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A CROSS-SECTIONAL RESEARCH TO COMPARE THE PROFILE OF LIPID AND CALCIUM SERUMS AMONG CHOLELITHIASIS PATIENTS

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Abstract:

Objective: *We aimed to analyze the average serum values of calcium and lipid profile in patients of cholelithiasis.*

Material and Methods: *Present research was cross-sectional in its design. The place of this research was Services Hospital, Lahore (February to September 2017). Overall, we selected 380 cholelithiasis patients and analyze the serum calcium and serum lipid.*

Results: *We enrolled in the research sample having average age as (43.180 ± 13.970) years. Whereas, the average serum values of calcium, HDL, LDL, TC and TG were respectively (11.550 ± 01.180), (40.21 ± 3.1), (137.98 ± 9.79), (204.27 ± 24.12) and (198.94 ± 72.12). The average value for every serum was measured while taking the unit value as Mg/dL. We also calculated average height (inches) and weight (kilograms) which was respectively (63.57 ± 4.14) inches and (54.30 ± 13.07) kilograms.*

Conclusion: *It is evident from the research outcomes that the gallstone disease incidence is more common among the female population than males. Females are more prone to disease onset than males and they are at an increased risk of gallstone. Various gallstones occurrences are also attributed to increased lipid and calcium serums; especially among females.*

Keywords: *Lipid Profile, Serum Calcium, Cholelithiasis and Gallstone.*

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INTRODUCTION:

Gallstone disease is very prevalent gastrointestinal disorder and it is common in ten to fifteen percent adult people of advanced nations [1]. Majority of the patients having that disease don't show symptoms [2]. Females are more vulnerable to having the disease of gallstone than male [1]. The gallbladder is an organ that has a shape like a pear with a length of nine centimetres having a volume of almost fifty millilitres. It contains fundus, figure and collar that spills within the cystic vessel. Liver discharged bile and gallbladder key feature of is to stock and distillate and after that transferring this into the intestine for fat digestion [2]. Activity, relaxation and concentration of gallbladder are because of a peptide hormone name cholecystokinin, released from duodenum and jejunum (from neuroendocrine cells) [3]. The bile having cholesterol in a high level gets concentrated it turned into a hard and crystalline form that cannot transfer into the intestine, here we call this as gallstone [4]. Stones in Gall's bladder are mostly cholesterol (fat) stones, whereas mixed and pigment stones constitute of bile pigments moreover bile salts are available too. Gall bladder's decreased activity is considered as a causal effect in the growth of gallstones [5]. Gallstones have three chief categories i.e., pure cholesterol stones comprise of cholesterol around 90%, pigment stones either black or brown comprise of bilirubin around 90%, and mixed composition stones having a different proportion of cholesterol calcium carbonate calcium palmitate, bilirubin, calcium phosphate [7]. We found no previous literary reference while consulting locally available research material about the said topic. Present outcomes will support in setting data (primary) in our selected people for finding likely part of diminished lipid profile and serum-calcium in the formation of gallstone in order to take precautionary measures for the patients of changed serum limits (lipid profile and serum Calcium).

MATERIAL AND METHODS:

The present research was cross-sectional in its design. The place of this research was Surgical Department of Services Hospital, Lahore (February to September 2017). We included male and female patients of gallstones having age 20 – 70 years. We did not include patients of terminal ileal (TI) resection, for example, Crohn's disease. Patients of acalculous gallbladder disease (ultrasound), foreign body CBD such as stents, liver cirrhosis (upon Abdominal Ultrasound), hemolysis (CBC film, sickle cell anaemia in history and CBC film, hereditary spherocytosis), and renal failure (RFT) and patient on antihyperlipidemic drugs. Gallstone is resolved sonographically through the existence of resonances in the lumen of gallbladder having clear aural shadowing and generally, transfer in connection to gravity (sign of rolling stone). We obtained consent from ethical board related to this hospital. Participants signed the consent form. We measured weight with weight machine (manual) and height with the help of tape, we calculated BMI for patients and history of diabetes mellitus. We take 05 ml venous sample of blood from patients then sent to a lab for analysis of serum calcium and lipid profile. We maintained the record of all the findings and demographic information on the specially designed form. We did an analysis of data on SPSS. We present a quantitative variable as mean ± SD e.g., BMI, weight & height, serum total cholesterol, serum (LDL), serum calcium, serum (HDL), serum tri-glycerides. We present a qualitative variable in percentages and frequency e.g., obesity, diabetes, and gender. We did Stratification for gender, age, obesity and diabetes. For Post stratification, we used t- test for seeing significance level. P value was considered significant as ($p= \leq 0.05$). we controlled other effect modifier by segregation method.

