The Prevalence of Gall Bladder Diseases during Pregnancy in Baghdad Teaching Hospital

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ABSTRACT:

BACKGROUND:

Gallbladder disease,defined as biliary sludge and stones, is a significant cause of maternal morbidity during pregnancy**.** Gallbladder disease has a higher incidence in women than in men and is particularly high in multigravida women. Pregnancy is considered to be one of the major risk factor for cholesterol cholelithiasis.

OBJECTIVE:

To estimate the prevalence and determinants of gallbladder diseases in women during pregnancy in Baghdad Teaching Hospital.

PATIENTS AND METHODS:

Cross sectional study was carried out on total 500 pregnant women attending Obstetrical and Gynecological outpatient clinic in Baghdad Teaching Hospital using a convenient sampling technique, during the period from 7th of January to 18th of April 2016. A designed questionnaire was prepared for this study and information was taken by direct interview with pregnant women. Ultrasound was done and women with cholecystectomy were excluded.

RESULTS:

Out of 500 pregnant studied the overall prevalence of gallbladder disease was 10.8%. older age (>35 years) (27.5%), higher parity (39.3%), advancing gestational age (third trimester 16.6%), previous use of contraceptive pills (29.9%), diabetic (30%) and a positive family history (90.9%) were factors significantly associated with gallbladder disease. Most of pregnant with gallbladder disease were asymptomatic (66.7%).

CONCLUSION:

There is a risk of GBD in pregnancy, mostly asymptomatic. This risk might be increased with advanced maternal age, increased parity and gestational age, OCP use, DM, previous history of GBD and positive family history.

KEYWORDS: Pregnancy, gallbladder diseases, cholelithiasis

INTRODUCTION:

Pregnancy is considered to be one of the major risk factor for cholesterol cholelithiasis. The incidence of gallbladder disease ranges from 3.3 to 12% in pregnant woman [(1)]. In fact, gallbladder diseases are the second most common indication for non-obstetrical surgical intervention in pregnancy and is the leading non-obstetrical cause for hospitalization in the first year postpartum [(2, 3)].

During pregnancy, high levels of estrogen increase the saturation of cholesterol in the bile, virtually all of the gallstones associated with

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Additionally, high levels of estrogen and progesterone could impair gallbladder motility function by inhibiting gallbladder smooth muscle contractile function, thus leading to gallbladder stasis. Such abnormalities greatly promote the formation of biliary sludge and gallstones in pregnant women. The incidence of disease appears to be increased in the last two trimesters of pregnancy [(5)]. Parity and length of the fertility period increase the incidence of gallstones [(5)]. The risk of gallbladder disease increased with each subsequent birth and that this risk appears to be present in women many years following their last birth [(6)].

These findings could be explained by the fact that with each pregnancy, there is a repeated exposure to high estrogen levels, resulting

in a cumulative increase in the likelihood of development of gallstones or the enlargement of pre-existing gallstones and therefore an increased potential for symptomatic gallbladder disease later in life [6].

Breastfeeding was found to reduce the risk of gallbladder disease in parous women. As estrogen levels are known to fall during lactation, it is possible that the protective effect of breastfeeding could be mediated through estrogen, although there are other hormonal changes that occur with lactation that may also have an effect [6]. High carbohydrate intake has been linked to insulin resistance, obesity, and abnormal serum lipid profiles, conditions which favor gallstone formation [7]. Most, but not all, studies have found that the risk of developing cholesterol gallstones is markedly increased by oral contraceptive steroids and conjugated estrogens in premenopausal women [5]. The aim of the study is to determine the prevalence of gallbladder diseases in Iraqi pregnant women and to assess the predisposing factors associated with them.

PATIENTS AND METHODS:

Study design: A cross – sectional study was conducted in Obstetrical and Gynecological outpatient clinics in Baghdad Teaching Hospital in Baghdad-Iraq during the period from 7th of January 2016 to 18th of April 2016.

Definition and selection of the cases: The study included all fasting pregnant women who attended the Obstetrical and Gynecological outpatient clinics in Baghdad Teaching Hospital during the study period and sent for ultrasonography as a follow up of pregnancy. Pregnant with history of cholecystectomy or chronic liver disease were excluded. Diagnosis of gallbladder diseases was confirmed by ultrasonography. An ultrasound can evaluate the gallbladder for the presence of gallstones, thickened walls, polyps, or masses. Verbal permission after explaining the aim of the study was obtained from each participant enrolled in the study prior to collecting data. All personal information was kept anonymous.

