Original Article

Metabolic Syndrome in Patients Having Cholelithiasis at Tertiary Care Hospital

Metabolic Syndrome with Cholelithiasis

Rasool Bux Behan[1], Adnan Ahmed[2] and Bilal Rasool[1]

ABSTRACT

Objective: To evaluate the metabolic syndrome (MS) in patients having cholelithiasis at tertiary care hospital
Study Design: Cross-sectional study
Place and Duration of Study: This study was conducted at General Surgery Department of Liaquat University Hospital Hyderabad from November 2015 to May 2016.
Materials and Methods: Both genders were included in the study, with diagnosis of cholelithiasis on ultrasound by senior sinologist. Before surgery the selected cases metabolic syndrome was assessed. MS criteria were defined according to 3rd Report of the National Cholesterol Education Program.[24] Metabolic syndrome was carried out in all the cases clinically and fasting blood for thee fasting blood sugar and lipid profile. After results all the data was entered in the proforma.
Results: In this study majority of patients i.e. 42 (38.18%) belonged to age group of 45-50. 71(64.54%) patients were female. 60(54.55%) patients having cholilithiasis duration less than 5 years, 45.45% had more than 5 years.40(35.46%) patients have raised BMI. Regarding BP of patients 15 (13.63%) had raised systolic BP and 18 (16.36%) patients had raised diastolic BP. Fasting RBS elevated was in 40 cases. Total 29(26.36%) patients were associated with metabolic syndrome.
Conclusion: Metabolic syndrome is big prevalent and also can say a big risk factor for cholelithiasis. Female gender and older age peoples are highly affected by with gall stone due to metabolic syndrome.

Key Words: Gall stone, metabolic syndrome

Citation of article: Behan RB, Ahmed A, Rasool B. Metabolic Syndrome in Patients Having Cholelithiasis at Tertiary Care Hospital. Med Forum 2016;27(12):29-32.

INTRODUCTION

Gallstones, is very commonest event amongst the most well-known and expensive of all the gastrointestinal diseases.[1,2] Gallstones are strong calculi framed by accumulation of supersaturated bile made out of cholesterol monohydrate precious or through (black pigments) of the calcium bilirubinate polymerization.[3] In US mostly 80% cholilithiasis contains cholesterol and its particles.In earlier 2 recent decades, much has been found out about the study of disease transmission of this situation and risk factors of it. Gallstones are connected with rich diet, DM type II, hyper-insulinism, lipoid profile abnormalities, over weight and the metabolic syndrome.[1,3] Cholilithiasis frequently found incidentally during ultrasonography or CT scan of the stomach area. Just 10% to 20% of asymptomatic cases will ultimately get to be symptomatic estimably within 5- 20 years of determination.

[1.] Department of General Surgery / Radiology[2], LUMHS, Jamshoro.

Correspondence: Dr. Adnan Ahmad, Assistant Professor, Department of Radiology, LUMHS, Jamshoro.
Contact No: 0333-2700192
Email: dr.sajidarain@gmail.com

Received: September 13, 2016; Accepted: October 28, 2016

The normal rate at which patients create symptomatic cholilithiasis is small, around 2% for each year.[3,4] Development of cholilithiasis is because of changes in the direction of organic compound of release bile with a complete hyper-discharge of biliary cholesterol and related hyper-discharge of the bile acids, unbalancing the proportion and co-ordination of cholesterol/bile salts and lecithin, in a result of lithogenic bile.[5] Expansion of the cholesterol level in cytoplasmic vesicles multilaminar particles, creating space for calculus development that bunches in the strong stone form.[5]Cholelithiasis can change the location from GB to common bile duct regularly by means of cystic duct. Duct calculi can be asymptomatic or can create the dangerous complications like as cholangitisor pancreatitis.[5]MS is expanding, particularly when related co-morbidities are considered. Incidence of MS differs as indicated by investigative selected criteria. Its incidence generally is 23.7%, despite the fact that the predominance changes broadly in analysis of the population,[6] while greater in Mexican-American females 58.3% with age around 40-74year.[7]Newly incidence of MS Mexican populace was stated as 26.6% as indicated by NCEP-III criteria.[8]

A cluster of MS which comprises the intolerance of glucose, hyperinsulinemia, expanded LDL, TG, decreased HDL and hypertension.

