Relationship of BMI and Age With Cholelithiasis

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ABSTRACT

Objective — *To find out relationship of BMI and age of patients with gallstones.*

Study design — *Cross sectional study.*

Place & Duration of study — *Department of Surgery ward 3, Jinnah Postgraduate Medical Centre Karachi, from November 2015 to November 2016.*

Methodology — *Patients admitted with the diagnosis of cholelithiasis without any complications were included. Data were recorded on a form. Variables recorded included age, gender and body mass index (BMI) of the patients. SPSS version 22 was used for data entry and analysis.*

Results — *A total of 134 patients were included in the study. Females were more (n=110 - 82.1%) as compared to males (n=24 - 17.9%). Age varied from 17 year to 65 year with a mean age of 42 year. Majority (n=94 - 70%) of patients were above 35 years of age. Most (n=74 - 52%) patients were in healthy group according to the BMI classification. Over weight and obese patients were only 52 (38%). Twelve patients with gallstones were underweight and all of them were females.*

Conclusion — *Increased frequency of cholelithiasis was found in younger population with normal BMI and even in patients with below normal BMI.*

Key words — *Cholelithiasis, BMI, Age.*

INTRODUCTION:

Gallstone is a common problem affecting the adult population. Prevalence of the disease varies according to the geographic distribution ranging from 64.1% of women and 29.5% of men in north American Indians to less than 5% in black Africans.[1] Prevalence of this condition is low in Asian population including Pakistan, with a female to male ratio of 3:1.[2] The presence of gallstones increases with the age and about 20% of adults over 40 years and 30% of adults over 70 years have gallstones.[3] It is observed that hypomotility of gallbladder is a contributing factor in stone formation.[4]

The well known risk factors for the development of gallstones are age, gender, obesity, family history and fertility.[5] In addition other risk factors also play important role. This includes rapid weight loss, parenteral nutrition, ileal resection or bypass and diabetes mellitus.[6] Prevention with the help of medication remain unproven except for ursodeoxycholic acid. Main emphasis is on identification of modifiable risk factors and alteration to decrease the formation of gallstones.[7]

Body fatness has been considered as an important risk factor for the development of chlolelithiasis along with other medical conditions relating to this. Body fatness can be assessed by a number of different ways and BMI is one of them. It has been observed that young and lean patients also present with

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cholelithiasis in our clinical practice.

METHODOLOGY:

This was a cross sectional study conducted in the Department of Surgery ward 3, Jinnah Postgraduate Medical Centre Karachi, from November 2015 to November 2016. All patients admitted during study period with diagnosis of cholelithiasis without complications were included. Patients with history of previous abdominal surgery were excluded. Variables noted were age, gender, BMI, ultrasound findings, and number of stones either single or multiple. Patients younger than 20 year of age were also inquired and investgated for any haemolytic diseaes. All patients underwent laparoscopic cholecystectomy. Data was analyzed by using SPSS 22 version.

RESULTS:

A total of 134 patients were included in the study. Female were more (*n=110* - 82.1%) as compared to male (*n=24* - 17.9%). Age varied from 17 year to 65 year with a mean of 42 year. Majority (*n=94 - 70%)* of patients were above 35 year of age. Most of the patients were in healthy group (*n=70* - 52%) according to the BMI classification. Over weight and obese patients were only *52 (*38%) (table I, II, III). The complete blood count (CBC) and liver function tests were found to be within normal limits. One patient of 16 year of age had hemolytic disease and was excluded from the study. Most of the patients presented with multiple stones and single stone was present in only *12 (*9%) patients.

DISCUSSION:

Gallstones has become increasingly common and observed in all age groups and the incidence increases with age. Gallstones mostly remain asymptomatic. Symptoms usually appear within 5 to 20 years of diagnosis.[8] In this study female to male ratio was 4.5:1. Similar findings were documented in another study.[9] Incidence of cholelithiasis is high in female as described in most of the studies but the ratio was bit low, 3:1.[3] There is well known saying about cholelithiasis being common in female who are fertile, around forty year of age and obese. Sex hormones are responsible for more prevalence in female patients.[10]

In this study the mean age was 42.34 year. With the age the incidence of gallstones increases. In this study patients of younger age group were diagnosed with cholelithiasis. Out of 134 patients, eight patients were below 20 years of age. Similar findings were noted in another study from Pakistan with 11% of study population younger than 25 years.[9]

Table I: Characteristics of Patients

	Mean	N	Std. Deviation	Minimum	Maximum
Age	42.34	134	12.138	17	65
BMI					
Female	24.0941	110	4.47437	16.40	35.00
Male	26.8688	24	3.54099	21.45	32.81
Total	24.5910	134	4.44028	16.40	35.00

Table II: Age and BMI Categories

Age (Year)	Under Weight	Healthy	Obese	Over Weight	Total (n)
Below 20	6	2	0	0	8
20-35	1	17	6	8	32
Above 35	5	51	8	30	94

Table III: Gender and BMI categories

		BMI Categories				Total
		Under Weight	Healthy	Obese	Over Weight	
Gender	Female	12	61	11	26	110
	Male	0	9	3	12	24
	Total	12	70	14	38	134

Another study with a larger sample size (n=2066) conducted in Hyderabad also showed that the more younger patients presented with cholelithiasis in Pakistan as compared to the western countries.[11]

BMI has a well known association with cholelithiasis in women but this association was not found in men.[12-15] One study showed association of BMI and waist to hip ratio indicating obesity association in men.[16] The mean of BMI in our study was 24.59+4.44 which is comparable with other studies like a study conducted in India with the mean of BMI 23.3+4.84.[12] Females having the lower mean value of BMI as compared to the male and probable explanation is that the female sex hormones also involved in development of gallstones. Similar findings were observed in another study with a sample size of over 11000.[17] BMI grouping in accordance with WHO criteria showed that most of the patients with cholelithiasis were from the underweight and normal weight group (61%). All the underweight patients (n=12) were females and among them six were below the age of 20 years. Most of the studies done previously showed association of rising BMI with the development of gallstones and limited work was found to look into the reason of gallstone in patients with normal BMI. A community based study conducted in India failed to show an association of BMI with cholelithiasis.[18] Factors associated with gallstones may include change in life style and dietary pattern. This is an important area for future research.

CONCLUSIONS:

Frequency of cholelithiasis was found more in younger age group patients with normal BMI. Patients with below normal BMI also developed gallstones.

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Muhammad Mansoor Iqbal	Data analysis, introduction, discussion
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Shah Hassan Shah	Data collection, reference
Sughra Parveen	Review, introduction

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