Data collection tool: The study was carried out by direct interview with pregnant women. A designed questionnaire was prepared and it includes socio-demographic information, obstetric history, breast feeding history, past history of gallbladder disease during previous pregnancy, medical history of blood diseases (coagulative disorders) and diabetes mellitus, history of contraceptive use and family history of gallbladder diseases.

Statistical analysis: Analysis of data was carried out using the available Statistical Packages for Social Sciences version 25. Data were presented in simple measures of frequency & percentage. The significance of difference of different percentages (qualitative data) were tested using Pearson Chi-square test (χ^2-test) with application of Yate's correction or Fisher Exact test whenever needed. Statistical significance was considered whenever the P value was equal or less than 0.05.

RESULTS:

Out of 500 pregnant women, the U/S revealed that 54 (10.8%) of them had gall bladder disease (either stone or sludge). (Table 1).

Table 1: Distribution of study group by presence of gall bladder disease

Gall bladder Disease		No. (n= 500)	Percentage (%)
No		446	89.2
Yes	Stone	51	10.2
	Sludge	3	0.6

Table 2 showed the distribution of study group according to some demographic characters and GBD in study groups. The highest prevalence of GBD was seen in patients aged ≥ 35 (27.5%) with a significant association (P= 0.001) between age and GBD. No significant association was detected between GBD and all other variables (Occupation, P= 0.174; residence, P= 0.732; and educational level, P= 0.761).

Table 2: Distribution of study group according to some demographic characters and GBD

Demographic characters		GBD (%) n= 54	No GBD (%) n= 446	Total n= 500	P - Value
Age (years)	< 20	1 (2.7)	36 (97.3)	37 (7.4)	0.001
	20 - 34	17 (5.1)	315 (94.9)	332 (66.4)	
	≥ 35	36 (27.5)	95 (72.5)	131 (26.2)	
Occupation	Employee	5 (6.4)	73 (93.6)	78 (15.6)	0.174
	Housewife	49 (11.6)	373 (88.4)	422 (84.4)	
Residence	Urban	48 (10.6)	403 (89.4)	451 (90.2)	0.732
	Rural	6 (12.2)	43 (87.8)	49 (9.8)	
Educational Level	Illiterate	3 (7.5)	37 (92.5)	40 (8)	0.761
	Primary School	12 (9.8)	110 (90.2)	122 (24.4)	
	Secondary School	22 (10.7)	184 (89.3)	206 (41.2)	
	Higher education	17 (12.9)	115 (87.1)	132 (26.4)	

Regarding relation between GBD and obstetrical history, 39.3% of women with parity of four or more had GBD with a significant association (P= 0.001). Rate of GBD is increasing with increasing in gestational age as 5.2% in first trimester to reach 16.6% at the third trimester with a significant association (P= 0.003). When trimester was considered, the result showed statistical significant association between trimester and GBD as shown in table (3)

Table 3: Relation between GBD and obstetrical history

Obstetrical Information		GBD (%) n= 54	No GBD (%) n= 446	Total n= 500	P - Value
Parity	0	1 (1.7)	57 (98.3)	58 (11.6)	0.001
	1 -- 3	31 (8.0)	355 (92.0)	386 (77.2)	
	≥ 4	22 (39.3)	34 (60.7)	56 (11.2)	
History of abortion	Yes	32 (9.8)	295 (90.2)	327 (65.4)	0.315
	No	22 (12.7)	151 (87.3)	173 (34.6)	
Age of menarche (Years)	< 13	22 (9.7)	205 (90.3)	227 (45.4)	0.466
	≥ 13	32 (11.7)	241 (88.3)	273 (54.6)	
Age of first birth (Years)	< 20	17 (12.8)	116 (87.2)	133 (30.1)	0.578
	20 - 34	34 (11.3)	266 (88.7)	300 (67.9)	
	≥ 35	2 (22.2)	7 (77.8)	9 (2.0)	
Breast Feeding	Yes	38 (11.8)	283 (88.2)	321 (72.6)	0.871
	No	15 (12.4)	106 (87.6)	121 (27.4)	
Duration of Breast Feeding (Months)	< 2	1 (5.0)	19 (95.0)	20 (6.2)	0.6
	2 - 6	18 (11.8)	134 (88.2)	152 (47.4)	
	> 6	19 (12.8)	130 (87.2)	149 (46.4)	
Trimester of Pregnancy	1st	9 (5.2)	165 (94.8)	174 (34.8)	0.003
	2nd	19 (11.2)	150 (88.8)	169 (33.8)	
	3rd	26 (16.6)	131 (83.4)	157 (31.4)	

The highest percentage of women with GBD was asymptomatic 66.7%, while for the symptomatic category, food intolerance particularly to fats is the highest symptom (94.4%) as shown in table (4).