As well as obesity that continuously expanding around the world, is nearly connected with the expanded co-morbidity and mortality brought on by a few of the most widely recognized illnesses in western world including DM, hypertension, CVD, growth, and cholilithiasis. Some studies have recognized the BMI and hyperinsulinemia are commonest causes of causes of cholesterol cholilithiasis.[9] On other hand, hyperinsulinemia is thought to be a typical element connecting cholesterol cholilithiasis including DM and Obesity.[10,11] Many studies reported different risk factors of cholelithiasis. Therefore purpose behind our study is to evaluate MS in cases having galls stone at LUMHS.

MATERIALS AND METHODS

This cross-sectional study was conducted at general surgery department of Liaquat University hospital Hyderabad. Study duration was 7 months from November 2015 to May 2016. Both genders were included in the study, with diagnosis of cholelithiasis. All the patients above 30 years of the age were incorporated. Cholilithiasis defined as strong intraluminal echoes presentations on ultrasound at radiological department. Before selection of each case, ultrasounds were repeated in fasting same radiologist. Before surgery in the entire selected cases metabolic syndrome was assessed according to criteria of 3rdReport of the National Cholesterol Education Program,[24] and this criteria was defined as:I obesity = waist circumference more than 102 cm among the males and more than 88 cm among females. II Hypertriglyceridemia =TG 1.7 mmol/L.III Low HDL <1.03 mmol/L among males and <1.3 mmol/L among females. IV Hypertension = >17.3/11.3 kPa.V=FBS ≥6.1 mmol/L. MS was carried out in all the cases clinically and fasting blood sample send to the hospital laboratory for FBS and lipid profile evaluation. After results all the data was entered in the proforma.

RESULTS

In this study majority of patients i.e. 42 (38.18%) belonged to age group of 45-50 years while 31(28.18%) patients belonged to age group of 35-44 years, 22(20%0 patients belonged to age group of 25-34 years. 39(35.45%) patients were male while 71(64.54%) patients were female. 60(54.55%) patients having cholilithiasis duration less than 5 years, 45.45% had more than 5 years.Table 1.

Regarding BMI in 40(35.46%) patients have elevated, while 70 (64.55%) patients have Normal BMI.Table 2.

Regarding BP of patients 15 (13.63%) had raised systolic BP and 18 (16.36%) patients had raised diastolic BP. While 95(86.36%) patients had normal systolic and 92(83.63%) had normal diastolic BP. Fasting RBS was normal in 70 cases while elevated was in 40 cases Table.2

Regarding lipid profile of patients 91(82.72%) patients had normal HDL level, while 51(46.36%) patients had normal LDL, 79 (71.81%) had normal TG and 89(80.90%) had normal total cholesterol level. Abnormal level of LDL was seen in 59 (53.63%), STG in 31(28.18%) and total cholesterol in 30 (19.0%).table 3 81(73.63%) patients with gall stones were without metabolic syndrome while 29(26.36%) patients were associated with metabolic syndrome. Figure 1.

Table No.1: Demographic data of patients n=110

Demographic variables	Numbers	%
Age		
15-24 years	15	13.63%
25-34 years	22	20.0%
35-44 years	31	28.18%
45-50 years	42	38.18%
Gender		
Male	39	35.45%
Female	71	64.54%
Duration of cholelithiasis		
<5 years	60	54.55%
> 5 years	50	45.45%

Table No.2: BMI, BP and FBS of the patients n= 110

Variables	Abnormal	Normal
BMI	40(35.46%)	70(64.55%)
Systolic BP	15 (13.63%)	95 (86.36%)
Diastolic BP	18 (16.36%)	92(83.63%)
RBS	30 (27.27%)	80 (72.72%)
FBS	40 (36.36%)	70 (63.63%)

Table No.3: Lipid profile of patients n= 110

Lipid profile	HDL	LDL	TG	T-cholesterol
Normal	91 (82.72%)	51 (46.36%)	79 (71.81%)	89 (80.90%)
Abnormal	19 (17.27%)	59 (53.63%)	31 (28.18%)	30 (19.0%)

