

Study of Prevalence and risk factors of Cholelithiasis in female patients in Misan Province / Iraq. A single center study

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ABSTRACT

Background: Cholelithiasis is a worldwide health burden affecting variable age and gender categories. Cholelithiasis possess a major health concern owing to its prevalence and morbidity. Variable and interconnecting risk factors predispose to development of cholelithiasis.

Aim: To evaluate prevalence and associated risk factors of cholelithiasis in female patients in Misan province / Iraq.

Methods: This is a cross-sectional, prospective, observational study included 414 female patients recruited from Al-Sadder Teaching Hospital in Missan province from January 2015 to May 2017. The incidence of cholelithiasis and risk factors were assessed through complete history recording, clinical examination and abdominal ultrasonography.

Results: Of 414 female patients included in the current study, 69 patients had GB stones (16.7%) (Group A) and 345 patients were free of GB stones (83.3%) (Group B). Mean age in group A was 35 ± 5 years while in group B was 32 ± 6 years. Incidence of GB stones was positively correlated to hyperlipidemia and positive family history. Group A patients with thickened GB wall were significantly presented earlier and had fewer hospitalization days. Group A patients with normal GB wall were significantly presented at younger age.

Conclusion: Disturbed lipid profile and positive family history of cholelithiasis possessed a significant risk factor of GB stone development. Patients with chronic cholecystitis when complicated with GB stones showed significantly better surgical outcome. Younger GB stones' patients mostly presented with acute presentation and normal GB wall.

Keywords: Cholelithiasis, abdominal ultrasonography, prevalence, risk factors.

INTRODUCTION

Cholelithiasis (CHL) is a leading cause of morbidity worldwide. Cholelithiasis is considered one of the most prevalent gastrointestinal disorders all over the world ⁽¹⁾. Incidence of CHL is variable among different countries, despite being more prevalent in western countries, CHL incidence had markedly increased among other geographical regions².

Various risk factors were demonstrated to increase incidence of CHL³. Females are more prone to develop gall bladder stones compared to males, this mainly due to the effects of female sex hormones especially progesterone and use of contraceptive pills ⁽⁴⁾. Age category 30-40 years showed higher incidence of CHL compared to younger age⁵. Obesity and high serum cholesterol are main contributors of CHL due to secretion of extra cholesterol in the bile⁶.

Few studies were conducted to evaluate prevalence and risk factors of CHL in Iraq. A study was conducted to evaluate prevalence of asymptomatic gallstone disease and its associated risk factors among general population in Basrah. They concluded that the prevalence of gallstone was 13.6%, female gender, people with low level of education, and women who had more than 4 children were more liable to have gallstones ⁽⁷⁾. Another study done in Baghdad evaluated risk factors of CHL concluded that obesity, high serum cholesterol, female gender and sedentary lifestyle were important risk factors in developing CHL⁸.

This study was conducted to evaluate prevalence and associated risk factors of cholelithiasis in female patients undergoing abdominal ultrasonography Misan province / Iraq.

MATERIALS AND METHODS

This was a cross-sectional, prospective, observational study that included 414 female patients recruited from Al-Sadder Teaching Hospital in Missan province from January 2015 to May 2017.

All patients underwent full personal, present, past and medical history recording. Demographic data including name, age, address and marital status were recorded. Full general and abdominal examinations were done before proceeding into performing abdominal ultrasound. Venous blood samples were drawn to assess hematological parameters (mainly complete blood picture) and lipid profile.

The gallbladder was assessed with Siemens Sonoline Sienna (Siemens Healthcare, Erlangen, Germany) employing probes of 3.5-5 MHz depending on patient's size. A consultant radiologist supervised all the ultrasonographic investigations. Patients diagnosed with CHL who were eligible for surgical intervention were admitted, scheduled for surgery (either open surgery or laparoscopic) and followed up until postoperative recovery.

Ethical consideration: Purpose of the study was thoroughly explained to each participant and informed consent was obtained. Confidentiality of data was maintained.

RESULTS

The current study included 414 female patients presented with abdominal and/or right hypochondrial pain. Abdominal ultrasonographic examination revealed that 69 patients had gall bladder stones (16.7%) (Group A) and 345 patients are free from GB stones (83.3%) (Group B). Mean age of group A was 35 ± 5 years while in group B was 32 ± 6 years. Demographic data of included patients are presented in

table 1, while risk factors and clinical assessment are demonstrated in table². Abdominal ultrasonographic findings in group A (cases) and operative follow-up are demonstrated in table 3. Comparison of GB ultrasonographic findings and hospitalization days in relation to various risk factors are demonstrated in tables^{4,5,6}.

