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A Study to Establish A Relationship Between the Chemical Composition of Gall Stone and its Complications, With Respect to Whr, Plasma Lipid Concentration, Population (Urban/Rural)

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ABSTRACT

Gallstones are common in surgical practice and our study has attempted to establish relationship between the chemical composition of gall stone and its complications, with respect to WHR, Plasma Lipid concentration, Population (urban/rural)

Gallstones are prevalent in females, with the highest incidence in their fourth and fifth decade, with almost pure cholesterol and mixed stones having a similar incidence rate.WHR and cholesterol levels, had a direct relationship with the type of stone, and people with abnormal WHR and dyslipidemia had developed pure cholesterol stones, and patients hailing from rural background had lesser incidence of pure cholesterol stones.

Patients with pure cholesterol stones were mostly symptomatic at the time of presentation, and they were more prone to develop gallstone induced pancreatitis and mirizzi's syndrome,and patients who had mixed stones presented with biliary colic.

In patients with mixed stones, they developed cholecystitis and omental adhesions secondary to bouts of cholecystitis.

KEYWORDS gallstones, waist hip ratio (WHR), plasma lipid concentration

AIMS AND OBJECTIVES OF THE STUDY:
To establish a relationship between the chemical composition of gall stone and its complications, with respect to WHR, Plasma Lipid concentration, Population (urban/rural)

Statistical methods applied
Descriptives
The Descriptives procedure displays univariate summary statistics for several variables in a single table and calculates standardized values (z scores). Variables can be ordered by the size of their means (in ascending or descending order), alphabetically, or by the order in which you select the variables (the default).

Contingency table analysis (Cross tabs)
The Crosstabs procedure forms two-way and multiway tables and provides a variety of tests and measures of association for two-way tables. The structure of the table and whether categories are ordered determine what test or measure to use. All the statistical calculations were done through SPSS for windows (v 16.0)

Source of data- Patients admitted as inpatients in the department of general surgery in a teaching medical college hospital during September 2012-october 2014 who have presented with symptoms suggestive of cholelithiasis and have been diagnosed ultrasonologically.

Sample size- With 14% of prevalence using standard formula, the proposed sample size for the study calculated was 225 using purposive sampling technique, who have been diagnosed to have cholelithiasis, and who underwent cholecystectomy.

Inclusion criteria Patients who are diagnosed to have cholelithiasis ultrasonologically

Exclusion criteria
Females who are pregnant.

Exclude female patients who are/were on OCPs.

Previously diagnosed with diseases like alcoholic liver disease, cirrhosis of liver .

Patients who are on treatment for dyslipidemia/diabetes mellitus.

Study design-Patients who have undergone cholecystectomy, the stones will be qualitatively analysed, and a relationship between the chemical composition of the stone, complications associated with each type of stone with the proposed risk factors will be established.

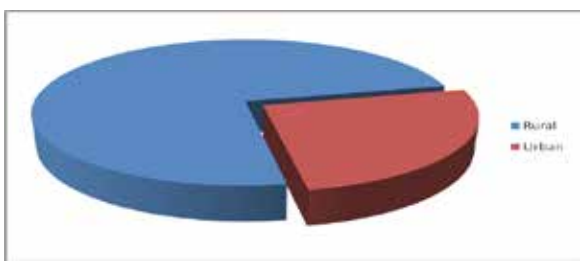
Method of collection of data- Patients who are admitted as inpatients in department of general surgery Teaching Medical College & Hospital, who have been diagnosed with gall stone disease ultrasonologically will be included in the study,

Pre-operative investigations and preparation of the patient for

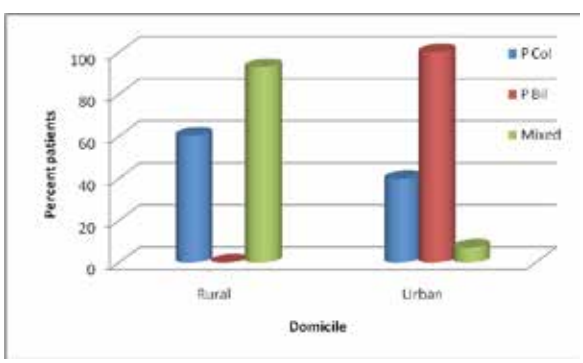
the procedure will be done as required and will be subjective, later the patients will be subjected to cholecystectomy, the gall stones obtained from the procedure will be taken and thoroughly washed with water to remove the excess bile on the stones and the stones will be later dried, and will be transported from the operation theatre to the site of qualitative analysis. The physical parameters of the calculi such as colour, number, shape, texture and cross section were noted. The size was determined by measuring the largest diameter of the solitary calculi and by deducing the average for the multiple stones. The chemical composition of the stones will be assessed by powdering the stone in a mortar, and were analysed by semi quantitative titre metric and colorimetric methods. Powdered stones were analysed for cholesterol, bilirubin, triglyceride, calcium and carbonate.