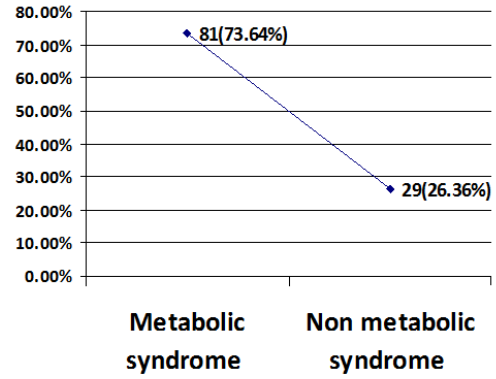

Figure No.1: Frequency of metabolic syndrome in patients n= 110

DISCUSSION

In our study, old age people were found to have metabolic syndrome more as compare to young age

group. Our results were consistent with those from previous studies conducted in the different regions of Asia and Western countries, in which older age was a significant risk factor for GSD.[11-14]. A study on senior citizens in Taiwan similarly demonstrated that age>60 years was the major risk factor for the development of GSD. Long-term exposure to associated risk factors, such Chronic environmental factors might also contribute to the effects of aging and cause cholelithiasis.[15]

Obesity is the commonest risk factor for cholilithiasis because it is linked to the increased hepatic secretion of cholesterol. The underlying mechanism for increased risk of GSD in patients with obesity could be increased bile saturation, resulting from elevated cholesterol in biliary secretion. Elevated cholesterol in biliary secretion as well as depend on more synthesis of cholesterol in obese people [12]. In our study population, we observed that obesity was significantly associated with GSD in women but not in men. In previous studies, men with GSD and high BMI have tended to be associated with other indices of obesity like as slimming management.

In our study 26.36% patients had metabolic syndrome associated with gall stones, and 64.55% pts had raised BMI and were obese. There are several studies[16-18] That examined linkb/wMS or its components and the prevalence of gallstones. Linked to MS. Chang et al[18] reported obesity and MS is higher in subjects having gallstones as compare to those without. Shaffer[19] reported obesity as a major risk factor for GD. Another study[20] also reported a recent marine research compare lean and the obese mice fed a low- versus high-carbohydra GB. It was also demonstrated that a high-carbohydrate diet exacerbates this phenomenon.

In this study females were more found to be affected with metabolic syndrome due to more chances of cholelithiasis as compare to males. Although sex as big cause of calculi remains controversial, earlier research have identified higher GSD incidence in women than in men in Western countries, with estrogen considered the cause of the sex differences.[1]

In this study 16.36% patients had raised systolic BP and 13.63% patients had raised diastolic BP.L.Y. Chen et al[11] reported that systolic BP and diastolic BP was high in cases having cholilithiasis as compared to controls. A Taiwan study stated that cholelithiasis in Asian peoples having obesity is significantly linked with increased diastolic BP[21]. BP≥ 130/85 mmHg was significantly a big cause of cholesterol gallstone[22]. Mechanism elevated BP increased risk of cholilithiasis still remains unclear. Some scholars stated that this link could be determined through action of insulin in hypertension, as well as dyslipidemia is commonest MS, no final evidence links abnormalities of lipid profile and cholilithiasis. A Korean study[23] reported the HDL level had significantly low in cases having GSD; though, they had no found any component of dyslipidemia link with MS which could be correlated with GSD formation.

