

Determinants of Gallstones Among all Adult Male and Female Patients Above 30 Years of Age at Sir Ganga Ram Hospital, Lahore

Ayesha Ahmed^{1*}, Muhammad Arif Khan¹, Qurat-ul-ain Ali¹, Zeenat Islam¹,
Ayesha Kaleem¹

¹University Institute of Diet and Nutritional Sciences, Faculty of Allied Health Sciences,
University of Lahore, Lahore, Pakistan

*aaaband3@yahoo.com

Abstract:

Gallstones incidence is increasing day by day. In under developing countries the prevalence is low but in well developed countries the gallstones is about 24%.

Objective:

To find out the determinants of gallstones among adult male and female patients above 30 years of age at Sir Ganga Ram Hospital, Lahore.

Methods:

A cross-sectional study was conducted at Sir Ganga Ram Hospital, Lahore. 100 adult males and females aged above 30 years were selected through non-probability convenient sampling technique. Data were collected through pre-tested questionnaire. All the adult male and female patients of gallstones above 30 years old from both indoor and outdoor department of medical, surgical units were included. The data were analyzed by SPSS version 21.0.

Results:

Among the participants, 86% were females and 14% were males. 43% females had gallstones at the age of 31-45 years while 42.9% males had gallstones at this age. 26% males and females had 4 children that mean increased fertility. 40% males and females had normal Body Mass Index (BMI).

Conclusions:

Female gender, increasing age and fertility were found to be associated in the formation of gallstones while there is no association with increased Body Mass Index (BMI).

Key words:

Gallstones, Age, Female, Fertile, Fat, Fair.

Introduction:

The formation of stones in the absence of

infection in the gallbladder is called gallstone.¹ Gallstones are silent and are noticed only upon assessment for other disease. Disease affects when gallstones induce obstruction or inflammation of the gallbladder or biliary tree.² In the gallbladder, bile is concentrated by absorption of its water content by the absorptive cell of gallbladder mucosa. If the cholesterol comes out of solution, it forms crystal, along with the bilirubin pigment and calcium in the bile then it form stones. The stones greatly vary in number, size and color.³ Numbers of factors put people at higher risk those who are fat: BMI >30, female, fertile, forty: age >40 and fair.⁴ Female gender and higher BMI (body mass index) had major role in the formation of gallstones.⁵ Growing age maybe a risk factor for all gallstones formation as 20% of adults over 40 and 30% over age 70 developed gallstones.⁴ Women during fertile years are more prone to experience gallstones than men. Evaluated degrees of the hormone estrogen, as a result of being pregnant or hormone remedy, or the usage of mixed (estrogen-containing) kinds of hormonal birth control, can also evaluate the levels of cholesterol in bile and additionally decrease gallbladder motion, resulting in gallstone formation. Ladies with a frame mass index of over 30 within the obese range have twice the danger of gallstone ailment as compared to ladies who are not overweight; it raises the danger of LDL cholesterol gallstones via increasing biliary secretion of cholesterol, and creates stones. Women who are obese are more prone of having gallstones disease than men.⁴ High body mass index (BMI) and high waist hip ratio are the most dominant factor in the gallstones formation.⁶ In Pakistani population the prevalence of

gallstones is increasing. In under developing countries the prevalence is low but in well developed countries the gallstones is about 24%.⁴ The prevalence rates in adult Europeans is 10–15%, while in African and Asian population's prevalence is 3–5 %. In the United States, the prevalence rates range from 5% to 27%.⁷ A study was performed by Volzke H *et al.*, 2005 that gender-specific risk factor have high influence in the formation of gallstones in the population. The study was inspected by using data of the population-based Study of Health in Pomerania (SHIP). 4202 persons aged 20–79 years were observed. The results indicate that 11.1% with pervious cholecystectomy, 10.1% having gallstone and women have twofold higher risk than men. Age, BMI and low serum HDL cholesterol level together link with gallstone formation. According to the conclusion the female gender, age and overweight are major risk factor for the gallstones formation.⁸ A study was conducted by Dittrick GW *et al.*, 2005 on gallstone pathology in morbid obesity. As obese patient were at higher risk of gallstone formation. They compared two groups one is obese with gallstone with non-obese control group. 478 of people were examined the result indicate that obese patients are at increased level of benign gallbladder ailment than a group of controls, and the relative danger seems to be definitely associated with the extent of increase in the BMI. Obesity appeared to trade the result of age and gender on gallbladder pathology.⁹ A study was conducted by Kharga B *et al.*, 2016 to establish a relationship between increasing BMI and risk of cholelithiasis. Ten years data of 7182 patients were collected, patient with cholelithiasis was one group and other diseased patients were second group. The result indicated that majority of gallstones were females with the mean age of 37.09 years and BMI was 23.55kg/m². The researcher concluded that not only the overweight or obese patients develop cholelithiasis but also the individuals with normal BMI.¹⁰ A study was performed by