Table 4: Signs and Symptoms of study women diagnosed with GBD

Signs and Symptoms	No. (n= 54)	Percentage (%)
Asymptomatic	36	66.7
Right upper quadrant pain	10	55.6
Epigastric pain (Radiate to back / Right shoulder)	12	66.7
Nausea & Vomiting	12	66.7
Dyspepsia	13	72.2
Murphy's sign	4	22.2
Food intolerance particularly to fats	17	94.4
Alteration in bowel frequency	8	44.4

Presence of GBD in previous pregnancies, previous use of OCP, DM, and family history all were found to be significantly associated with GBD (83.3%, P= 0.001; 29.9%, P= 0.001; DM, P= 0.001; and 90.9%, P= 0.001 respectively), while history of blood diseases (P= 0.075) and OCP type (P= 0.614) were not significantly associated with prevalence of GBD. (Table 5)

Table 5: Distribution of study group according to some past medical history and GBD

Previous History		GBD (%) n= 54	No GBD (%) n= 446	Total n= 446	P - Value
GBD in previous pregnancies	**Yes**	5 (83.3)	1 (16.7)	6 (1.4)	**0.001**
	No	48 (11.0)	388 (89.0)	436 (98.6)	
History of blood diseases	**Yes**	3 (27.3)	8 (72.7)	11 (2.2)	**0.075**
	No	51 (10.4)	438 (89.6)	489 (97.8)	
History of previous use of OCP	**Yes**	20 (29.9)	47 (70.1)	67 (13.4)	**0.001**
	No	34 (7.9)	399 (92.1)	433 (86.6)	
OCP type	**Combined**	17 (28.8)	42 (71.2)	59 (88.1)	**0.614**
	Progesterone only	3 (37.5)	5 (62.5)	8 (11.9)	
Diabetes Mellitus	**Yes**	9 (30.0)	21 (70.0)	30 (6.0)	**0.001**
	No	45 (9.6)	425 (90.4)	470 (94.0)	
Family history of GBD	**Yes**	40 (90.9)	4 (9.1)	44 (8.8)	**0.001**
	No	14 (3.1)	442 (96.9)	456 (91.2)	

DISCUSSION

In this study, 54 pregnant had gallbladder disease out of 500 with a prevalence of 10.8%. Similar result was found in a study conducted in India (6.7% and 14.4% for gallstone and biliary sludge respectively) [(1)]. Lower result was in studies conducted in Saudi Arabia (4.4%) [(8)], Iran (7.7% for biliary sludge and 1.9% for gallstone) [(9)], Bangladesh (8.1%) [(10)], and Nigeria (2.9% for gallstone and 2% for biliary sludge) [(11)]. Higher rate was seen in a study by the university of southern California (15% for biliary sludge and 6% for gallstones) [(2)]. These variations in prevalence might be due to the fact that gallstones formation is a complex multifactorial disease associated with dietary habits, physical activity, ethnicity, socioeconomic status, demographic and geographical factors [(12)].

In this study, factors as age and parity, trimester of pregnancy, previous history of GBD, previous use of OCP, and family history of GBD were significantly associated with increased risk of GBD. A studies conducted in Iran [(9)], India [(1)], and USA [(13)] showed that GBD is significantly associated with older age and increased parity.

This might be explained by the fact that with each pregnancy, there is a repeated exposure to sex hormones resulting in a cumulative increase in the likelihood of development of gallstones [(6)].

Also, frequent changes in gallbladder volume with each pregnancy, the residual gallbladder volume, and the cholesterol content of bile may lead to conditions that favor the formation of gallstones.

A significant association between trimesters of pregnancy and GBD since the prevalence increased with each trimester, reached the peak in the third trimester which is in consistence with a result found by a study from India 2010 [(1)] which stated that prevalence of gallstone disease increased with advancing gestational age. This could be explained by the fact that the concentration of plasma female sex hormones increases proportionally with the duration of gestation, the risk of gallstone formation is especially hazardous in the third trimester of pregnancy [(5)], also there is a change in bile composition with a decrease in cholesterol saturation during the last two trimesters of pregnancy in addition to the increment in gallbladder volume with a delayed rate of emptying during the last two trimesters.

A study conducted in United States [(14)] showed similar result where a significant relationship was reported between cholelithiasis development and pregnant women had history of GBD prior to current pregnancy. Increase in lithogenic index of the bile and other study showed delay emptying of the gallbladder in user of oral contraceptives [(15)] all might be explained the effect of previous use of oral contraception pills on the prevalence of GBD, this was in agreement with previous studies from Iraq [(16)] and India [(17)].

