

ORIGINAL ARTICLE

Evaluation of Different Types of Gallstones Extracted by Endoscopic Retrograde CholangiopancreatographyMUHAMMAD AYUB NAICH¹, SAGHEER HUSSAIN², ADEEL QAMAR³, HINA ZAMIR⁴, ZIA UL MUSTAFA⁵, FATIMA CHEEMA⁶¹Assistant professor gastroenterology, Sir Ganga Ram Hospital, Lahore²Consultant Gastroenterologist DHQ Hospital, Sheikhpura³Assistant Professor Gastroenterology, Sahara Medical College, Narowal⁴Assistant Professor Medicine, Sir Ganga Ram Hospital Lahore⁵Associate Professor of Medicine, Sahara Medical College, Narowal⁶Registrar Gastroenterology, Sir Ganga Ram Hospital, LahoreCorrespondence to: Muhammad Ayub Naich, Email: mnaich@hotmail.com, Cell: 03324662546**ABSTRACT****Objective:** To study frequency of various types of gall stones extracted from bile duct using ERCP**Study design:** This is a cross sectional study**Study place and duration:** Study was conducted in the department of Gastroenterology Sir Ganga Ram Hospital Lahore. Study was completed in six months duration from January 2022 to June 2022.**Materials and methods:** Diagnosed cases of bile duct stones were underwent ERCP and extracted stones were analyzed to determine their composition. Ages of the patients were 20-70 years. Cases of either gender irrespective of residential area were included in this study. Patients with ischemic heart disease, asthma, liver cirrhosis, malignancy, tuberculosis, chronic obstructive pulmonary disease, interstitial lung disease and pregnancy were excluded from the study. During ERCP gross findings of the stones were noted.**Results:** Total 140 cases were studied having bile duct stones including 55(39.3%) male and 85(60.7%) females. There were 80(57%) cases with the age \leq 50 years and 60(42.9%) cases above 50 years. Mean age of the patients was 46 ± 4.72 years. 58(41.4%) cases were from rural area and 82(58.6%) from urban area. Diabetes, hypertension and obesity was found in 38(27%), 47(33.6%) and 49(35%) cases respectively. Cholesterol stones were found in 51(36.4%), mixed stones in 70(50%) and brown pigmented stones in 19(13.6%) cases.**Conclusion:** Mixed cholesterol gall stones were most commonly found followed by pure cholesterol and brown pigmented stones.**Keywords:** Gallstones, Bile duct stones, ERCP, Endoscopy, Cholesterol stones,**INTRODUCTION**

Bile duct stones is a very common disease in Asian population.¹ It is very necessary to know pathophysiology of bile duct stones formation and its composition to manage it properly. If we know its composition we can prevent the disease and its complications.² On the bases of chemical composition gallstones are divided into three main types as pure cholesterol stones, mixed cholesterol and brown pigmented stones.³ Majority of the patients have cholesterol stones composed of cholesterol monohydrate crystals, precipitates of calcium bilirubinate, with calcium phosphate and calcium sulphate.⁴ Mixed stones contain 50% cholesterol by weight. Pure cholesterol crystals looks yellow and nodular.⁵ Gall stones are classified by their location as well like Intrahepatic and bile duct stones. Intrahepatic stones are usually brown pigmented stones while gall bladder stones are mainly cholesterol stones and less commonly pigmented stones.⁶ Mixed cholesterol stones are mostly found in the bile duct. Patients with bile duct stones usually present with biliary colic, cholangitis, obstructive jaundice and pancreatitis. Imaging techniques used for this disease are trans-abdominal ultrasound, ERCP and MRCP.⁷ ERCP is a procedure of choice for extracting bile duct stones. Bile duct stones may come from gall bladder or may develop primarily in the bile duct.⁸ Stones coming from gall bladder into the bile duct are called secondary stones which are cholesterol stones mostly. Gall bladder stones developing due to hemolysis are black pigmented type that don't travel to bile duct usually.⁹ Primary bile duct stones are pigmented and develop due to bile stasis and recurrent infections.¹⁰ This study has been conducted to document our experience about various types of gallstones extracted by ERCP in our population to provide necessary data about the frequency of choledocholithiasis and its etiological causes. It will help to anticipate the magnitude of problem in our patients and manage them properly. Data of gallstones composition will help us to prevent the disease more effectively and in a targeted way by avoiding etiological factors.

MATERIALS AND METHODS

This is a cross sectional study conducted in the department of Gastroenterology Sir Ganga Ram Hospital Lahore. Study sample was calculated using WHO sample size calculator ($n=140$). Convenient sampling technique was used for sample selection. Study was completed in six months duration from January 2022 to June 2022. Diagnosed cases of bile duct stones were underwent ERCP and frequency of various types of extracted stones was determined on the basis of their composition. Stones were sent to the institutional laboratory for stone analysis. Ages of the patients were 20-70 years. Cases of either gender irrespective of residential area were included in this study. Patients with ischemic heart disease, asthma, liver cirrhosis, malignancy, tuberculosis, chronic obstructive pulmonary disease, interstitial lung disease and pregnancy were excluded from the study. During ERCP gross findings of the stones were noted. Ethical approval taken from the institutional review board. Written informed consent was taken from all the study cases. Data was collected and documented on a proforma. SPSS software (version-20) was used for data analysis. P-value less than 0.05 was considered statistically significant.

RESULTS

Total 140 cases were included in the study having bile duct stones. There were 55(39.3%) male and 85(60.7%) female cases. There were 80(57%) cases with the age \leq 50 years and 60(42.9%) cases above 50 years with mean age of the patients 46 ± 4.72 years. 58(41.4%) cases were from rural area and 82(58.6%) from urban area. Diabetes, hypertension and obesity was found in 38(27%), 47(33.6%) and 49(35%) cases respectively. Cholesterol stones were found in 51(36.4%), mixed stones in 70(50%) and brown pigmented stones in 19(13.6%) cases.