Pagliarulo M *et al.*, 2004, to discover the prevalence and possible risk factors of gallstones disease in diabetes. 1337 patients were studied of whom 92% were type 2 and 8% were type 1 diabetes mellitus patients. The outcomes of the study showed that prevalence of gallstones disease were higher in diabetes than normal. 261 have stones and 71 have gone through the cholecystectomy after a diagnosis of diabetes. The effect showed that gallstones were not suggestively related to the type of diabetes , plasma amount or HDL cholesterol, triglyceride levels, alcoholic beverage intake, smoking use, physical activity, oral birth control pills or menopause in fact increasing age, higher BMI and family account of gallstones have significant influence. The result suggested that type 1 and 2 diabetes, the prevalence of gallstones was effectively related to age, BMI and family history.¹¹ A study was conducted by Palermo M *et al.*, 2013, to find the prevalence of cholelithiasis in Buenos Aires. Cross-sectional, descriptive and observational study was performed in the tertiary care hospital. Out of 1875 individual, 866 were males and 1009 were females older than 20 years old. The result indicated that the prevalence of cholelithiasis in Buenos Aires was 21.9%. A major link was found between cholelithiasis and female gender, age, BMI, history of colic pain, family history of cholelithiasis, smoking, fatty liver and number of pregnancies.¹² A study was performed by Shabanzadeh DM *et al.*, 2016, on the determinants of gallstones formation in a Danish cohort and cohort study was used in this research. The information becomes gathered via ultrasound. BMI, blood pressure, life-style, blood lipids and female sex hormones had been measured. The results indicated that overall increasing incidence of gallstones was 0.60%. The major links for occurrence of gallstones were age, female sex and BMI and non-HDL cholesterol. No links become located with the blood pressure, smoking, alcohol consumption, HDL cholesterol or triglycerides in meta-

evaluation. Existence gallstones and metabolic syndrome share mutual risk element.¹³ A study was performed by Bass G *et al.*, 2013, on the 5Fs are the reminder of Cholelithiasis and its time to add family history. The patient with upper abdominal pain and a profile of fair, fat, female, fertile and forty have Cholelithiasis, so the family history was overlooked and should be familiarized. 2 groups were assessing one have Cholelithiasis and other was control group. The result indicate that 398 patients were assessed , more were women 75.8% vs. 55.5%, fair 62.9% vs. 32.1%, fertile 68.2% vs. 25%, BMI 28.3% vs. 9.5% and aged 40 were 41.4% vs. 38.5%. In Cholelithiasis 39.4% have family history and 13.5 % of control. The study indicated that 5Fs reminder retain a role in clinical diagnosis of patients supposed of Cholelithiasis but Familial should be introduced instead of Forty.¹⁴ Current study aimed that how preventive measures could be adopted to avoid the development of gallstones.

Methods:

This was a cross-sectional study with the sample size of 100, conducted at Sir Ganga Ram Hospital, Lahore. 4 months from April to July 2017 was the duration of the study. Non probability convenient sampling technique was used. All patients form Sir Ganga Ram Hospital and Mayo Hospital, Lahore and both indoor and outdoor patients were taken. All the adult male and female patients of gallstones above 30 years were included. All non-cooperative patients and patients from other hospital were excluded. The pre-tested questionnaire was used to collect data, while Microsoft excel and SPSS Version 21 were used to analyze the data.

