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Research Article

A Study of Serum Total Bile Acids in Pregnant Women

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A B S T R A C T

Bile stasis, which is one of the hepatobiliary disorders during pregnancy, is manifested by symptoms such as itching, insomnia, fatigue, bleeding, and the amount of total bile acid increases in laboratory tests. Elevation of total bile acids is advantageous not only as a diagnostic criterion, but also as an assessment of fetal risks due to cholestasis.

Cholestasis during pregnancy the mean and intergroup parameters of serum total bile acids were studied in healthy and clinically symptomatic women.

A total of (n=73) women participated in the study, and (n=36) had cholestasis (n=37) were healthy women with clinical symptoms. Mean serum total bile acids in cholestasis 19.0±9.2 μmol /l (p <0.001) was determined in women with clinical symptoms, while in healthy women (n=37) it was 4.4±2.9 μmol /l (p <.001), cholestasis 20.4±12.2 μmol /L (p <.001) was determined in women with hepatitis virus with clinical symptoms, respectively. Shows that total bile acids in women's serum increase when symptoms of cholestasis appear.

Keywords: Cholestasis during pregnancy; Cholestasis; Itching

1. Introduction

Intrahepatic cholestasis of pregnancy (ICP) is a pregnancy-specific liver disorder characterized by maternal pruritus in the third trimester raised serum bile acids and increased rates of adverse fetal outcomes[1]. Serum total bile acid (TBA) measurement is now considered to be the most suitable biochemical marker for both the diagnosis and monitoring of ICP[1, 2]. In our country, serum total bile acid measurement is not used for diagnosis of ICP and there is no founded any of data about ICP and TBA measurements. In our study, the range of TBA in Mongolian pregnant women was investigated for aiming to analyze the changing pattern of TBA and clinical approach women with ICP.

1.1 Background

Intrahepatic cholestasis of pregnancy is caused by hormonal changes during pregnancy, heredity, and many other factors, resulting in the stagnation of bile in the liver and the increase of bile acid in the blood serum. Is a disease[1-5].

Cholestasis during pregnancy is a disease with a good prognosis from the mother's point of view[1]. But from the point of view of the fetus, if early diagnosis and measures are not taken, the fetus is at risk of death. The biggest risk for a pregnant woman with cholestasis is premature birth, which occurs in 19-29% of all cases, fetal distress syndrome in 22-33%, contamination of the amniotic fluid in 15%, and sudden fetal death in 1-2%[1,2]. The cause of these fetal risks is the increase of total bile acids in the woman's serum, which confirms the diagnosis and evaluates the risk to the fetus. During pregnancy, total bile acid values up to 10 μmol /L are considered normal, while 10-40 μmol /L is considered elevated, and more than 40 μmol /L is considered excessive, and this is considered a high risk for the fetus[1,3]. Cholestasis during pregnancy, and the research work and protocols in this field are rare in Mongolia.

Purpose

To study serum bile acid during pregnancy and determine the clinical importance of TBA.

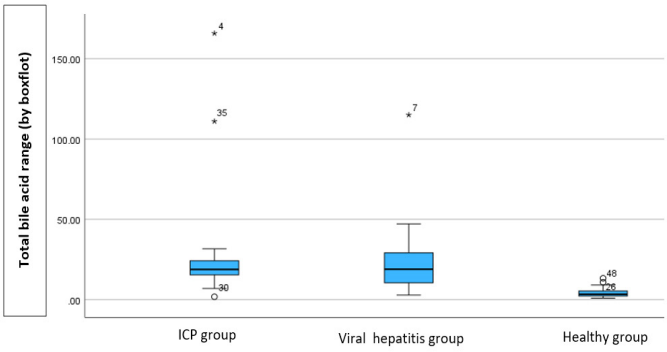
2. Materials And Methods

We conducted our study in a hospital-based, cross-sectional design. During the data collection process, the participants were divided into 2 groups, the total bile acid parameters and the pregnant women's demographics, pregnancy and delivery status, risk of disease complications, clinical and laboratory tests were collected and compared for each group studied. And in the hospital The mean total bile acid values of women with symptoms of cholestasis were compared between groups with and without hepatitis virus.