RESULTS

Distribution of patients with respect to domicile.



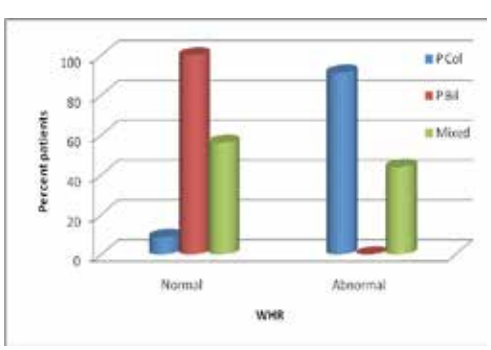
Distribution of chemical composition of gallstones with respect to domicile of the patients



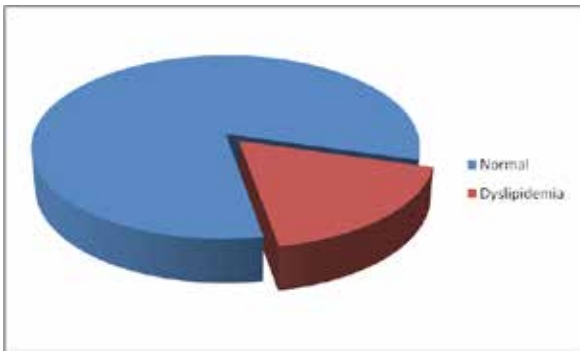
Distribution of patients in respect to WHR.

WHRWHR (Waist Hip Ratio)	Percent Age patients
Normal	29.8
Above Normal	70.2

HRti WWHR (Waist Hip Ratio)	P P.cholesterol (in %)	P.Bilirubin (in %)	Mixed stone (in %)
Normal	8.7	100	56.1
Above Normal	91.3	0	43.9

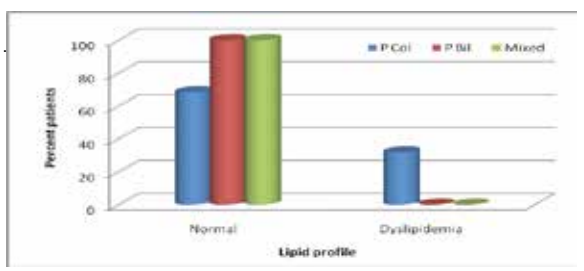


Distribution of patients with respect to cholesterol levels

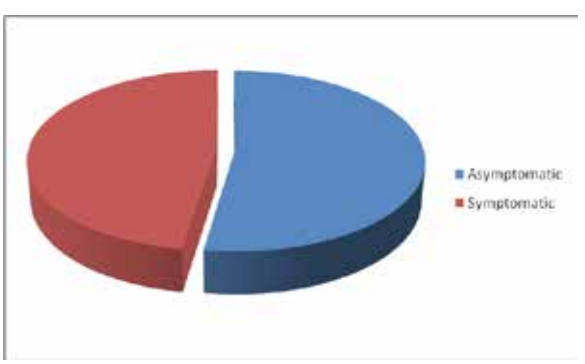


Distribution of chemical composition of gallstones with respect to cholesterol levels.

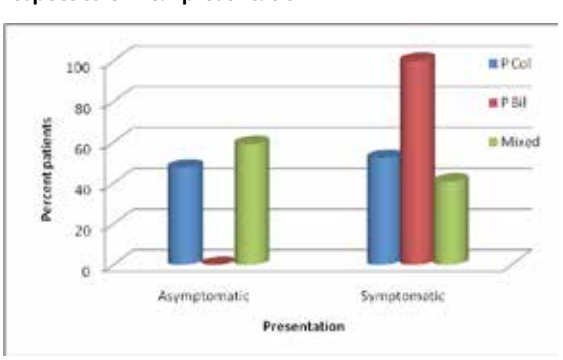
Cholesterol levels	P.cholesterol (in %)	P.Bilirubin (in %)	Mixed stone (in %)
Normal	68.3	100	100
Increased	31.7	0	0



Distribution of patients with respect to clinical presentation



Distribution of chemical composition of gallstones with respect to clinical presentation



DISCUSSION.

