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Association of Cholelithiasis with Junk Food & Lipid Profile in Young Women

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ABSTRACT

Introduction: Cholelithiasis is a disease which is becoming quite prevalent in the society. Recent years have seen a dramatic change in the population afflicted by this disease along with its presentation. Changes in dietary habits with westernization of diet, sedentary life style and craving for fast food have resulted in a large number of female population belonging to younger age group (20-40 years) affected by gallstones. **Objectives:** To define the prevalence of gall stone disease in young female population, to highlight the importance of dietary factors and to define the role of lipid abnormalities. **Study Design:** Cross -sectional study. **Place and Duration of Study:** Surgical department of Allied Hospital, Faisalabad Medical University (FMU), Faisalabad from 20-6-17 to 20-10-17. **Materials &Methods:** A total of 50 patients and 30 controls were included in the study. Data was collected by a literature-based questionnaire regarding type of diet. Serum cholesterol & triglycerides were assayed by kit method. Abdominal ultrasonography was performed. The data obtained was subjected to statistical analysis using a SPSS version 17. **Results:** Results showed mean value for age 35.01 ± 5.437 standard deviation. Out of 50 patients, 19 females were in the range of 25-35years (38.0 %) and 31 were in 36-45 years of age (62.0 %). Out of 50 patients 16(32%) gave history of eating fast & fried food whereas 34(68%) patients never had taken any such food. Patients consuming soft drinks were 28(56%) & non-consumer patients were 22(44%).Patients having increased cholesterol were 7(14%).Normal level was observed in 43(86%) patients. Increased triglyceride level was found in 28(56%) while normal level in 22(44%) patients. **Conclusion:** The results indicated that the incidence of gallstones is increasing in younger females even up to 25 years. There is strong association of the disease with increasing age and junk food. No association was found with soft drink consumption. Also, no correlation was found with increased cholesterol & triglycerides.

Keywords: Cholelithiasis, junk food, cholesterol and pigment stones.

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INTRODUCTION

Gallstone disease is one of the prevalent and costly gastrointestinal diseases. The disease has a considerable load to the health care departments. Most of the cases are asymptomatic.[1-4] In Western countries; this is the most common disorder among the digestive system requiring hospital admission having a morbidity of 10%-15% in adults.[5] In the past few decades, the incidence of cholesterol gallstones has been increasing due to changing lifestyles in China.[6] The stone type peculiarly has just shifted in developing Asian countries from the pigment to cholesterol stones. The foundation for this change may be due to consumption of westernized diet and reduced rate of chronic infections.[7] In a study performed in the department of surgery, Madina Teaching Hospital, University Medical & Dental College, Faisalabad, it was found that gallstone disease is increasing in younger age group up to 25 years and especially in male patients. The complication rate is more in female patients.[8] The gallstones may be classified into cholesterol, black pigment, brown pigment and carbonate stones.[9] The majority of the stones comprise of free cholesterol, mucin glycoprotein, bilirubin calcium salts, unconjugated bilirubin, fatty acids, calcium phosphates and carbonates.[7] The stasis of bile and mucus hyper secretion are the recognized factors in causation of cholesterol stones.[10-11] There is strong association of the disease with female gender,[12] illiteracy, low socioeconomic status, smoking, intake of low fiber, diabetes, hypertension, soft drink & tea consumption, physical inactivity, multiparity, high body mass index (BMI),[13-16] junk food in the form of sweet foods and high refined sugars, low fiber contents, high fructose intake, fast food, high fat, and low vitamin C intake. Protective factors on the other hand were high intake of fiber, monounsaturated fats, fish (ω-3 fatty acids), olive oil consumption, fruit, vegetable protein intake, coffee and vitamin C supplementation.[17] Thus an association of cholecystectomy with subsequent risk of depressive disorder & insulin resistance was observed in females, but not in males.[18] The risk of cholesterol gallstone increases with consumption of fat from fried foods and meat, and the risk of pigment gallstone rise with consumption of carbohydrate from noodles. Fast & fried junk food and physical inactivity due to use of social media has led to increase in cholesterol and triacylglycerol levels resulting in causation of this disease. Laparoscopic cholecystectomy is the definitive treatment, though minimally invasive, it carries risk of complications. Patients may suffer from post cholecystectomy syndrome after surgery.[18] If the diet is modified and physical

activity improved, it can reduce the chances of the disease and operative surgery as well.