Table 1: Demographic data of included patients

		Group A (cases)	Group B (control)	P value
Age group	<30 years	47 (11.3%)	158 (38.2%)	0.034*
	≥30 years	22 (5.3%)	187 (45.2%)	
Residency	Urban	45 (10.9%)	197 (47.5%)	0.230
	Rural	24 (5.8%)	148 (35.8%)	
Gravidity	Multigravida	58 (14%)	300 (72.5%)	0.563
	Nulligravida	11 (2.6%)	45 (10.9%)	

Table 2: Clinical data and risk factors assessment in included patients

		Group A (cases)	Group B (control)	P value
Family history	Present	33 (7.9%)	100 (24.2%)	0.013*
	Absent	36 (8.7%)	245 (59.2%)	
Clinical presentation	Epigastric pain	26 (6.3%)	166 (40.1%)	0.145
	Rt. hypochondrial pain	43 (10.4%)	179 (43.2%)	
Duration of pain	< 1 month	48	88	0.115
	> 1 month	21	257	
Contraception	OCP use	27 (6.6%)	42 (10.1%)	0.114
	Other or no use	95 (22.9%)	250 (60.4%)	
Jaundice	Present	9 (2.2%)	0	0.001*
	Absent	60 (14.5%)	345 (83.3%)	
Hypertension	Present	23 (5.5%)	40 (9.7%)	0.000*
	Absent	46 (11.1%)	305 (73.7%)	
Hematological disorders	Present	0	10 (2.4%)	0.381
	Absent	69 (16.6%)	335 (81%)	
WBCs count	Elevated	38 (9.2%)	35 (8.4%)	0.001*
	Normal	31 (7.5%)	310 (74.9%)	
Lipid profile	Elevated	50 (12.1%)	102 (24.6%)	0.001*
	Normal	19 (4.6%)	243 (58.7%)	

Table 3: Ultrasonographic findings in group A and operative follow-up (cases)

Gall bladder wall thickness	Normal	52 (75%)
	Thickened	17 (25%)
GB stones number	Single	15 (22%)
	Multiple	54 (78%)
Operative decision	Laparoscopic	64 (93%)
	Open surgery	5 (7%)
Hospitalization days	< 3 days	65 (94%)
	≥ 3 days	4 (6%)
Postoperative complications	Present	1 (2%)
	Absent	68 (98%)

Table 4: Relation of GB wall thickness with various risk factors

		GB wall thickness		P value
		Normal	Thickened	
Age group	<30 years	37 (54%)	10 (14%)	0.007*
	≥30 years	21 (30%)	1 (2%)	
Duration of pain	< 1 month	9 (13%)	39 (56%)	0.036*
	> 1 month	8 (12%)	13 (19%)	
Contraception	OCP use	21 (30%)	10 (15%)	0.880
	Other or no use	27 (39%)	11 (16%)	
Lipid profile	Elevated	27 (39%)	13 (19%)	0.055
	Normal	25 (36%)	4 (6%)	

Table 5: Relation of GB stones number with various risk factors

		GB stones number		P value
		Single	Multiple	
Age group	<30 years	8 (11%)	39 (57%)	0.213
	≥30 years	7 (10%)	15 (22%)	
Duration of pain	< 1 month	13 (19%)	35 (51%)	0.416
	> 1 month	7 (10%)	14 (20%)	
Contraception	OCP use	10 (14%)	10 (14%)	0.434
	Other or no use	20 (29%)	29 (43%)	
Lipid profile	Elevated	9 (12%)	22 (32%)	0.244
	Normal	6 (8%)	32 (48%)	

Table 6: Relation of hospitalization days with various risk factors

		Hospitalization days		P value
		< 3 days	≥ 3 days	
Age group	<30 years	43 (62%)	4 (6%)	0.299
	≥30 years	22 (32%)	0	
Duration of pain	< 1 month	46 (67%)	2 (3%)	0.135
	> 1 month	18 (26%)	3 (4%)	
Contraception	OCP use	31 (46%)	1 (2%)	0.642
	Other or no use	34 (48%)	3 (4%)	
Lipid profile	Elevated	30 (43%)	1 (2%)	0.622
	Normal	35 (51%)	3 (4%)	

DISCUSSION

The current study aimed to evaluate prevalence and associated risk factors of cholelithiasis in female patients undergoing abdominal ultrasonography Misan province / Iraq. Mean age of included patients was 35±5 years while in control group was 32±6 years. We concluded that the prevalence of CHL in the included sample of patients was 16.7%. Evaluation of risk factors revealed that incidence of CHL was positively associated with positive family history and hyperlipidemia. Patients with CHL had significantly higher total WBC count and serum levels of bilirubin. Moreover, younger patients had significantly normal GB wall on U/S evaluation, however, patients with thickened GB wall presented earlier than patients with normal GB wall.