Results:

A total number of 100 males and females were taken in this study. 86% were females and 14% were males. Out of 14, 21.4 % males belonged to 15-30 years of age, 42.9 % males belonged to 31-45 years of age, 14.3% males belonged to 46-60 years of age and 21.4% males belonged to 61-80

years of age while 12.8% females belonged to 15-30 years of age, 43% females belonged to 31-45 years of age, 30.2% females belonged to 46-60 years of age and 14% females belonged to 61-80 years of age out of total 86 females as shown in table 1. 43% males and females were 31-45 years of age, as shown in Table 1.

Gender	Age (Years)				Total
	15-30	31-45	46-60	61-80	
Male	3(21.4%)	6(42.9%)	2(14.3%)	3(21.4%)	14
Female	11(12.8%)	37(43%)	26(30.2%)	12(14%)	86
Total	14(14%)	43(43%)	28(28%)	15(15%)	100

Table 1: Distribution of gender and age among patients

Out of 14, 21.4% of males belonged to 17-18.5 underweight, 57.1% of males belonged to 18.5-24 normal weight and 21.4% males belonged to 25-30 overweight while out of 86, 37.2% of females belonged to 18.5-24 normal weight, 37.2% of females belonged to overweight and 25.6% females belonged to 25-30 overweight as shown in table 2. 40% males and females had normal weight, as shown in Table 2.

Gender	Body Mass Index (BMI)				Total
	17-18.5 Underweight	18.5-24 Normal	25-30 Overweith	Greater than 30 Obese	
Male	3 (21.4%)	8 (57.1%)	3 (21.4%)	0 (0%)	14
Female	0 (0%)	32 (37.2%)	32 (37.2%)	22 (25.6%)	86
Total	3 (3%)	40 (40%)	35 (35%)	22 (22%)	100

Table 2: Distribution of gender and BMI among patients

28.6% males were unmarried and 71.4% males were married while 9.3% females were unmarried and 90.7% females were married. 88% males and females were married as shown in Table 3.

Gender	Marital Status		Total
	Unmarried	Married	
Male	4 (28.6%)	10 (71.4%)	14
Female	8 (9.3%)	78 (90.7%)	86
Total	12 (12%)	88 (88%)	100

Table 3: Distribution of gender & marital status

28.6% of males had none children, 14.3% had 1 children, 21.3% had 3 children, 28.6% had 4 children and 7.1% had more than 4 children while 11.6% of females had none children, 14% had 1 children, 7% had 2 children, 23.3% had 3 children, 25.6% had 4 children and 18.6% had more than 4 children. 26% males and females had 4 children as shown in Table 4.

Gender	No. of children						Total
	None	1	2	3	4	More than 4	
Male	4(28.6%)	2(14.3%)	0(0%)	3(21.4%)	4(28.6%)	1(7.1%)	14
Female	10(11.6%)	12(14%)	6(7%)	20(23.3%)	22(25.6%)	16(18.6%)	86
Total	14(14%)	14(14%)	6(6%)	23(23%)	26(26%)	17(17%)	100

Table 4: Distribution of gender and parity

43% males and females were at the age of 31-45 years, 40 % males and females had normal BMI and 26% males and females had 4 children and no males and females were not having fair skin color as shown in Figure 1.

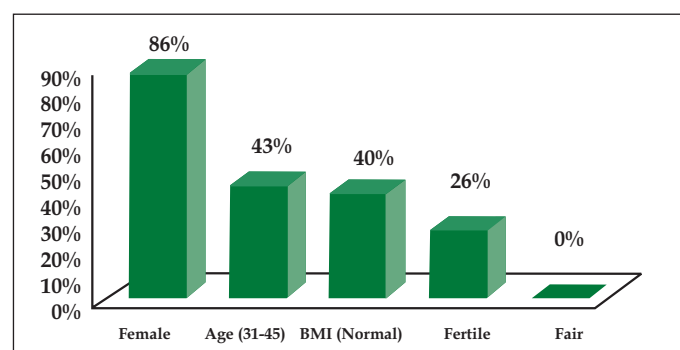


Figure 1: Determinants of Gallstones.