METHODOLOGY

Study Design: A cross sectional study

Place of Study: Surgical Unit-III, Allied Hospital, Faisalabad Medical University, Faisalabad

Duration of Study: June 2017 to November 2017

Method:

A total of 80 females of 20 to 45 years were included in the study. 30 cases in the control group having same age, sex & socioeconomic background were selected. 50 patients of cholelithiasis diagnosed on ultrasonography were taken. An informed consent was taken prior to study with full confidentiality regarding personal information of the participants. After permission from ethical review board of the institution, data was collected by a questionnaire regarding demographic parameters, use of fast, fried food like burger, sandwiches, pizzas, sweet & salty snacks, fries, candies and soft drink consumption. Serum cholesterol& triglycerides estimation was done by kit method using automated analyzer. Cholesterol liquicolor kit of Human Company (Thomas, L. 2012) & triglycerides liquicolor mono kit of Human Company (Schettler, G. and Nussel, E. 1975) were used. Statistical analysis was done using chi square test. Data was analyzed using SPSS version 17 to find association of gallstones with junk food & lipid profile. A p value less than 0.05 was taken as significant.

RESULTS

A total of 80 young females having age 20-45 years were included in this study during a period of four months. Results showed mean value for age 35.01 ± 5.437 standard deviation indicating maximum incidence during 30-40 years of age.

Table 1: Analysis of age with gallstones using chi square test

Age distribution	Group		Total
	Gallstones	Control	
25-35 years	19	21	40
	38.0%	70.0%	50.0%
36-45 years	31	9	40
	62.0%	30.0%	50.0%
Total	50	30	80

Chi-square value = 7.68, p-value = 0.006

Table 2: Analysis of Fried & Fast Foods with gallstones using chi square test

Fried& fast food	Group		Total
	Gallstones	Control	
yes	16	17	33
	32.0%	56.7%	41.2%
no	34	13	47
	68.0%	43.3%	58.8%
Total	50	30	80

Chi-square value = 4.708, p-value = 0.03

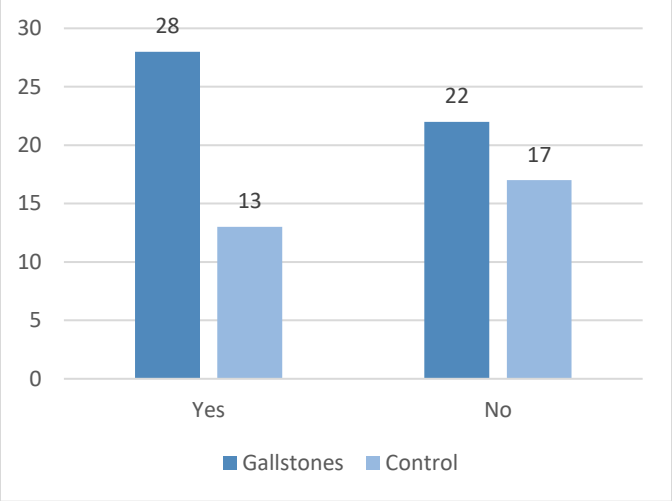

Figure 1: Analysis of soft drink with gallstones using chi square test

Chi-square value = 1.204, p-value = 0.273

Table 3: Descriptive statistics of values of Lipid profile

Variables	n	Minimum value	Maximum value	X ± SD
Cholesterol	80	101	240	167.85±27.275
Triglycerides	80	56	294	161.66±60.995

Lipid profile values were considered according to National Cholesterol Education Program (NCEP) values. Desirable value of serum cholesterol was < 200mg/dL. Borderline was considered between 200-239 mg/dL and a value 240mg/dL was taken as high risk. Desirable value of serum triglycerides was < 150mg/dL. Borderline was considered between 150-199 mg/dL and a 200-499 mg/dL was taken as high risk.