3. Result

A total of (n=73) mothers were included in the study , of which (n=36) had cholestasis with clinical symptoms and (n=37) were healthy mothers, respectively. Median age of total participations was 32 ±5.9, median number of pregnancy was 3 ±1.8, median number of delivery was 2 ±1.1, average length pregnancy age was 32 ±3.1. In healthy women who are not presenting with cholestatic symptoms (n=36), the median and quartile of total bile acid level was 3.36 µmol/l (2.21 – 5.42).

In healthy women who are not presenting with cholestatic symptoms (n=37), the median and quartile of total bile acid level was 3.36 µmol/l (2.21 – 5.42). In women who are presenting with cholestasis of pregnancy(n=26), the average total serum bile acid was 19.0±9.2 µmol/l (14.97 – 23.75). (**Figure 1**).



The below table shows the mean value, standard deviation, and P value of laboratory indicators of total bile acids in mothers with clinical symptoms and healthy mothers (**Table 1**).

Table 1: Mean total bile acid values of the subjects.

Indicator	Group	Num-ber	Average	Standard deviation	P value
Total Bile Acid (TBA)	With cholesta-sis	36	19.0 (1.79 – 47.1) µmol /l	9.2	<.001
	Healthy	37	4.4 (0.95 – 13.3) µmol /l	2.9	<.001

From the table above, cholestasis It is determined that the average value of total bile acid in pregnant women with clinical symptoms and healthy women is different with standard significance.

Cholestasis in our study 41.3 percent of women with clinical symptoms of hepatitis with viral infection, and the table below compares total bile acid values for each category of viral infection. (Table 2.) 13.9 percent of them were infected with hepatitis C virus, 22.2 percent were infected with B and D viruses, and 5.6 percent were infected with B virus alone.

Table 2: Hepatitis total bile acid parameters in virally infected women.

Name of group	Percent	HC (µmol /l)	P value	95% CI
hepatitis virus	21 (9.1)	18.06 ± 6.4	<.001	15.1 – 6.4
Hepatitis virus	15	20.4 ± 12.2	<.001	13.6 – 27.2
• HBV	2 (5.6)	21.75		
• HCV	5 (13.9)	10.6 ± ٨,٢		
• HBV + HDV	8 (22.2)	26.4 ± 11.8		
A healthy group	37 (100)	4.4 ± 2.9	<.001	3.3 – 5.3

Total bile acid was "normal" in 7.7% of women with ICP and was "increased" in 92.3% of them. Severe elevation of TBA had 7.7% of women with ICP. Itchy is the main symptom of ICP and presents severe 53.8 percentage of women with ICP and hepatitis virus. Skin lesion was presented in 69.3 percent of them. Participants who studied their delivery were 35, and 60 percent of them was preterm delivery. Women with preterm delivery had higher TBA elevation compared to normal delivery (34.31 vs. 16.28, p=0.016).

Table 3: Serum concentration of TBA in women with preterm and mature delivery.

	Number of women	TBA mean (min - max)	TBA median (25^{th} – 75^{th})	P value
Preterm delivery	21	34.31 (165.81 - 1.79)	18.9 (24.75 – 14.95)	**0.016**
Mature delivery	16	16.28 (47.1 – 2.84)	15.4 (19.1 – 10.4)	

*TBA-total bile acid

4. Conclusion

TBA level was "normal" in 94.7 percent of healthy women and "elevated" in 92.3 percent of women with ICP. TBA level was a statistically significant difference (p=0.001) between healthy and cholestatic groups (including ICP and viral hepatitis). Preterm delivery had 54.5 percent of women with ICP and 64.2 percent of viral hepatitis.

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