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Effect Normal Pregnancy and Duration on Liver Enzymes Tests

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Abstract

The current study was designed to investigate the changes of liver enzymes during normal pregnancy. To achieve the intended aim, 185 pregnant women of aged 20 â?? 37 years(60 women in first trimester, 65 women in second trimester and 60 women in third trimester of pregnancy), also the study contain70 women(control individuals) in age near to age of pregnant women. The levels of Alanine amino transferase(ALT), Aspartate amino transferase(AST) and Alkaline Phosphatase(ALP) were determined by enzymatic methods. The results indicated a significant ($P<0.05$) increase of ALT and significant($P<0.01$) increase of AST activities in pregnant women in third trimester when compared with those of the control group, while ALP indicated higher significantly($P<0.0005$) in third and second trimester when compared with control group.

Index terms— alanine amino transferase(ALT), aspartate transferase(AST) and lkaline phosphatase (ALP)

1 Introduction

he liver in the body is the most important organ after the heart. Performing many important functions including metabolism, detoxification and formation of important compounds including blood clotting factors and albumin (16). The pregnant women experiences physiological changes to support fetal growth and development (1,2,3). The levels of estrogens (estradiol) and progesterone increase progressively during pregnancy (4,5). These sex hormones have effects on hepatic metabolic, synthesis, and excretory functions (6,7,8). The biliary excretion of bromosulophthalein decreases during late pregnancy and the clearance of some compounds that are secreted into bile may therefore be impaired (9,10). The phenomenon of hemodilution secondary to the increase in plasma volume decreases the serum protein concentrations. Consequently, certain changes in values of liver function tests occur during normal pregnancy (11,12,13). Pregnancy does not change liver size but in the third trimester the enlarging uterus displaces the liver superiorly and posterioly, therefore a palpable liver II.

2 Materials and Methods

Four groups of individuals were included in this study. Group 1 contained 60 pregnant women in first trimester of pregnancy (1 -3 months). Group 2 consisted of 65 pregnant women in second trimester of pregnancy (4 -6 months). Group 3 comprised 60 pregnant women of pregnancy (7 -9 months) and Group 4 contained 70 non pregnant women as control in this study.

Disposable syringes and needles were used for blood collection. Venous blood samples, about 5ml were collected from pregnant and non pregnant women (control group). The blood collected in a polyethylene tubes without anticoagulant, allowed to clot at room temperature for 15 min, blood samples were centrifuged at 3000Xg for 15 min, sera were removed and stored at -17 C until analysis. Labrotary data were obtained by using available kits; serum ALT, serum AST (Randox Kit) and serum ALP (Kind and King). The results were expressed as mean ±SD students t test was used for comparison of different groups with controls. Author : Dept. of Bio chemistry, college of medicine, university of Kufa, IRAQ. e-mail: Duniam.mohammedali@uokufa.edu.iq disease (14,15). Liver cell injury or necrosis is measured by determent Glutamate Oxaloacetate Transaminase (AST) and Glutamate Pyruvate Transaminase(ALT) levels (17). While liver synthetic function is quantified by determining

albumin level and prothrombin time. Biliary obstraction are elevated by measuring alkaline phosphatase (18). The most commonly used indicators of liver damage (hepatocellular) are the alanine aminotransferase (ALT) and aspartate aminotransferase (AST), formerly referred to as SGPT and SGOT (19). These are enzymes normally found in liver cells that leak out of these cells and make their way to the blood when liver cells are injured. The ALT is felt to be a more specific indicator of liver inflammation as AST is also found in other organs such as the heart and skeletal muscle, the level of the ALT and AST may be used as a general measure of the degree of liver inflammation or damage (19, **??**0). Measurement of serum alanine aminotransferase (ALT) and aspartate aminotransferase (AST) activities levels is the most useful tests for the routine diagnosis of liver diseases (18,19). While serum Alkaline phosphatase (ALP) activity level increase in late pregnancy, mainly during the third trimester. **??**) Influence the duration of pregnancy time on liver enzymes activities. To demonstrate the influence of duration of pregnancy time on ALT, AST and ALP values in pregnant women. As shown in Table3 no significant in ALT and AST activities in second trimester when compared with those of the first trimester, while a significant (P<0.01) less elevation of ALP activity in the same comperation. On the other hand there were significant (P<0.0001) increases in ALT,AST and Alp activities levels in third trimester when compared with those of first trimester, the table show also a significant(P<0.001) increase in activities levels of AST and ALP during the third trimester when compared with those of second trimester and less elevation in significant(P<0.01) for ALT activity.

3 III.

4 Results

5 Discussion

In the present study ALT, AST and ALP activities were measured in 185 healthy pregnant women and 70 control group not receiving oral contraception. None of the women included had evidence of liver disease. When liver cells are damaged or destroyed, the enzymes in the cell leak out into the blood, where they check the blood for two main liver enzymes ALT and AST (22,23).

In the present investigation that serum ALT activity was significantly higher during the third trimester than in controls (P<0.05). The present results were in agreement with previous works (24,25), while Bacq et al (12) found that serum ALT activity was significantly higher during the second trimester than in controls but was no different during the third trimester. The current results illustrated that serum AST activity was significantly higher during the third trimester than in controls (p<0.01), two other studies found the same results (14,26), while Bacq et al (12) have stated that serum AST activity was during all three trimesters not significantly higher than in control group. Other study (27) found a significant increase in AST levels between first and third trimester of pregnancy. An increase in ALT and AST levels was found during labor, which might be caused by contractions of uterine muscle (28,29).

The results indicate that serum ALP activity was significantly higher during the third and second trimesters as compared to control group (P<0.0005). This is primarily due to placental is oenzyme production (30,31). During the third trimester, there was also increase in the production of the bone is oenzyme. The results of this study, showed serum ALT, AST and ALP increased in normal pregnancy as compared to non pregnant women. Prospective study on liver dysfunction in pregnancy in south west wales, 2005.

V.

6 Conclusions

1. The results indicated a significant increase of ALT in pregnant women in third trimester when compared with those of the control group. 2. The levels of AST activity in cease significantly in third trimester when compared with those of control group. 3. The ALP activity indicated higher significantly in third and second trimester when compared with control group. 4. Liver enzymes activities elevated during normal pregnancy.

VI.

Figure 1: T

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Parameter	Subjects	NO	Mean±SD	P Value
	Control	70	7.0±2.5	
ALT (U/L)	1 st . trimester 2 nd .	60 65	7.1±2.8 7.8±2.8	N.S N.S
	3 rd .	60	9.5±3.3	<0.05
	Control	70	14.5±2.5	
AST (U/L)	1st. 2 nd .	60 65	18.9±3.3 23.7±6.1	N.S N.S
	3 rd .	60	38.9±4.5	<0.01
ALP(U/L)	Control 3 rd . 1 st . 2 nd .	70 60 60 65	75.2±11.1 379.0±70.2 79.2±25.2 173.1±46.8	N.S <0.0005 <0.0005

Figure 2: Table 1 :

2

Parameter	ALT		AST		ALP	
	r	P	r	P	r	P
ALT			0.85	<0.0005	0.89	<0.0005
AST	0.85	<0.0005			0.9	<0.0005
ALP	0.89	<0.0005	0.9	<0.0005		

Figure 3: Table 2 :

3

Parameter	1 st Vs 2 nd Trimester	1 st Vs 3 rd Trimester	2 nd Vs 3 rd Trimester
ALT	N.S	0.001	0.01
AST	N.S	0.001	0.001
ALP	0.01	0.001	0.001

IV.

Figure 4: Table 3 :

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