Table 4: Analysis of association of serum cholesterol with gallstones using chi square test

Increased cholesterol	Group		Total
	Gallstones	Control	
yes	7	3	10
	14.0%	10.0%	12.5%
no	43	27	70
	86.0%	90.0%	87.5%
Total	50	30	80

Chi-square value = 0.274, p-value = 0.6

Table 5: Analysis of association of serum triglycerides with gallstones using chi square test

Increased triglycerides	Group		Total
	Gallstones	Control	
yes	28	12	40
	56.0%	40.0%	50.0%
no	22	18	40
	44.0%	60.0%	50.0%
Total	50	30	80

Chi-square value = 1.92, p-value = 0.166

DISCUSSION

Gallstone disease was thought to be a disease of forties. This study shows the early occurrence of disease i.e.; 19 out of 50 female patients are in the range of 25-35years and maximum incidence is during 36-45 years. But Shrestha (2012)[20] showed that the occurrence is maximum during 20-40 years in females. Another study by Hayat N,2013 done at UMDC, MTH, Faisalabad showed early occurrence of disease up to 25 years but mainly in males.[8] Likewise Suryaparkash in 2016 [21] showed occurrence of gallstones in relatively young age; 30-40 years due to lifestyle and dietary changes. This study also shows strong association of the disease with fast & fried food. Soft drink consumption showed no association. Also, no correlation was found with hypercholesterolemia. This is same finding as in previous study by Shrestha in 2012[20] but contrary to studies by (Atamanalp 2013, Zhu 2014 and Ravikanth 2016)[22,23,24] which strongly suggested that high cholesterol is associated with gallstones. Increased triglyceride level has some association with gallstones. Strong association was seen in previous studies (Sachedeva 2011, Shrestha 2012, Zamani 2014 and Zhu 2014).[25,20,26,23]

CONCLUSION

The incidence of gallstones is increasing in younger females even up to 25 years. There is strong association of the disease with increasing age, reduced physical activity, fast & fried food. No association was found with soft drinks. No correlation was found with increased cholesterol& triglycerides. The results regarding dietary factors are conclusive. But regarding correlation with biochemical markers, inconclusive results were observed and need further exploration. As the results suggest association of disease with fast & fried food; young women can be educated regarding their diet. Physical activity benefits should be highlighted. Dietary modification & healthy lifestyle can reduce the incidence of gallstone and operative surgery as well. The operative surgery still carries a stigma in society regarding marriage in young girls. So, education on the basis of this study can be done.

