Research article

Prevalence and some selected characteristics of asymptomatic gallstones among pregnant women. A retrospective chart review

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Abstract

Introduction: During pregnancy, it is often associated with gallstones and biliary sludge. Gallstone disease is the second most common indication for non-obstetric surgical intervention in pregnancy.

Methods: A retrospective chart review was carried out to determine the prevalence and characteristics of asymptomatic gallstones among selected sample of pregnant women in a private hospital in Colombo, Sri Lanka. Data was retrieved from the available records at hospital from 2016 to 2022. There were 329 patients records during the study period. An exclusion criteria was applied to select the subjects. Data pertains to demographic, haematological, bio-chemical and hepatobiliary sonography was retrieved. The study data were analysed using STATA (StataCorp LLC Texas, USA) software version 16 for Windows. Normality was determined using the Kolmogorov-Smirnov's test. Categorical variables like gallbladder status and blood group were presented using frequency tables. The mean values of age, gestational age, and gravidity were compared t-test and ANOVA. Gallbladder status was compared to age group, gravidity, trimester, and blood group using Chi-squared test. P values of <0.05 were considered significant.

Results: The study sample consists of 300 pregnant women records. The means age of pregnant mother with gallstone and sludge was statistically higher than the normal gallbladder. Multigravida was higher among the study sample (63%). The most of the study subjects were in third trimester (68%). Majority (97%) had normal gallbladder, 2% had gallstones and 1% had sludge. A higher proportion of gallstones were identified among mothers age more than 30 years. Muliti-gravid had higher proportion of gallstones and sludge. The third trimester was identified as higher proportion of gallstones and sludge. All the cases who had gallstone and sludge were Blood group type "O".

Conclusion: This sample shows that a higher proportion of gallstones and sludge were identified among mothers whose age more than 30 years, muliti-gravid, in their third trimester and blood group of type "O". Further studies are needed to generalize this study finds to Sri Lankan setting.

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Introduction

The prevalence of gallstone disease is higher among females. During pregnancy, it is often associated with gallstones and biliary sludge. Multigravida women are more susceptible to gallstone disease. It has been found that gallstone disease is the second most common indication for non-obstetric surgical intervention in pregnancy[1-5]. The geographical location seems to have variations in the prevalence of gallstone disease among women. In the United States and Latin-American countries, the prevalence of gallstones is higher in adult women than in other countries[1].

Furthermore, the race also plays a part in gallstone disease prevalence. Native American, and Mexican American women are more likely to develop cholelithiasis than Asian, Caucasian or African women[2-9]. There are several associated factors and pathophysiological explanations to reason out why gallstones disease is likely to occur during pregnancy. Obesity, metabolic syndrome, high-fat diet, lack of physical activity and hormones are some of the associated factors[1]. The common pathophysiological explanations are an increased level of oestrogen during pregnancy that causes an indirect increase in cholesterol saturation and an inhibition of gallbladder contractility due to a higher level of progesterone[10]. Our study aimed to assess the prevalence, pattern, and characteristics of gallstone disease in a cohort of gravid Sri Lankan women.

Methods

A retrospective chart review was carried out to determine the prevalence and characteristics of asymptomatic gallstones among selected sample of pregnant women in a private hospital in Colombo, Sri Lanka. Data was retrieved from the available records at hospital from 2016 to 2022. There were 329 patients records during the study period. These records consist of manually written bed head charts, discharge summaries and electronic medical records. Pregnant mothers with pre-existing medical or surgical conditions or pregnancy related complications have been excluded from the study. Subjects with previous history of gallstone disease, ascites, diabetes mellitus, metabolic syndrome, and pre-existing hepatobiliary diseases were excluded. Furthermore patient's records which did not clearly mention the ultrasound scene finds or illegible handwriting were excluded from the study. Out of that only 300 [91.2%] patient's charts were eligible for the study. Data pertains to demographic, haematological, bio-chemical and hepatobiliary sonography was retrieved from the hospital records. The normal gallbladder, biliary sludge and gallstones were diagnosed according to standard ultrasonographic features[11-13]. Gravidity was defined as the sum of all pregnancies (including all live births and pregnancies that terminated at 5 pregnancies)[15].

Data analysis

The study data were analysed using STATA (StataCorp LLC Texas, USA) software version 16 for Windows. Normality was determined using the Kolmogorov-Smirnov's test. Categorical variables like gallbladder status and blood group were presented using frequency tables. The mean values of age, gestational age, and gravidity were compared t-test and ANOVA. Gallbladder status was compared to age group, gravidity, trimester, and blood group using Chi-squared test. P values of <0.05 were considered significant.

Results

The study sample consists of 300 pregnant women records. The mean (±SD) age of the subjects was 29. 30 ± 3.56 years (Age range, 28-43 years). The means (±SD) age of pregnant mother with gall stone and sludge was statistically higher than the normal gallbladder. (34.5 (±2.3) vs. 33.2 (±3.4) vs. 27.8 (±3.1) [ANOVA: P=0.02]). There were 53% of pregnant women whose age was more than 30 years. Multigravida was higher among the study sample (63%). The most of the study subject were in third trimester (68%). Seventy-five percent (75%) had blood group O, 15% had blood group B. 7% had blood group A and 3% had blood group AB. Majority (97%) had normal gallbladder, 2% had gallstones and 1% had sludge. There were no cases of cholecystitis (Table 1).