Gallstones were more common among females than males. Out of 38 diabetic patients majority of the patients (55.2%) had mixed stones. Similarly out of 47 hypertensive patients and 49 obese patients had 59.6% and 51% had mixed cholesterol stones. In our study 80(57%) cases had single bile duct stone while 60(43%) cases had multiple bile duct stones.

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Table-I: Frequency of gallstones with respect to different study parameters (n=140)

Study Parameters		Types of Stones			p-value
		Cholesterol stones (n=51)	Mixed stones (n=70)	Brown pigmented stones (n=19)	
Gender	Male (n=55)	21	29	05	0.326
	Female (n=85)	30	41	14	
Age (years)	≤50 y (n=80)	30	40	10	0.083
	>50 y (n=60)	21	30	09	
Residential area	Rural (n=58)	15	33	10	0.032
	Urban (n=82)	36	37	09	
Diabetes	Yes (n=38)	08	21	9	0.536
	No (n=102)	43	49	10	
Hypertension	Yes (n=47)	12	28	7	0.026
	No (n=93)	39	42	12	
Obesity	Yes (n=49)	17	24	8	0.051
	No (n=91)	34	46	11	

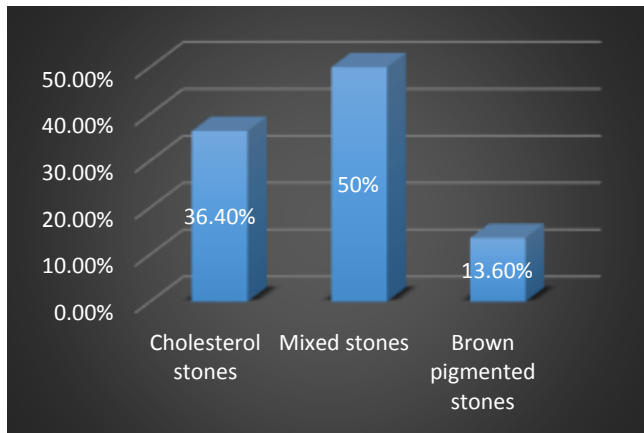


Figure-I: Frequency of various stones in the study group (n=140)

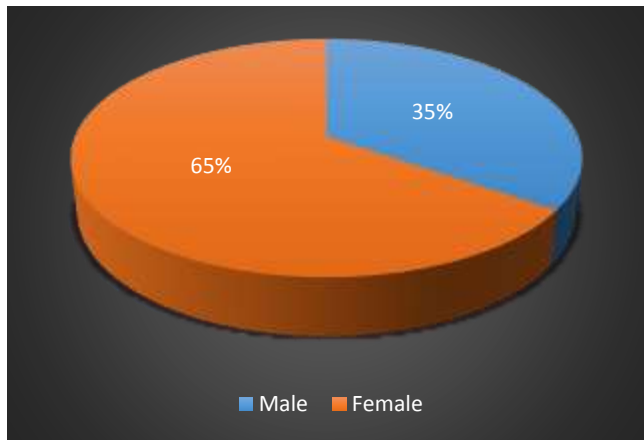


Figure-II: Gender based distribution of the study cases (n=140)

DISCUSSION

Gall stones obstructing bile duct are major indication for endoscopic retrograde cholangiopancreatography (ERCP) with minimum complications, less morbidity and having significant positive impact on the patient life.¹¹ In the recent decade significant development has occurred in the management of biliary diseases.¹² In our study 140 cases were included with bile duct

stones including 55(39.3%) male and 85(60.7%) female cases. There were 80(57%) cases with the age ≤50 years and 60(42.9%) cases above 50 years with mean age of the patients 46 ± 4.72 years. 58(41.4%) cases were from rural area and 82(58.6%) from urban area. Cholesterol stones were found in 51(36.4%), mixed stones in 70(50%) and brown pigmented stones in 19(13.6%) cases. Akram et al reported 62% female cases with bile duct stones.¹³ Hassan et al has also reported majority of female cases in the study group as 70 having bile duct stones.¹⁴ Hameed et al reported gallstones obstructing bile duct in majority of female cases with the frequency of 73%.¹⁵ These results are similar to our findings. A study conducted in Singapore by Bhavesh et al stated that bile duct stones are more common among female population having frequency of 55%.¹⁶ In contrary to above results a previous study conducted in China reported bile duct stones more common among male cases.¹⁷ A recent study by Wang et al reported mean age of the study cases as 45.78 ± 11.4 years with the range of ages as 30-70 years.¹⁸ A study conducted in Brazil found mean age of the cases as 48.73 ± 11.87 years having bile duct stone disease. In our study diabetes, hypertension and obesity was found in 38(27%), 47(33.6%) and 49(35%) cases respectively. Mariana et al conducted a study in Italy, reported 10% patients with diabetes mellitus and 30% cases with hypertension.¹⁹ However in our study frequency of diabetes mellitus was higher. In our study 80(57%) cases had single bile duct stone while 60(43%) cases had multiple stones. According to a study done by Qayed et al single bile duct stone was found in 60% cases, their results were similar to our study results. In our study mixed cholesterol stones were more commonly found which indicate early management of high cholesterol level in our population to reduce the prevalence of the disease.

CONCLUSION

In our study mixed cholesterol stones were high in frequency followed by pure cholesterol stones and pigmented stones. High prevalence of the bile duct stones was associated with rural residential status, diabetes mellitus, obesity and hypertension and female gender.

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