Also this study showed that there was significant association between history of diabetes mellitus and GBD, this in consistence with study from United States in 2008 which reported that insulin resistance is a risk factor for incident gallbladder sludge and stones during pregnancy [(18)].

In conclusion, this study showed that there is a risk of GBD in pregnancy, mostly asymptomatic. This risk might be increased with advanced maternal age, increased parity and gestational age, OCP use, DM, previous history of GBD and positive family history.

REFERENCES:

1. Gangwar R, Dayal M, Dwivedi M, Ghosh UK. Gallbladder disease in pregnancy. The Journal of Obstetrics and Gynecology of India. 2011 Feb 1;61(1):57-61.
2. Mendez-Sanchez N, Chavez-Tapia NC, Uribe M. Pregnancy and gallbladder disease. Annals of hepatology. 2006;5(3):227-30.
3. Veerappan A, Gawron AJ, Soper NJ, Keswani RN. Delaying cholecystectomy for complicated gallstone disease in pregnancy is associated with recurrent postpartum symptoms. Journal of Gastrointestinal Surgery. 2013 Nov 1;17(11):1953-9.
4. Castro LC, Ogunyemi D. Common medical and surgical conditions complicating pregnancy. In: Hacker NF, Gambone JC, Hobel CJ. Hacker and Moore'S Essentials Of Obstetrics And Gynecology. 5th edition. Philadelphia: Saunders/Elsevier; 2010.p. 191 -218.
5. de Bari O, Wang TY, Liu M, Paik CN, Portincasa P, Wang DQ. Cholesterol cholelithiasis in pregnant women: pathogenesis, prevention and treatment. Annals of hepatology. 2014 Dec 24;13(6):728-45.
6. Liu B, Beral V, Balkwill A, Million Women Study Collaborators. Childbearing, breastfeeding, other reproductive factors and the subsequent risk of hospitalization for gallbladder disease. International journal of epidemiology. 2008 Sep 5;38(1):312-8.
7. Wong AC, Ko CW. Carbohydrate intake as a risk factor for biliary sludge and stones during pregnancy. Journal of clinical gastroenterology. 2013 Sep;47(8):700.
8. Abu Eshy SA, Mahfouz AA, Badr A, El Gamal MN, Al Shehri MY, Salati MI et al. Prevalence and risk factors of gallstone disease in a high altitude Saudi population. East Mediterr Health J. 2007; 13(4):794-802.
9. Moghaddam TG, Fakheri H, Abdi R, Bari Z. The incidence and outcome of pregnancy-related biliary sludge/stones

and potential risk factors. Archives of Iranian Medicine (AIM). 2013 Jan 1;16(1).

10. Hossain GA, Islam SM, Mahmood S, Chakrabarty Rk, Akhter N. Gallstone in pregnancy. Mymensingh Medical Journal 2003 ;12(2) :p.112-116.

11. Ibitoye BO, Adisa AO, Makinde ON, Ijarotimi AO. Prevalence and complications of gallstone disease among pregnant women in a Nigerian hospital. International Journal of Gynecology & Obstetrics. 2014; 125(1):41-3.

12. Jarrar BM, Al-Rowaili MA. Chemical composition of gallstones from Al-jouf province of Saudi Arabia. The Malaysian journal of medical sciences: MJMS. 2011 Apr;18(2):47.

13. Ko CW, Beresford SA, Schulte SJ, Matsumoto AM, Lee SP. Incidence, natural history, and risk factors for biliary sludge and stones during pregnancy. Hepatology. 2005 Feb;41(2):359-65.

14. Lindseth G, Bird□Baker MY. Risk factors for cholelithiasis in pregnancy. Research in nursing & health. 2004 Dec;27(6):382-91.

15. Reshetnyak VI. Concept of the pathogenesis and treatment of cholelithiasis. World Journal of Hepatology. 2012 Feb 27;4(2):18.

16. Mousa AM, Abdul Ridha JJ . Risk Factors of Patients with Cholelithiasis in a Sample of Baghdad Teaching Hospital. IOSR Journal of Dental and Medical Sciences 2016 ;15(1): p .50-54.

17. Rambal S, Manhas K, Sharma S, Gupta S. Ultrasound Evaluation of Gallbladder Disease in Pregnancy. Jk Science 2001; 3(2): p. 78-83.

18. Ko CW, Beresford SA, Schulte SJ, Lee SP. Insulin resistance and incident gallbladder disease in pregnancy. Clinical Gastroenterology and Hepatology. 2008 Jan 1;6(1):76-81.