ANOVA (**Table 11** and **Table 12**) results show that there isn't any significant variance between the BMI in women with Family History of Dyslipidemia and no Family History of Dyslipidemia because p-value is much higher than 0.05. In Pearson Correlation Analysis (**Table 22**), we can see from the table, p-value is greater than 0.05 which means that the correlation between BMI and PCOS is insignificant.

Association between pcos and family history of dyslipidemia:

To find out the association between PCOS and Family History of Dyslipidemia Chi-Square Test is applied using SPSS. In Chi-Square Test (**Table 19** & **Table 20**), since the assumption of minimum expected cell count less than 5 is not violated so we look at the Pearson Chi-Square value, the p-value of the likelihood ratio is much higher than 0.05, which means we cannot reject the null hypothesis of the independency of the two variables i.e. no significant association between PCOS and Family History of Dyslipidemia is found.

Association between serums:

Triglyceride And Bmi:

Serum Triglyceride showed a strong correlation with BMI. In Pearson Correlation Analysis (**Table 21**), we can see from the table, Pearson Correlation Coefficient value is 0.499, which shows fairly strong relationship between the directional proportionality of the two indicators under discussion. Also p-value is quite bit less than 0.05 which means that this relationship is significant too. We can also calculate the magnitude of this proportionality by squaring the Pearson Correlation Coefficient which equals to 0.249, which tells us that 24.9 % variance in Serum Triglyceride is because of BMI. However, Serum Triglyceride correlation with BMI is more vivid in PCOS women than in non-PCOS women, as shown in scattered plot too (**Figure 4**). Similarly, Serum Triglyceride correlation with BMI is more vivid in women with family history than in women with no history, as shown in scattered plot too (**Figure 5**).

FIGURES:

Figure 2: Frequency of PCOS cases and Controls

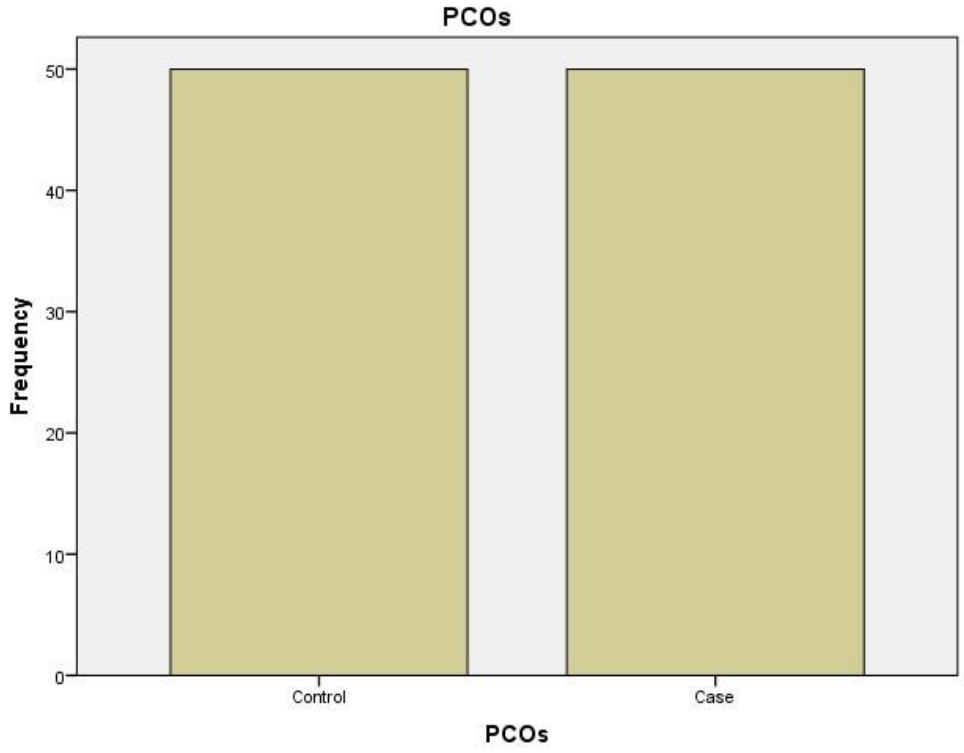


Figure 3: Frequency of family history of dyslipidemia

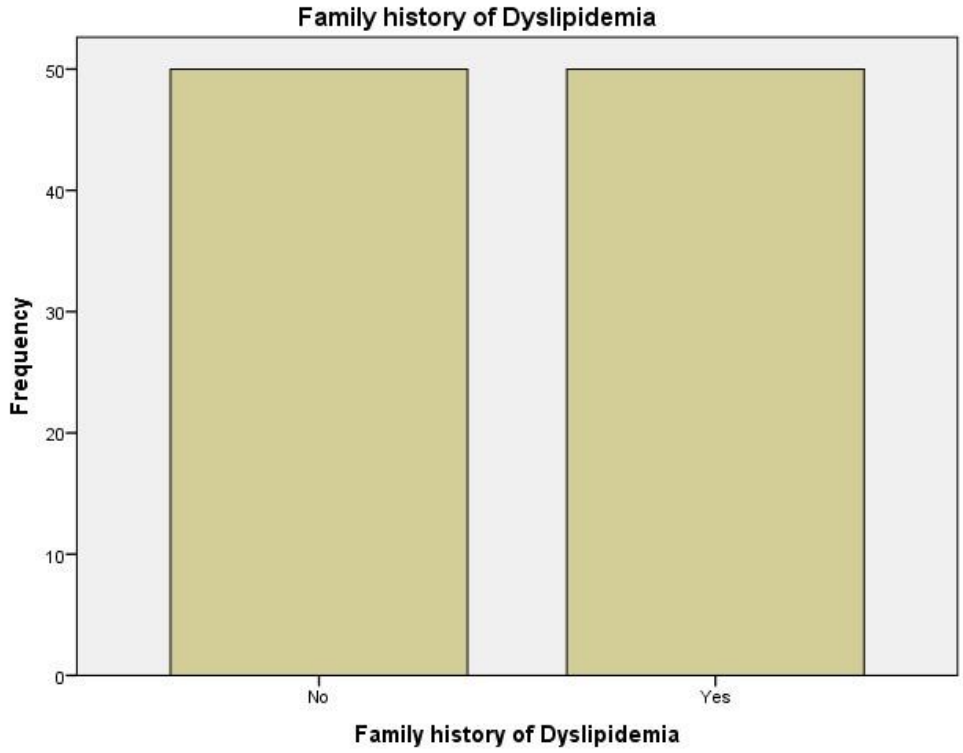


Figure 4: Scattered Plot of Serum Triglyceride and BMI w.r.t PCOS

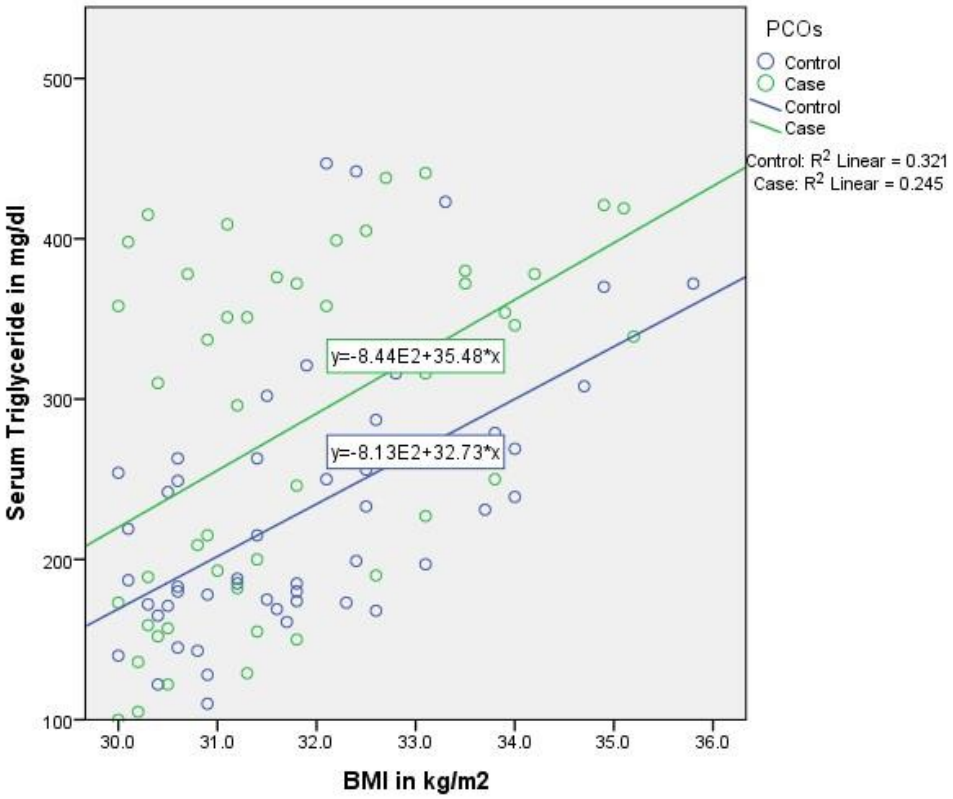
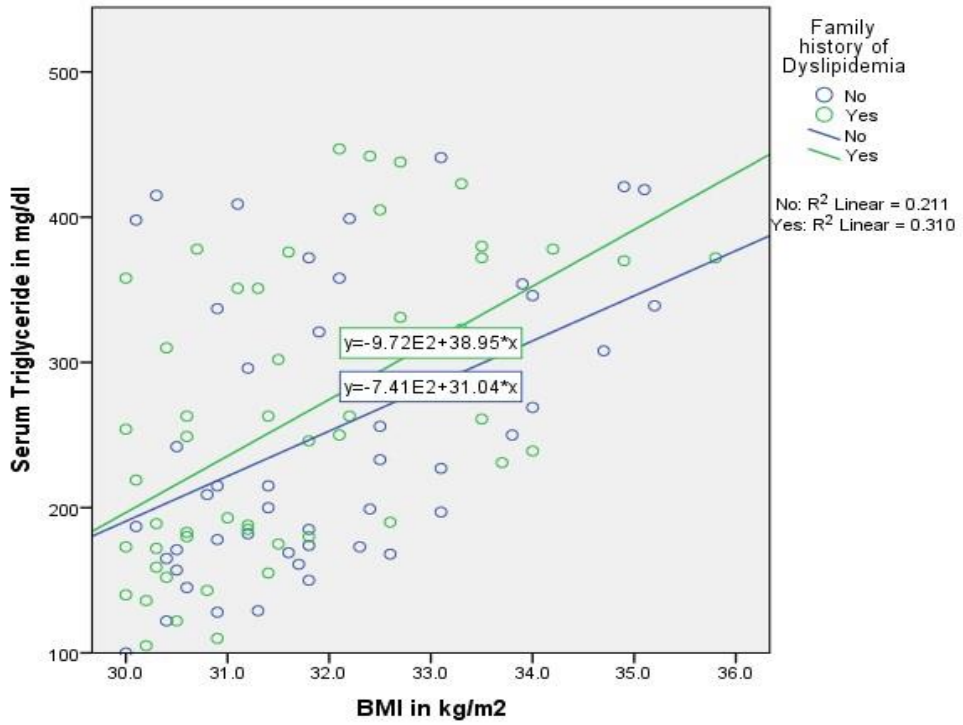


Figure 5: Scattered Plot BMI and Serum Triglyceride w.r.t Family History of Dyslipidemia



TABLES:

Table 1: Sample size and attributes

	Family history of Dyslipidemia	No family history of Dyslipidemia	Total
PCOs Case	25	25	50
Control	25	25	50
Total	100		

Table 2: Means and std. deviation of Age, BMI and Serum Triglyceride

		Age (years)	BMI (Kg/m2)	STGa (mg/dl)
Mean	Cases	28.48	31.844	285.46
	Controls	26.66	31.854	229.78
	FHDb	27.42	31.666	261.50
	No FHD	27.72	32.032	253.74
	All	27.57	31.849	257.62
Std. Deviation	Cases	4.24	1.4711	105.392
	Controls	3.34	1.4006	80.899
	FHDb	3.88	1.4307	100.149
	No FHD	3.96	1.4180	95.777
	All	3.942	1.429	97.569

a. Serum triglyceride
b. Family history of dyslipidemia

Table 3: Association between Serum Triglyceride and PCOS Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	84.667a	85	.490
Likelihood Ratio	117.128	85	.012
Linear-by-Linear Association	8.142	1	.004
N of Valid Cases	100		

a. 172 cells (100.0%) have expected count less than 5. The minimum expected count is .50.