Table 2 shows the association between some of the selected characteristics of the study sample and the gallbladder status. A higher proportion of gallstones were identified among mothers age more than 30 years. (83.3%). Sludge was only detected among mothers with age more than 30 years. Muliti-gravid had higher proportion of gallstones and sludge (83.3% and 100%). The third trimester was identified as higher proportion of gallstones and sludge (66.7% and 100%). All the cases who had gallstone and sludge were Blood group type "O".

Table 1. The characteristic of the study population

Variable	Number (n=300)	%
Age (In years)		
<30	141	47
>30	159	53
Gravidity		
Primi-gravida	111	37
Multi-gravida	189	63
Trimester		
1st	48	16
2nd	48	16
3rd	204	68
Blood group		
A	21	7
B	45	15
O	225	75
AB	9	3
Gallbladder status		
Normal	291	97
Gall stone	6	2
Sludge	3	1

Table 2. Association between some of the selected characteristics of the study sample and the gallbladder status

Variable	Gallbladder status			P-value
	Normal (n=291)	Gallstones (n=6)	Sludge (n=3)	
Age (In years)				
<30	140 (48.1%)	1 (16.7%)	0	Fisher's Exact
>30	151 (51.9%)	5 (83.3%)	3 (100%)	test = 0.07
Gravidity				
Primi-gravida	110 (37.8%)	1 (16.7%)	0	Fisher's Exact
Multi-gravida	181 (62.2%)	5 (83.3%)	3 (100%)	test = 0.29

(Continued)

Variable	Gallbladder status			P-value
	Normal (n=291)	Gallstones (n=6)	Sludge (n=3)	
Trimester				
1st	47 (16.1%)	1 (16.5%)	0	Fisher's Exact
2nd	47 (16.1%)	1 (16.5%)	0	test = 0.08
3rd	197 (67.7%)	4 (66.7%)	03 (100%)	
Blood group				
A	21 (7.2%)	0	0	Fisher's Exact
B	45 (15.5%)	0	0	test = 0.13
O	216 (74.2%)	6 (100%)	3 (100%)	
AB	9 (3.1%)	0	0	

Discussion

A spectrum of gallbladder diseases in pregnancy has been reported[16]. Even though many imaging modalities (CT, MRI, radionuclide imaging, magnetic resonance cholangiopancreatography – MRCP, endoscopic retrograde cholangiopancreatography – ERCP, etc.) could be used to evaluate the gallbladder and/or biliary tree, ultrasonography is the preferred imaging method in gravid women because it is fast, cheap, sensitive, and does not use ionizing radiation[9]. Cholelithiasis and biliary sludge were the gallbladder pathologies seen in this study.

It is noted in our study age had a significant association with the occurrence of gallbladder disease (Likelihood ratio = 7.116; P=0.03). Our finding is quite similar to the available literature. This is similar to findings in studies, where a significant correlation was found between patients' age and an increased prevalence of gallstones[5, 17,18]. Furthermore according to literature reported that the prevalence of biliary disorders is higher in older multiparous pregnant women who are in the third trimester[19]. In our study 1 subject was less than 30 years of age and others were more than 30 years of age. All women with biliary sludge were older than 30 years.

In our study, there was 1/6 primigravida woman with gallstone while 5/6 of the women with gallstones had two or more pregnancies. This is similar with a number of studies which show that the incidence of gallstone increases with the number of pregnancies[4,10,20]. In contrast to 6 women with stones, 2 had biliary sludge. There are many associate factors that have been associated with the formation of biliary sludge. Biliary sludge is a mixture of bile precipitate and bile, which is transient and a precursor to the formation of bile stones[21]. In this study, all the pregnant women who had gallstones and sludge (100%)] had blood group O. According to our results, blood group O was the commonest blood group. This is again in keeping with the current literature[21].

The pregnant women with gallstones, 16% of this study were in the 1st trimester, 16% were in the 2nd trimester and 68% were in the 3rd trimester. Most of the pregnant women with gallstones were in the 3rd trimester. There were two (2/6) in the first and second trimesters, respectively. This correlates with literature, as most gallstones have been reported during the second and third trimester[23]. Also, the two pregnant women who had biliary sludge were both in the third trimester. This finding is similar to those of a study[1,20]. This present study shows a higher incidence of gallstones compared to sludge in pregnant women.

Conclusion

This sample shows that a higher proportion of gallstones and sludge were identified among mothers whose age more than 30 years, muliti-gravid, in their

third trimester and blood group of type "O". Further studies are needed to generalize this study finds to Sri Lankan setting.

Study limitation

This was a retrospective study with a small size. As a result despite having detected higher portions of gallstones and sludge among mothers whose age more than 30 years, muliti-gravid, in their third trimester and blood group of type "O" we are unable to demonstrate statically significant difference among the groups.

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'Authors' contributions

VA, formulated the concept and design of the study, acquisition of data and analysis, and drafted the article. All authors reviewed the manuscript.

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Availability of data and materials

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request.

Data collection and ethical approval

Nawaloka Research and Education Foundation, Nawaloka Hospital PLC, Colombo.

Competing interests

The authors declare that they have no competing interests.

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