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Activity of hepatic enzymes from week sixteen of pregnancy

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Objective: This study was undertaken to determine the prevalence, epidemiology, and mother-child repercussions of increased alanine-aminotransferase levels from week 16 of pregnancy.
Study design: A longitudinal observational study of 381 pregnant women. The cause of increased alanine-aminotransferase levels during pregnancy and repercussions on the neonate were studied in 283 cases. Statistical analysis was performed with Mann-Whitney test, χ^2 test, or the Fisher exact test.
Results: The mean age of the mothers was 29.9 $\pm$ 4.8 years. Twenty-five percent presented increased gamma-glutamyl-transpeptidase, alkaline phophatase, and dehydrogenase lactate from week 32. Increased alanine-aminotransferase was observed in 7.4% (95% CI, 5.00%-10.57%) of cases. Clinical disorders were light, transitory, and with no apparent cause, except for 1 hemolysis, elevated liver enzymes, low platelets (HELLP) syndrome, 3 preeclampsias, and 1 gravidic cholestasis. No statistically significant differences were observed in the group of mother-child with alanine-aminotransferase normal or increased.
Conclusion: Most increases in alanine-aminotransferase from week 16 of pregnancy are transitory, non-specific, and have no repercussions on mother or child.

During pregnancy, liver disorders may occur, with varying, but sometimes extremely severe clinical effects. Comprehensive studies have been made of the hemolysis, elevated liver enzymes, low platelets (HELLP) syndrome, gravidic cholestasis, the fatty liver of pregnancy, and other preexisting liver diseases, whether concomitant or pregnancy associated.[1-8] However, few studies have been carried out concerning the prevalence of liver disorders and the effects of pregnancy on the biochemical profile. Previous studies have reported a reduction in total bilirubin (BRRt),[9] in the free fraction and in gamma-glutamyl-transpeptidase (GGT),[9-12] as well as an increase in alkaline phosphatase (ALP)[9] through the placenta isoenzyme and in alanine-aminotransferase (ALT).[9-11] These changes are evident on comparison

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Table I General and gestational antecedents and current data on pregnant women with normal and raised ALT

	Age*	Weight†	Primiparous	Prior illnesses	Gestational antecedents	Hepatotropos virus	Tobacco	Drugs	Alcohol
Total n = 380 (%)	29.9 ± 4	67.7 ± 12	150 (39%)	52 (13%)	51 (13%)	6 (1.6%)	96 (25%)	11 (3%)	12 (3%)
Normal ALT n = 352 (%)	29.9 ± 5	64 ± 7	136 (39%)	47 (13%)	47 (19%)	4 (1%)	89 (25%)	8 (2%)	11 (3%)
Raised ALT n = 28 (%)	29.5 ± 4	64.2 ± 9	14 (50%)	5 (18%)	4 (14%)	2 (7%)	7 (25%)	3 (11%)	1 (4%)
P	NS	NS	NS	NS	NS	NS	NS	NS	NS

* Mean ± SD (y).
† Mean ± SD (kg).

Table II Socioeconomic data for pregnant women with normal and raised ALT

	Single-parent family	Medium-low cultural level	Low income	Home owner	No good living conditions	Prenatal control* (incorrect)	Deficient family planning	Antecedents of liver disease (transfusions)
Total n = 380 (%)	16 (4.2%)	174 (46%)	58 (15%)	303 (80%)	62 (16%)	5 (1.5%)	19 (5%)	15 (4%)
Normal ALT n = 352 (%)	9 (3%)	164 (47%)	55 (16%)	281 (80%)	59 (17%)	4 (1%)	17 (5%)	11 (3%)
Raised ALT n = 28 (%)	7 (25%)	10 (36%)	3 (11%)	22 (79%)	3 (11%)	1 (4%)	2 (7%)	4 (14%)
P	< .05	NS	NS	NS	NS	NS	NS	< .1

* Prenatal control (incorrect): One or more check-up visits missed during pregnancy.

of serum levels of pregnant women with those of the general population. Some authors have remarked on the need to use comparison ranges that are appropriate for pregnant women, to enable a greater power of discrimination of liver diseases.[13-15]

The social changes that have taken place in recent years may have had an effect on the normal course of pregnancies. Such changes include the increased proportion of women at work, the possibility of women who have severe illnesses (transplant patients, and those who have chronic disease) becoming pregnant, pregnancy among adolescents, and the appearance of invasive techniques in achieving and monitoring pregnancies. To date, no studies have been performed to show the effects of these changes on the incidence of liver disease among pregnant women. The aims of this study are to determine the behavior pattern of the hepatic biochemical profile, to assess the prevalence of increased ALT from week 16 of pregnancy and to analyze the clinical course of increases in ALT. We also sought to investigate the epidemiologic and socioeconomic factors involved and the possible repercussions on mother and child.

Material and methods

Study site

The study was carried out at the San Cecilio University Hospital in Granada (Spain).

Study participants

A prospective study was made up of 381 women aged between 16 and 42 years, from week 16 of their pregnancy. The study was approved by the hospital's Ethics Committee, and informed consent was received from all participants. The criterion for inclusion in the study was that the pregnancy should have been normal until week 16, defined as normal maternal-fetal evolution, determined by routine controls performed until that time. Only 1.3% of the participants failed to complete the prenatal observation program.

Data collection procedures and measures

All the participants responded to an epidemiologic survey providing demographic data, personal and obstetric history, information on habits, socioeconomic data, and social risk factors (Tables I and II). Table III shows the data of the pregnant women with increased ALT.

Clinical analytic follow-up

The participants were clinically and analytically evaluated at weeks 16, 28, 32, 36, and 40. On each occasion, BRRt, aspartate aminotransferase (AST), ALT, GGT, ALP, and dehydrogenase lactate (LDH) were determined. The pregnant women presenting ALT values equal to or higher than 40 U/L (the range of normality in our laboratory) were subjected to a study protocol to establish possible etiologic factors, namely, cholesterol,