RESULTS:

We enrolled in the research sample having average age as (43.180 ± 13.970) years. Whereas, the average serum values of calcium, HDL, LDL, TC and TG were respectively (11.550 ± 01.180), (40.21 ± 3.1), (137.98 ± 9.79), (204.27 ± 24.12) and (198.94 ± 72.12). The average value for every serum was measured while taking the unit value as Mg/dL. We also calculated average height (inches) and weight (kilograms) which was respectively (63.57 ± 4.14) inches and (54.30 ± 13.07) kilograms. Among 380 gallstone patients, seventy-nine (21%) were male and three hundred one (79%) were female. In 380 patients 150 (39%) have diabetes, and 230 (61%) do not have diabetes. Among 380 patients 53 (14%) have obesity and 327 (39%) do not have obesity. We did stratification and made two age groups i.e., 20 to 45 years (182 patients) and 46 to 70 years (one hundred ninety-eight patients). Average serum values of calcium, HDL, LDL, total cholesterol and triglyceride in the age bracket of (20 – 45) years were respectively (11.61 ± 1.24), (40.35 ± 3.01), (137.67 ± 9.61), (201.47 ± 23.70) and (190.34 ± 60.31) which were measured while taking unit value as (mg/dl). Similarly, for the age bracket of (46 – 70) years the values of serum calcium, HDL, LDL, total cholesterol and triglyceride were respectively (11.49 ± 1.11), (40.07 ± 3.1), (138.26 ± 9.97), (206.84 ± 24.28) and (206.85 ± 80.83) with the same unit value. We applied T-test for the comparison of the average levels of serum calcium in two (2) groups. There is significant difference amid two groups i.e., p-value

0.030 and p-value 0.026 for average total cholesterol and average Serum triglyceride and insignificant difference between two groups having respective P-values 0.319, 0.373 and 0.558 for average serum calcium, HDL, LDL respectively. We did gender distribution of patients of gallstone and compared the total cholesterol, HDL, average serum calcium, LDL, and Serum triglyceride among of both the genders. In case of male patients average total cholesterol as 202.34 ± 22.43 (Mg/dL), HDL (average) as 40.52 ± 3.05 (Mg/dL), average serum calcium (average) as 11.57 ± 1.166 (Mg/dL), average LDL as 138.25 ± 9.72 (Mg/dL), and Serum triglyceride as 185.92 ± 55.36(Mg/dL), and in female patients Average serum calcium, HDL, LDL, Serum triglyceride and total cholesterol was as (11.55 ± 1.179), (40.12 ± 3.06), (137.90 ± 9.82), (204.77 ± 24.56) and (202.36 ± 75.62) respectively which were calculated in unit of Mg/dl. The p-values reflect an insignificant difference with respective P-values of 0.873, 0.301, 0.778, 0.426, 0.071 respectively for average serum values calcium, LDL, total cholesterol, HDL and average Serum triglyceride among groups of male and female. In present research average serum calcium, HDL, LDL, total cholesterol and Serum triglyceride of diabetes patients were respectively reported in Mg/dL as (11.49 ± 11.49), (40.17 ± 3.05), (138.68 ± 10.12), (205.83 ± 23.48) and (204.79 ± 82.813). Whereas, the average serum values of nondiabetics for calcium, HDL, LDL, TC and triglyceride were respectively reported in Mg/dL as (11.59 ± 1.20), (40.23 ± 3.05), (137.52 ± 9.54), (203.24 ± 24.53) and (195.12 ± 64.104). An insignificant difference was shown in respective P-values of 0.407, 0.852, 0.260, 0.310 and 0.20 respectively against average serum calcium, HDL, LDL, total cholesterol and Serum triglyceride among patients of diabetes and patients who do not have diabetes. In obesity patients average LDL was 140.40 ± 9.21 (Mg/dL), average HDL was 40.00 ± 2.79 (Mg/dL), average serum calcium and triglyceride was respectively measured in Mg/dL as (11.5889 ± 1.2244) and (202.21 ± 75.59) and average total cholesterol 205.25 ± 23.17 (Mg/dL) and in case of non-obese patients average LDL was 137.58 ± 9.83 (Mg/dL), average HDL was 40.24 ± 3.10 (Mg/dL), average serum calcium and triglyceride in Mg/dL were (11.543 ± 1.168) and (198.41 ± 71.64) respectively along with total cholesterol was 204.11 ± 24.30 (Mg/dL). There is the insignificant difference for average serum calcium, average HDL, average LDL, average total cholesterol and average Serum triglyceride P-Values were 0.795, 0.597, 0.750 and 0.723. Whereas, for LDL the difference was (P-Value 0.052) in both non-obese and obese patients.