A Total of 225 patients were studied and of which there was a female predominance(126 vs 88).

Distributing the patients based on domicile showed that majority of patients were from rural background(74.2% vs 25.8%). When the domicile of the patient was compared to the chemical composition of the gallstones it showed that mixed stones were more common in rural people in comparison to the pure cholesterol and pure bilirubin stones at 92.9% vs 60.3%.In urban people pure cholesterol stones were seen in 39.7% and mixed stones in 7.1%.And the one patient who had pure bilirubin stones was a 12 year old boy who was suffering from haemolytic anemia. Of 225 patients studied when the WHR were measured it showed that majority of the patients had abnormal WHR (70.2% vs 29.8%).

Of the 225 patients studied when the chemical composition of the gallstones were compared with respect to WHR,it was seen that in patients with normal WHR the predominant stones were mixed stones(56.1 % vs 8.7%).And in the patients who had abnormal WHR pure cholesterol stones were more common in comparison with mixed stones.(91.3% vs 43.9%). When the patients were compared with respect to the total cholesterol levels, majority of the patients had a normal cholesterol level (82.2 % vs 17.8%). Of the 225 patients compared with the chemical composition of gallstones with respect to cholesterol levels, it was observed that in patients with Dyslipidemia pure cholesterol stones were the only stones. Whereas in patients with normal cholesterol levels, mixed stones were more common. Of the 225 patients studied, with respect to clinical presentation majority of the patients being asymptomatic (52.4% vs 47.6%). When the chemical composition of the gallstone were compared in respect to the clinical presentation,it was observed that in patients who were asymptomatic, and were diagnosed incidentally on an ultrasound of the abdomen,had a predominant mixed stones in comparison to pure cholesterol stones (59.2 % vs 47.6 %).

In patients who were symptomatic at the time of presentation,they were predominantly pure cholesterol stones in comparison to mixed stones (52.4 % vs 40.8 %). In patients who were symptomatic,biliary colic was the most common complaint and when the chemical composition of the gallstone was assessed, it was seen that, there was a slight predominance of pure cholesterol stones to mixed stones(41.3% vs 39.8%).

When the chemical composition of the gallstones were compared to the complications the patients had in the peri-operative period,it was seen that 37.8 % patients with mixed stones and 24.7 % patients with pure cholesterol stones,had developed complications.

CONCLUSIONS.

Of the patients studied there was a definite female predominance.

This disease was more common in their fourth and fifth decades in both the genders.

Classification of the patients based on domicile showed that majority of patients were from rural background, maybe because of the demography of the hospital itself which caters to rural population primarily.

When the it was compared to the chemical composition of the gallstones it showed that mixed stones were more common in rural people in comparison to the pure cholesterol and pure bilirubin stones, this can be attributed to the more traditional diet of rural people in comparison with urban population, whose diet is predominantly low in fibre.

When the WHR was assessed, majority of the patients had abnormal values, and there was a high percentage of it among urban population, and patients with abnormal WHR, had developed pure cholesterol stones in contrast to mixed stones in patients with normal WHR. which proves the relationship between WHR and the risk of developing pure cholesterol stones.

When the cholesterol levels were estimated majority of the patients had fallen in the normal range, though majority of the patients had abnormal WHR, it was not reflected in the cholesterol levels and when the chemical composition of gallstones was assessed it was observed that in patients with Dyslipidemia pure cholesterol stones were the only stones, whereas in patients with normal cholesterol levels, mixed stones were more common. This shows that there is a direct relationship with the chemical composition of gallstones, with cholesterol levels and WHR of the patients. Though the patients with abnormal WHR were not dyslipidemic, but were at definite risk of developing it at a later stage.

Majority of the patients were asymptomatic, and the patients who were symptomatic had pure cholesterol stones.

And in patients who had developed jaundice secondary to cholecystitis or even CBD obstruction, the patient had mixed stones.

And the patients who had developed pancreatitis, it was more common in patients with pure cholesterol stones.

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