Table 4: Comparison of means of Serum Triglyceride w.r.t. PCOS Group Statistics

	PCOs	N	Mean	Std. Deviation	Std. Error Mean
Serum Triglyceride in mg/dl	Control	50	229.78	80.899	11.441
	Case	50	285.46	105.392	14.905

Table 5: Independent Sample t-Test of Serum Triglyceride w.r.t PCOS Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Serum Triglyceride in mg/dl	Equal variances assumed	11.548	.001	2.963	98	.004	-55.680	18.789	92.967	-18.393
	Equal variances not assumed			2.963	91.862	.004	-55.680	18.789	92.998	-18.362

Table 6: ANOVA of BMI and Serum Triglyceride w.r.t PCOS ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
BMI in kg/m2	Between Groups	.002	1	.002	.001	.972
	Within Groups	202.167	98	2.063		
	Total	202.170	99			
Serum Triglyceride in mg/dl	Between Groups	77506.560	1	77506.560	8.782	.004
	Within Groups	864953.000	98	8826.051		
	Total	942459.560	99			

Table 7: Descriptives of ANOVA of BMI and Serum Triglyceride w.r.t PCOS Descriptive

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
BMI in kg/m2	Control	50	31.854	1.4006	.1981	31.456	32.252	30.0	35.8
	Case	50	31.844	1.4711	.2080	31.426	32.262	30.0	35.2
	Total	100	31.849	1.4290	.1429	31.565	32.133	30.0	35.8
Serum Triglyceride in mg/dl	Control	50	229.78	80.899	11.441	206.79	252.77	110	447
	Case	50	285.46	105.392	14.905	255.51	315.41	100	441
	Total	100	257.62	97.569	9.757	238.26	276.98	100	447

Table 8: Association between Serum Triglyceride and Family History of Dyslipidemia Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	87.333a	85	.410
Likelihood Ratio	120.947	85	.006
Linear-by-Linear Association	.158	1	.691
N of Valid Cases	100		

a. 172 cells (100.0%) have expected count less than 5. The minimum expected count is .50.

Table 9: Comparison of means of Serum Triglyceride w.r.t. Family History of Dyslipidemia Group Statistics

	Family history of Dyslipidemia	N	Mean	Std. Deviation	Std. Error Mean
Serum Triglyceride in mg/dl	No	50	253.74	95.777	13.545
	Yes	50	261.50	100.149	14.163

Table 10: Independent Sample t-Test of Serum Triglyceride w.r.t Family History of Dyslipidemia

Independent Samples Test

		Leven e's Test for Equali ty of Varia nces		t-test for Equality of Means						
		F	Si g.	t	df	Sig . (2tail ed)	Mean Differ ence	Std. Error Differ ence	95% Confiden ce Interval of the Differenc e Low er	Upp er
Serum Triglyc eride in mg/dl	Equal varia nces assu med	.0 8 2	.7 7 5	.3 9 6	98	.69 3	- 7.760	19.59 8	46. 651	31. 131
	Equal varia nces not assu med			.3 9 6	97. 805	.69 3	- 7.760	19.59 8	46. 652	31. 132

Table 11: ANOVA of BMI and Serum Triglyceride w.r.t Family History of Dyslipidemia ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
BMI in kg/m2	Betwee n Groups	3.349	1	3.349	1.651	.202
	Within Groups	198.821	98	2.029		
	Total	202.170	99			
Serum Triglycerid e in mg/dl	Betwee n Groups	1505.440	1	1505.44 0	.157	.693
	Within Groups	940954.12 0	98	9601.57 3		
	Total	942459.56 0	99			

Table 12: Descriptives of ANOVA of BMI and Serum Triglyceride w.r.t Family History of Dyslipidemia

Descriptives

					95% Confidenc e Interval for Mean			
	N	Mea n	Std. Devia tion	Std. Erro r	Low er Bou nd	Upp er Bou nd	Mini mum	Maxi mum
BMI in No kg/m2 Ye s	50	32.032	1.418 0	.2005	31.629	32.435	30.0	35.2
To tal	50 1 00	31.666	1.430 7	.2023	31.259	32.073	30.0	35.8
	0	31.849	1.429 0	.1429	31.565	32.133	30.0	35.8
Serum No Triglyc eride in Ye mg/dl s	50	253.74	95.77 7	13.545	226.52	280.96	100	441
To tal	50 1 00	261.50	100.1 49	14.163	233.04	289.96	105	447
	0	257.62	97.56 9	9.757	238.26	276.98	100	447

Table 13: Association between BMI and PCOS Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.400a	40	.633
Likelihood Ratio	48.896	40	.158
Linear-by-Linear Association	.001	1	.972
N of Valid Cases	100		

a. 82 cells (100.0%) have expected count less than 5. The minimum expected count is .50.