Table – I: Age, Gender, Diabetes Mellitus and Obesity Stratification

Variables		Number
Age (Years)	20 - 45 Years	182
	46 - 70 Years	198
Gender	Male	79
	Female	301
Diabetes Mellitus	Diabetic	150
	Non-diabetic	230
Obesity	Obese	53
	Non-obese	327

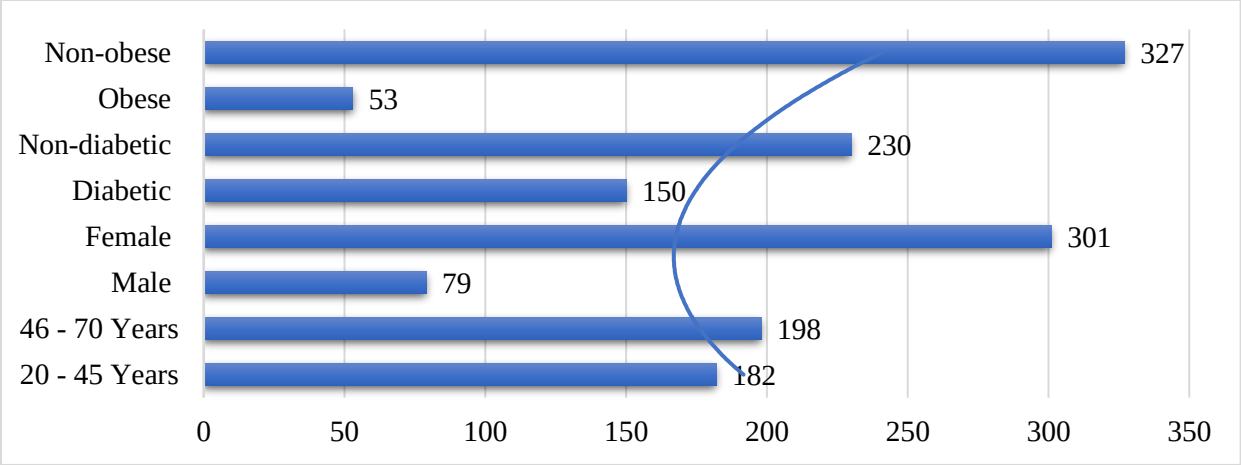

Table – II: Serum Values (Mean and SD)

Mean and SD	Mean	±SD
Age in years	43.18	13.97
Cal (mg/dl)	11.55	1.18
HDL (mg/dl)	40.21	3.1
LDL (mg/dl)	137.98	9.79
TC (mg/dl)	204.27	24.12
TG (mg/dl)	198.94	72.12
Weight in KG	54.3	13.07
Height in inches	63.57	4.14