CONCLUSION

In our study results we concluded that metabolic syndrome is big prevalent and also can say a big risk factor for cholelithiasis. Indicate that female sex, older age peoples are highly affected by with gall stone due to metabolic syndrome. Further big sample size studies are required for more accurate findings.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Abraham S, Rivero HG, Erlikh IV, Griffith LF, Kondamudi VK. Surgical and nonsurgical management of gallstones. Am Fam Physician 2014;89(10):795-802.
2. Lammert F, Sauerbruch T. Mechanisms of disease: the genetic epidemiology of gallbladder stones. Nat Clin Pract Gastroenterol Hepatol 2005;2(9): 427-433.
3. Wittenburg H. Hereditary liver disease: gallstones. Best Pract Res Clin Gastroenterol 2010;24(5): 747-756.
4. Portincasa P, Ciaula AD, Bonfrate L, Wang DQ. Therapy of gallstone disease: what it was, what it is, what it will be. World J Gastrointest Pharmacol Ther 2012;3(2):7-20.
5. Roesch-Dietlen F, Pérez-Morales A, Melo-Santisteban G, Díaz-Blanco F, Martínez-Fernández S, Martínez JA, et al. Frequency and Clinical, Biochemical and Histological Characteristics of Nonalcoholic Fatty Liver Disease in Patients with Gallstone Disease. Revista Cirugiay Cirurjanos 2008;76;37-42.
6. Ford ES, Giles WH, Dietz WH. Prevalence of the metabolic syndrome among US adults: findings from the third National Health and Nutrition Examination Survey. JAMA 2002; 287: 356-359.
7. Ford ES, Giles WH. A comparison of the prevalence of the metabolic syndrome using two proposed definitions. Diabetes Care 2003;26: 575-581.
8. Aguilar-Salinas CA, Rojas R, Gomez-Perez FJ, Valles V, Rios-Torres JM, Franco A, et al. Analysis of the agreement between the World Health Organization criteria and the National Cholesterol Education Program-III definition of the metabolic syndrome: Results from a population-based survey. Diabetes Care 2003;26:1635.
9. Méndez-Sánchez N, Chavez-Tapia NC, Motola-Kuba D, Sanchez-Lara K, Ponciano-Rodríguez G, Baptista H, et al. Metabolic syndrome as a risk

factor for gallstone disease. World J Gastroenterol 2005;11(11):1653-7.
10. Ruhl CE, Everhart JE. Association of diabetes, serum insulin, and C-peptide with gallbladder disease. Hepatol 2000; 31: 299-303.
11. Chen LY, Qiao QH, Zhang SC, Chen YH, Chao GQ, Fang LZ. Metabolic syndrome and gallstone disease. World J Gastroenterol 2012;18(31): 4215–4220.
12. 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.
13. Liew PL, Lee WJ, Wang W, Lee YC, Chen WY, Fang CL, et al. Fatty liver disease: predictors of nonalcoholic steatohepatitis and gallbladder disease in morbid obesity. Obesity Surg 2008; 18(7):847-53.
14. Festi D, Dormi A, Capodicasa S, Staniscia T, Attili AF, Loria P, et al. Incidence of gallstone disease in Italy: results from a multicenter, population-based Italian study (the MICOL project). World J Gastroenterol 2008;14(34):5282-9.
15. Hou WY, Tung TH, Shen HJ, Chang TY, Chou P, Liu JH. Community-based epidemiologic study on gallstone disease among elderly patients with type 2 diabetes in Kinmen, Taiwan. Int J Gerontol 2012;6(1):38-41.
16. Liu CM, Tung TH, Liu JH, Lee WL, Chou P. A community-based epidemiologic study on gallstone disease among type 2 diabetics in Kinmen, Taiwan. Digestive Dis 2004;22(1):87-91.
17. Mendez-Sanchez N, Chavez-Tapia NC, Motola-Kuba D. Metabolic syndrome as a risk factor for gallstone disease. World J Gastroenterol 2005; 11:1653-7.
18. Chang Y, Sung E, Ryu S, Park YW, Jang YM, Park M. Insulin resistance is associated with gallstones even in non-obese,non-diabetic Korean Men. J Korean Med Sci 2008;23:644-50.
19. Shaffer EA. Epidemiology and risk factors for gallstone disease: Has the paradigm changed in the 21st century? Curr Gastroenterol Rep 2005;7: 132-40.
20. Pitt HA. Hepato-pancreato-biliary fat: The good, the bad and the ugly. HPB (Oxford) 2007;9:92-7.
21. Liew PL, Wang W, Lee YC, Huang MT, Lin YC, Lee WJ. Gallbladder disease among obese patients in Taiwan. Obes Surg 2007;17: 383-390.
22. Misciagna G, Guerra V, Di Leo A, Correale M, Trevisan M. Insulin and gall stones: a population case control study insouthern Italy. Gut 2000;47: 144-147
23. Kim SS, Lee JG, Kim DW, Kim BH, Jeon YK, Kim MR, et al. Insulin resistance as arisk factor for gallbladder stone formation in Korean postmenopausal women. Korean J Int Med 2011; 26: 285-293
24. Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA 2001; 285:2486-2497.