REFERENCES

1. Bagaudinov KG, Saidov SS, Garilevich BA, Zubkov AD, Abdulaev RA, Ovakimian GS. Improvement of extracorporeal shockwave cholelithotripsy in the comprehensive treatment of cholelithiasis. Klin Med (Mosk). 2007;85(10):56-9.
2. Panpimanmas S, Manmee C. Risk factors for gallstone disease in a Thai population. J Epidemiol. 2009;19(3):116-21.
3. Sun H, Tang H, Jiang S, Zeng L, Chen EQ, Zhou TY, et al. Gender and metabolic differences of gallstone diseases. World J Gastroenterol. 2009;15(15):1886–91.
4. Reshetnyak VI. Concept of the pathogenesis and treatment of cholelithiasis. World J Hepatol. 2012;27;4(2):18–34.
5. Ciaula AD, Wang DQ, Wang HH, Bonfrate L, Portincasa P. Targets for current pharmacologic therapy in cholesterol gallstone disease. Gastroenterol Clin North Am. 2010;39:245–64.
6. Hou L, Shu XO, Gao YT, Ji BT, Weiss JM, Yang G et al. Anthropometric measurements, physical activity, and the risk of symptomatic gallstone disease in Chinese women. Ann Epidemiol. 2009;19(5):344-50.
7. Stinton LM and Shaffer EA. Epidemiology of Gallbladder Disease: Cholelithiasis and Cancer. Gut Liver. 2012;6(2):172–87.
8. Hayat N Duja B, Ahmad T, Rehan A. To determine the importance of age and sex in the clinical presentation and subsequent outcome in cholilithiasis. JUMDC. 2013;4(1):36-41.
9. Parviainen A, Grau JMS, López RP, Nieto JM, Garrido J, Cárdenas GC. Combined microstructural and mineralogical phase characterization of gallstones in a patient-based study in SW Spain - Implications for environmental contamination in their formation. Science of the Total Environment. 2016;573:433–43.
10. Matyja A, Gil K, Pasternak A, Sztefko K, Gajda M, Tomaszewski KA et al. Telocytes: new insight into the pathogenesis of gallstone disease. J Cell Mol Med. 2013;17(6):734–42.
11. Kong J, Liu BB, Wu SD, Wang Y, Jiang QQ, Guo EL. Enhancement of interaction of BSEP and HAX-1 on the canalicular membrane of hepatocytes in a mouse model of cholesterol cholelithiasis. Int J Clin Exp Pathol. 2014;7(4):1644–50.
12. Sharma R, Sachanl SG, Sharma SR. Preponderance of Gallstone in Female. World J Pharm Pharm Sci. 2013;2(6):5871-7.
13. Naeem M, Rahimnajjad NA, Rahimnajjad MK, Khurshid M, Ahmed QJ, Shahid SM et al. Assessment of characteristics of patients with cholelithiasis from economically deprived rural Karachi, Pakistan. BMC Res Notes. 2012;(5):334-41.
14. Harish B. A cross sectional study on causes and risk factors of gallstone disease among patients with symptomatic Cholelithiasis. Int J of Nursing Research and Practice. 2014;1(1)20-4.
15. Mousa AM, Abdul Ridha JJ. Risk Factors of Patients with Cholelithiasis in a Sample of Baghdad Teaching Hospitals. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). 2016;15(1):50-4.
16. Bilal M, Haseeb A, Saad M. Ahsan M, Raza M, Ahmed A et al. The Prevalence and Risk Factors of Gallstone among Adults in Karachi, South Pakistan. Global Journal of Health Science. 2017;9(4):106-14.
17. Ciaula AD, Garruti G, Frruhbeck G, Angelis MD, Bari OD, WangDQH et al. The Role of Diet in the Pathogenesis of Cholesterol Gallstones. Curr Med Chem. 2017;29(2);345-52.
18. Tsai MC, Chen CH, LeeH, Lin H, Lee CZ. Increased Risk of Depressive Disorder following Cholecystectomy for Gallstones. PLoS One. 2015;10(6):e0129962.
19. Park Y, Kim D, Lee JS, Kim YN, Jeong YK, Lee KG, et al. Association between diet and gallstones of cholesterol and pigment among patients with cholecystectomy. J Health Popul Nutr. 2017;36(1):39.
20. Shrestha KB, Dahal P, Shah LL, Singh R. Relation of Lipid Profile, BMI and Cholelithiasis in Nepalese Population. PMJN. 2012;12(1):40-4.
21. Suryaprakash, Tyagi S, Tyagi A. Changing trends in the epidemiology and presentation of gall stone disease in Bundelkhand region of Northern India. Indian J of Clin Anatomy and Physiology. 2016;3(2):239-42.
22. Atamanalp SS, Keles MS, Atamanalp RS, Acemoglu H, Laloglu E. The effects of serum cholesterol, LDL, and HDL levels on gallstone cholesterol concentration. Pak J Med Sci. 2013;29(1):187–90.

23. Zhu L, Aili A, Zhang C, Saiding A, Abudureyimu, K. Prevalence of and risk factors for gallstones in Uighur and Han Chinese. World J Gastroenterol. 2014;20(40):14942–9.
24. Ravikanth VV, Rao GV, Govardhan B, Sasikala M, Subramanyam C, Murthy VHV et al. Polymorphisms in UGT1 A1 Gene Predispose South Indians to Pigmentous Gallstones. J Clin Exp Hepatol. 2016;6(3):216-23.
25. Sachdeva S, Khan Z, Ansar, M A, Khalique N, Anees A. Lifestyle and gallstone disease: Scope for primary prevention. Indian J Community Med. 2011;36(4):263-7.
26. Zamani F, Sohra, M, Alipour A, Motamed N, Saeedia FS, Pirzad R. Prevalence and risk factors of cholelithiasis in Amol city, northern Iran: A population-based study. Arch Iran Med. 2014;17(11):750-4.

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