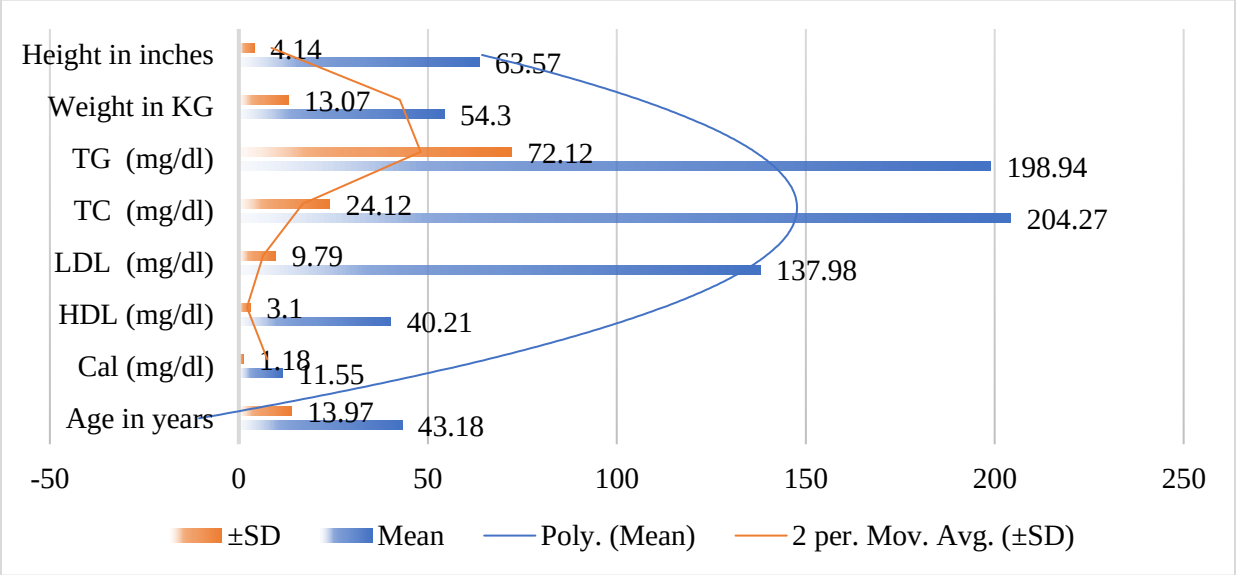

Table – III: Gender, Diabetes Mellitus and Obesity Distribution

Variables		Number	Percentage
Gender	Male	79	21
	Female	301	79
Diabetes Mellitus	Diabetic	150	39
	Non-Diabetic	230	61
Obesity	Obese	53	14
	Non-Obese	327	86

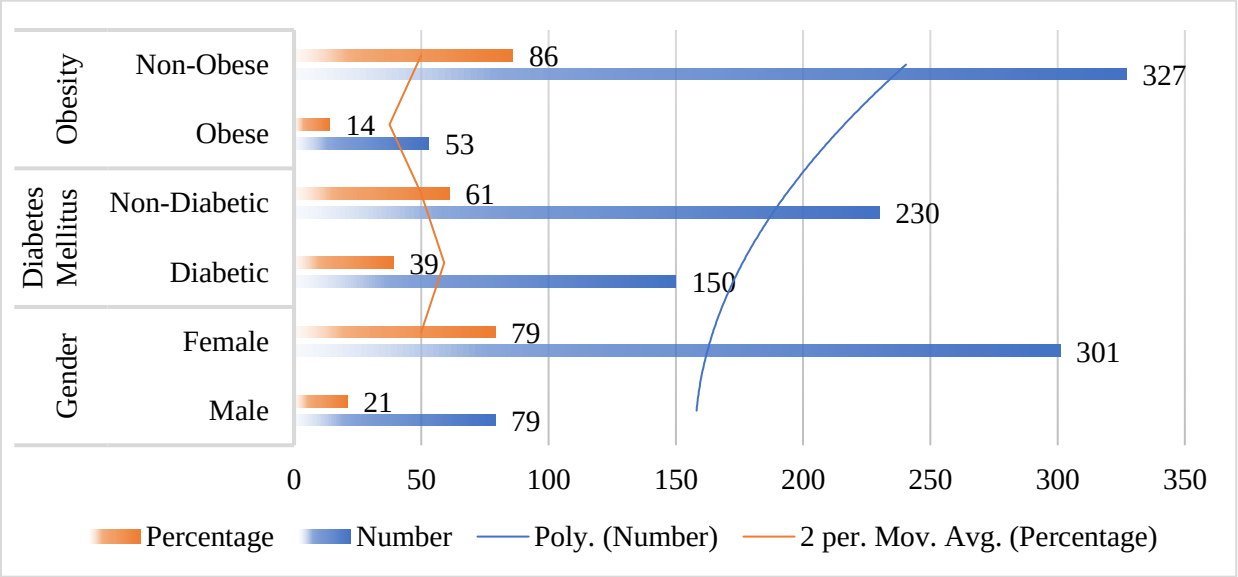

Table – IV: Average Values of Calcium, HDL, LDL, TC and TG (Mean and SD)