Table 14: Comparison of means of BMI w.r.t PCOS Group Statistics

	PCOs	N	Mean	Std. Deviation	Std. Error Mean
BMI kg/m2	in Control	50	31.854	1.4006	.1981
	Case	50	31.844	1.4711	.2080

Table 15: Independent Sample t-Test of BMI w.r.t. PCOS Independent Samples Test

	Leven e's Test for Equali ty of Varian ces		t-test for Equality of Means						
								95% Confide nce Interval of the Differen ce	
	F	Si g.	t	df	Sig. (2tail ed)	Mean Differ ence	Std. Error Differ ence	Lo wer	Up per
BMI Equal in varia kg/ nces m2 assu med	.471	.494	.035	98	.972	.0100	.2873	-.5601	.5801
Equal varia nces not assu med			.035	97.765	.972	.0100	.2873	-.5601	.5801

Table 16: Association between BMI and Family History of Dyslipidemia Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.733a	40	.482
Likelihood Ratio	51.843	40	.099
Linear-by-Linear Association	1.640	1	.200
N of Valid Cases	100		

a. 82 cells (100.0%) have expected count less than 5. The minimum expected count is .50.

Table 17: Comparison of means of BMI w.r.t Family History of Dyslipidemia Group Statistics

	Family history of Dyslipidemia	N	Mean	Std. Deviation	Std. Error Mean
BMI in kg/m2	No	50	32.032	1.4180	.2005
	Yes	50	31.666	1.4307	.2023

Table 18: Independent Sample t-Test of BMI w.r.t. Family History of Dyslipidemia Independent Samples Test

	Leven e's Test for Equali ty of Varian ces		t-test for Equality of Means						
								95% Confide nce Interval of the Differen ce	
	F	Si g.	t	df	Sig. (2tail ed)	Mean Differ ence	Std. Error Differ ence	Lo wer	Up per
BMI Equal in varia kg/ nces m2 assu med	.002	.963	1.285	98	.202	.3660	.2849	-.1993	.9313
Equal varia nces not assu med			1.285	97.992	.202	.3660	.2849	-.1993	.9313

19: Cross Tabulation of PCOS vs Family History of Dyslipidemia Family history of Dyslipidemia * PCOs Crosstabulation Count

		PCOs		
		Control	Case	Total
Family history of Dyslipidemia	No	25	25	50
	Yes	25	25	50
Total		50	50	100

Table 20: Association between PCOS and Family History of Dyslipidemia Chi-Square Tests

	Value	df	Asymp. Sig. (2sided)	Exact Sig. (2sided)	Exact Sig. (1sided)
Pearson Chi-Square		1	1.000		
Continuity Correctionb	.000a				
Likelihood Ratio	.000	1	1.000		.579
Fisher's Exact Test	.000				
Linear-by-Linear	100	1	1.000		

N	Association of Cases	Valid			1.000	
			1	1.000		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 25.00. b. Computed only for a 2x2 table

Table 21: Correlation between BMI, Serum Triglyceride and PCOS Correlations

		BMI in kg/m2	Serum Triglyceride in mg/dl	PCOs
BMI in kg/m2	Pearson Correlation	1	.499**	-.004
	Sig. (2-tailed)		.000	.972
	N	100	100	100
Serum Triglyceride mg/dl	Pearson in Correlation	.499**	1	.287**
	Sig. (2-tailed)	.000		.004
	N	100	100	100
PCOs	Pearson Correlation	-.004	.287**	1
	Sig. (2-tailed)	.972	.004	
	N	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Table 22: Correlation between BMI, Serum Triglyceride and Family History of Dyslipidemia Correlations

1.		2. BMI in kg/m2	3. Serum 4. Triglyceride in mg/dl	5. Family history of 6. Dyslipidemia
7. BMI in 8. kg/m2	9. Pearson 10. Correlation	13. 1	14. .499**	15. -.129
	11. Sig. (2- 12. tailed)	16.	17. .000	18. .202
	19. N	20. 100	21. 100	22. 100
23. Serum 24. Triglyceride in mg/dl	25. Pearson 26. Correlation	27. .499**	28. 1	29. .040
	30. Sig. (2- 31. tailed)	32. .000	33.	34. .693
	35. N	36. 100	37. 100	38. 100
39. Family history of 40. Dyslipidemia	41. Pearson 42. Correlation	43. -.129	44. .040	45. 1
	46. Sig. (2- 47. tailed)	48. .202	49. .693	50.
	51. N	52. 100	53. 100	54. 100

**. Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION:

The PCOS is associated with the manifestations of metabolic syndrome along with endocrinal and gynaecological features. The metabolic syndrome appears in the form of central obesity, insulin resistance, high blood pressure or increased serum lipid levels.[184] PCOS women mostly have higher indicators of triglycerides.[185, 186] Cross examination of obese and lean PCOS women with comparable age and BMIs showed similar dyslipidemia.[187, 188] Recent studies show that increased TGL are more important than cholesterol level.[189]

Since this study is purely focused on obese women irrespective they being suffered from PCOS or not, they had overall higher expected values of Serum Triglyceride in both groups i.e. in PCOS and non-PCOS women. This study found a significant likelihood between Serum Triglyceride and PCOS. Also, PCOS and non-PCOS women were found to have significantly different mean values of Serum Triglyceride. This study found an 8.2% variance in Serum.

Triglyceride is correlated to PCOS as both had a significant correlation too. These findings corroborate the hypothesis of association between the Serum Triglyceride and PCOS.

Though this study found a significant likelihood between Serum Triglyceride and Family History of Dyslipidemia, but failed to establish any significant correlation between the Serum Triglyceride and Family History of Dyslipidemia. This insignificant correlation could be because of the fact that our study is purely focused on obese patients; which means, obese patients had higher Serum Triglyceride whether they had family history or not. These higher test results of Serum.

Triglycerides made the distinction of the impact of Family History of Dyslipidemia inconsequential as women with family history of dyslipidemia and no family history of dyslipidemia were expected to show comparable TGL levels.
Similarly, our study failed to establish a significant relationship between the BMI and PCOS or Family

History of Dyslipidemia, due to our study being focused only on obese patients with BMI ≥ 30. Also, this study failed to reveal any significant relationship between PCOS and Family History of Dyslipidemia. An unbiased study is necessary to truly reveal any association between aforementioned variables. This study also showed an expected result that 24.9 % variance in Serum Triglyceride is because of BMI.

Although it seems that different studies have reported conflicting results due to factors such as race, genetics, nutrition, lifestyle and economic difference in their study population. In light of this study lipid profile should be routinely offered to PCOS women so that by detecting abnormalities in lipid profiles soon and by adopting preventive measures could benefit these women from preventing incidence of cardiovascular events.

A study conducted by Rocha et al. In 2011, the incidence of dyslipidemia in patients with PCOS was twice more than control group (76.1% vs. 32.25%), that mostly as a decrease in HDL (57.6%) and increases in triglycerides(28.3%).[190] In another study that was led by Javadian et al. in 2011, women with polycystic ovary had higher levels of postprandial triglycerides, postprandial cholesterol, fasting blood glucose, insulin and waist-to- hip
ratio compared with the healthy control group.[191]

A case-control study was conducted on 153 women with PCOS and 449 healthy women as controls in Iran. Study showed the results that women with PCOS have higher levels of serum triglyceride.

The case-control study was conducted at the Department of Chemical Pathology, Liaquat National Hospital, Karachi, from March 2006 to April 2007. Study concluded 100 patients, 50 PCOS and 50 controls. Results of the study showed that serum triglyceride variance was 24% with PCOS women as compare to the healthy individuals.[192] The significance of raised TG concentrations in relation to cardiovascular disease is debatable, but high TG measurements in obese PCOS may be related to the increased risk of CHD in obese population in general.[193]
A prospective study was performed (since 2004–2008) on 181 PCOS and 90 age and BMI matched controls in Algeria. Study results showed that the prevalence of hypertriglyceridemia increased with BMI respectively 5.9, 14.6, and 16.9% for BMI <25; BMI 25–30 BMI more than 30.[194]

Different studies conducting on this topic in different parts of world have inconsistent results due to factors such as genetics, race, nutrition, lifestyle and financial variance in their selected populations. According to the obtainable results from our study it is recommended the need of lifestyle modification to all women with PCOS, especially the obese patients screened in terms of metabolic disorders.

CONCLUSION(S):

A significant likelihood between Serum Triglyceride and PCOS is found. Also, PCOS and non-PCOS women are found to have significantly different mean values of Serum
Triglyceride. This study found an 8.2% variance in Serum Triglyceride is correlated to PCOS as both had a significant correlation too. These findings corroborate the hypothesis of association between the Serum Triglyceride and PCOS.

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