Discussion:

Findings of the current study, increasing age of female had greater impact in the formation of gallstones as compared to males. 43% females had gallstones at the age of 31-45 while 42.9% males had gallstones at the age of 31-45, results are in accordance with, Völzke H *et al.*, 2005 who conducted a study, on the gender-specific risk factor in the formation of gallstones and result concluded that increasing age, female gender and overweight had greater chances of developing gallstones.⁸ Findings revealed that

40% males and females had normal BMI similarly a study was conducted by Kharga B *et al.*, 2016, which stated that not only the overweight or obese patients developed gallstones but also the individual with normal BMI developed gallstones.¹⁰ While a study performed by Dittrick G W *et al.*, 2005, stated that obese patients were at the increased level of gallbladder disease which did not supports the finding of the current study.⁹ According to the current study 26% males and females had 4 children that means increased fertility similarly a study was conducted by Bass G *et al.*, 2013 in which 68.2% fertile males and females were found, which supported the above study.¹⁴

Conclusions:

The current study concluded that the risk of developing gallstones were more among females as compared to males. Among married females, age above 30 years and increase in fertility cases were the most common causes of occurrence of gallstones. Uneducated individuals and who were not having fair skin were at more risk of development of gallstones.

References:

- 1- Carol D, Rachel K, Mahan LK. Escott Stump S. Krause's food & nutrition therapy. 2008; 12e:728.
- 2- Humes HD, editor. Kelley's essentials of internal medicine. Lippincott Williams & Wilkins;2001. 2e;226.
- 3- Loeffler AG, Hart MN. Introduction to human disease: Pathophysiology for health professionals. Jones & Bartlett Publishers; 2014 Jan 6e;228.
- 4- Saqib A, Shaikh SS, Sodhar JM. Gall stones; frequencies of gall stones in the patients attending surgical OPD at ISRA Hospital Hyderabad. Professional Medical Journal. 2014 Apr 1;21(2).
- 5- Schafmayer C, Hartleb J, Tepel J, Albers S, Freitag S, Völzke H, Buch S, Seeger M, Timm B, Kremer B, Fölsch UR. Predictors of gallstone composition in 1025 symptomatic

- gallstones from Northern Germany. *BMC gastroenterology*. 2006 Dec;6(1):36.
- 6- Shaffer EA. Epidemiology of gallbladder stone disease. *Best Practice & Research Clinical Gastroenterology*. 2006 Jan 1;20(6):981-96.
 - 7- Njeze GE. Gallstones. *Nigerian Journal of Surgery*. 2013;19(2):49-55.
 - 8- Völzke H, Baumeister SE, Alte D, Hoffmann W, Schwahn C, Simon P, John U, Lerch MM. Independent risk factors for gallstone formation in a region with high cholelithiasis prevalence. *Digestion*. 2005;71(2):97-105.
 - 9- Dittrick GW, Thompson JS, Campos D, Bremers D, Sudan D. Gallbladder pathology in morbid obesity. *Obesity surgery*. 2005 Feb 1;15(2):238-42.
 - 10- Kharga B, Sharma BK, Singh VK, Nishant K, Bhutia P, Tamang R, Jain N. Obesity not necessary, risk of symptomatic cholelithiasis increases as a function of BMI. *Journal of clinical and diagnostic research: JCDR*. 2016 Oct;10(10):PC28.
 - 11- Pagliarulo M, Fornari F, Fraquelli M, Zoli M, Giangregorio F, Grigolon A, Peracchi M, Conte D. Gallstone disease and related risk factors in a large cohort of diabetic patients. *Digestive and liver disease*. 2004 Feb 1;36(2):130-4.
 - 12- Palermo M, Berkowski DE, Córdoba JP, Verde JM, Giménez ME. Prevalence of cholelithiasis in Buenos Aires, Argentina. *Acta Gastroenterológica Latinoamericana*. 2013;43(2).
 - 13- Shabanzadeh DM, Sørensen LT, Jørgensen T. Determinants for gallstone formation—a new data cohort study and a systematic review with meta-analysis. *Scandinavian journal of gastroenterology*. 2016 Oct 2;51(10):1239-48.
 - 14- Bass G, Gilani SN, Walsh TN. Validating the 5Fs mnemonic for cholelithiasis: time to include family history. *Postgraduate medical journal*. 2013 Aug 9;postgradmedj-2012.