Several studies evaluated the prevalence of CHL in Iraq, Khalf et al., 2016⁷ studied the prevalence of asymptomatic gallstone disease and its associated risk factors among general population in Basrah. They concluded that prevalence of gallstone was 13.6%. It increased with advanced age. Female gender, people with low level of education, and women who had more than 4 children were more liable to have gallstones. Their concluded results were similar to our results regarding the prevalence and increase incidence with advancing age⁷.

Female patients are more liable to CHL especially with multiparty, female's sex hormones and pregnancy hormones increase the incidence of GB stones formation⁹. Increased levels of female sex hormones lead to increased catabolism of their cholesterol nuclei leading to increased cholesterol excretion in the bile thus increasing chance of GB stones formation¹⁰.

Positive association of hyperlipidemia with incidence of GB stones is a recognized risk factor. Hyperlipidemia especially hypercholesterolemia significantly increases GB stone formation^{11,12}. High familial prevalence of gallstones has been well recognized and GB gallstones are more common by a ratio of 3:1 in siblings and other family

members of affected persons than unrelated controls^{13,14}. These data support the positive association between family history and GB stones incidence in our study.

Normal GB wall thickness' association with younger age can be explained by lack of chronic inflammatory affection of the GB wall as most of these patients are presented with acute cholecystitis. Moreover, patients with thickened GB wall were presented earlier than patients with normal GB wall can be due to chronicity and multiple stones formation that increased the risk of obstructive jaundice and cholecystitis. Most patients whose underwent surgical cholecystectomy both open or laparoscopic revealed minimal complications and few hospitalization days.

CONCLUSION

Several risk factors are implicated in the incidence of CHL, advanced age, female gender, family history and hyperlipidemia possess pivotal role in development of GB stones. Assessment of GB wall thickness provides helpful overview of the CHL prognosis and surgical outcome.

REFERENCES

1. Byna, S.S. Epidemiological and pathological study of resected gall bladders due to cholelithiasis. *Int J Chem Life Sci.* 2019; 2(7): 1195-1198.
2. Bansal, A., Akhtar, M., Bansal, A.K. A clinical study: prevalence and management of cholelithiasis. *Int Surg J.* 2016; 1(3): 134-139.
3. Pak, M., Lindseth, G. Risk factors for cholelithiasis. *Gastroenterol Nur.* 2016 Jul 1;39(4):297-309.
4. Pimpale, R., Katakwar, P., Akhtar, M. Cholelithiasis: causative factors, clinical manifestations and management. *Int Surg J.* 2019; 6(6): 2133-2138.
5. Khan, I., Ahmed, T., Iqbal, M.M., Khan, M.I., Shah, S.H., Perveen, S. Relationship of BMI and age with cholelithiasis. *J Surg Pakistan (International).* 2017; 22(3).
6. DiCiala, A., Wang, D.Q., Portincasa, P. Cholesterol cholelithiasis: part of a systemic metabolic disease, prone to

- primary prevention. *Expert Rev Gastroenterol Hepatol.* 2019; 13(2): 157-171.
7. Khalaf, S.K., Al Mousawi, J.H., Hussein, A., Al Asadi, J. Prevalence and Risk Factors of Asymptomatic Gallstones in a Sample of Population in Basrah, Iraq. *Arch Med.* 2016; 8: 1-6.
 8. Taher, M.A. Descriptive study of cholelithiasis with chemical constituents' analysis of gallstones from patients living in Baghdad, Iraq. *Int J Med Medi Sci.* 2013; 5(1):19-23.
 9. Völzke, H., Baumeister, S.E., Alte, D., Hoffmann, W., et al. Independent risk factors for gallstone formation in a region with high cholelithiasis prevalence. *Digestion.* 2005; 71(2): 97-105.
 10. Stinton, L.M., Myers, R.P., Shaffer, E.A. Epidemiology of gallstones. *Gastroenterol Clin.* 2010; 39(2): 157-69.
 11. Cui, Y., Li, Z., Zhao, E., Cui, N. Risk factors in patients with hereditary gallstones in Chinese pedigrees. *Med Princ Pract.* 2012; 21(5): 467-471.
 12. Grigor'eva, I.N., Maliutina, S.K., Voevoda, M.I. Role of hyperlipidemia in cholelithiasis. *Exp Clin Gastroenterol.* 2010; (4): 64.
 13. Vanderlinden, W., Lindeloef, G. The familial occurrence of gallstone disease, *Acta Genet Stat Med.* 1965; 15: 159-164.
 14. Linden, WVd., Simonson, N. Familial occurrence of gallstone disease. Incidence in parents of young patients, *Hum. Hered.* 1973; 23: 123-127.