Values in (mg/dl)		Calcium		HDL		LDL		TC		TG	
		Mean	±SD	Mean	±SD	Mean	±SD	Mean	±SD	Mean	±SD
Age (Years)	20 – 45	11.61	1.24	40.35	3.01	137.7	9.61	201.5	23.7	190.3	60.31
	46 – 70	11.49	1.11	40.07	3.1	138.3	9.97	206.8	24.3	206.9	80.83
Gender	Male	11.57	1.17	40.52	3.05	138.3	9.72	202.3	22.4	185.9	55.36
	Female	11.55	1.18	40.12	3.06	137.9	9.82	204.8	24.6	202.4	75.62
Diabetes Mellitus	Diabetic	11.49	1.13	40.17	3.05	138.7	10.1	205.8	23.5	204.8	82.813
	Non-diabetic	11.59	1.2	40.23	3.05	137.5	9.54	203.2	24.5	195.1	64.104
Obesity	Obese	11.59	1.22	40	2.79	140.4	9.21	205.3	23.2	202.2	75.59
	Non-obese	11.54	1.17	40.24	3.1	137.6	9.83	204.1	24.3	198.4	71.64
P-Value		0.319		0.373		0.558		0.030		0.023	

DISCUSSION:

In aetiology of cholelithiasis job of serum lipids is vital and for the cholesterol gallstones, the average values of serum lipid are altered clearly indicating about a disorder named as a metabolic disorder [8]. Gallstones frequencies are directly proportional to age; as age increases it also present san increase [7]. Majority of cholecystitis compose of cholesterol, calcium

carbonate, calcium bilirubin ate, otherwise it may be the combination of these three. Gallstones occur when the concentration of cholesterol surpassed, and it seized in mixed micelles chemical with phospholipids and bile acids [7]. The average age in this research of patients was (43.18 ± 13.970) years and that is similar with research of Nayal and his associates where the average age was (48.60 ± 11.50) years [9]. Our reported mean age factor was (43.18 ± 13.970) years. Whereas, the average serum values of calcium, HDL, LDL, TC and TG were respectively (11.550 ± 01.180), (40.21 ± 3.1), (137.98 ± 9.79), (204.27 ± 24.12) and (198.94 ± 72.12). The average value for every serum was measured while taking the unit value as Mg/dL. We also calculated average height (inches) and weight (kilograms) which was respectively (63.57 ± 4.14) inches and (54.30 ± 13.07) kilograms; whereas, Nagaraj and his associates find that Average serum Triglycerides (Mg/dL) was 144.19 ± 12.70, Total cholesterol (mg/dL) was 175.83 ± 12.68, HDL cholesterol (mg/dL) was 30.95 ± 4.42, LDL cholesterol (mg/dL) was 115.76 ± 12.01 in gallstone patients, his results are similar to our research results [10]. Devaki and his associates measured serum lipids in patients of cholelithiasis, total cholesterol and LDL coincide with the outcomes of our research respectively having an average value in Mg/dL as (224.3 ± 42.40) and (139.30 ± 23.80) [11]. According to the series of Al-Kataan MA, the mean and SD values for cholesterol, HDL, LDL and Tg were reported in mmol/L respectively as (6.39 ± 0.98), (0.91 ± 0.15), (4.66 ± 1.07) and (1.94 ± 0.58) [12]. In a research Méndez-Sánchez finds that total cholesterol was 5.3 ± 1.2 (mmol/L), HDL was 1.0 ± 0.3 (mmol/L), LDL was 3.3 ± 0.9 (mmol/L), and TG was 1.9 ± 0.9 [13]. Average serum calcium was as (11.55 ± 1.18 mg/dL) in the present research. In a research by Channa and his associates, average serum calcium was 13.1 ± 4.63 (Mg/dL) in patients of gallstones [14], which is similar to our research. In Kumari et. al., research Average serum calcium 2.10 ± 0.38 (mmol/L) [15], which is similar to our research.

CONCLUSION:

It is evident from the research outcomes that the gallstone disease incidence is more common among the female population than males. Females are more prone to disease onset than males and they are at an increased risk of gallstone. Various gallstones occurrences are also attributed to increased lipid and calcium serums; especially among females.

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