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ORIGINAL ARTICLE

Serum total IgE level during pregnancy and postpartum

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Abstract
Background: Studies on serum IgE levels during pregnancy are limited.
Objective: To investigate the course of serum total IgE levels during pregnancy and postpartum.
Methods: 159 pregnant subjects provided 218 serum samples during various stages of pregnancy and the postpartum period. Serum total IgE geometric means were compared at various trimesters and postpartum. In addition, the postpartum IgE data were analysed according to the method of delivery. Analysis was also done according to history of allergy.
Results: The geometric mean serum total IgE was 20.5 IU/ml in the first trimester, 20.8 IU/ml in the second and 22.2 IU/ml in the third. Postpartum serum IgE level showed a lower mean, 14.9 IU/ml during the early postpartum period (less than 30 days) compared to 30.3 IU/ml during the late postpartum period (30 days-25 weeks). However this was not statistically significant. Serum IgE in the postpartum period also did not differ according to method of delivery. A history of allergy was positive in 98 samples, negative in 61 and unclear in 59. Using analysis of variance, none of these three groups showed significant change in serum total IgE level during pregnancy or postpartum.
Conclusion: In this cross-sectional study, serum total IgE levels showed no statistically significant changes during pregnancy or postpartum. This finding would be of greater weight if reproduced in a larger number of subjects with multiple serial samples at fixed regular time intervals during pregnancy and postpartum.

Introduction

Pregnancy is associated with several physiological, hormonal and immunological changes. Studies on serum immunoglobulin levels are limited in number and showed conflicting findings. Reports show that the levels of IgG did not change[1–3] or decreased significantly.[4–9] The fall in serum IgG levels may be attributed to the haemodilution during pregnancy and transplacental transfer of maternal IgG to the fetus.[10] Serum IgA was shown to have no change,[1,3,5,9] decreased[4,8] or increased.[7] Similarly, serum IgM was shown to have no change,[1,3,5,9] decreased[4,8] or increased.[7]

Serum total IgE level is often used in allergy practice as a general marker of atopy, although it is neither inclusive

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nor exclusive. However, the basal serum total IgE level in health is influenced to varying degrees by numerous factors including genetics, age, race, season, mode of infant feeding and tobacco smoking.[11] Studies on the effect of pregnancy on serum total IgE are limited. Serum IgE was shown to have no change,[10,12] decreased,[13] or slightly increased.[14] Pregnant asthmatics who had increasing or unchanged IgE were shown to have a tendency for asthma exacerbations.[15] Most of these studies were based on a relatively small number of subjects and did not use logarithmic transfer of IgE level in the statistical analysis. One study[16] reported a slight increase in total IgE levels at one month postpartum compared to the third trimester, but did not include samples during the first or second trimester.

The objective of our study was to look for any quantitative changes in serum total IgE level during different stages of pregnancy and the postpartum period.

Methods

The study was approved by the Institutional Review Board at Louisiana State University Medical Center. Pregnant women attending prenatal clinics and undergoing routine blood tests were informed of the study. If a written consent was obtained, the left-over serum samples were collected whenever the subject underwent routine blood test during pregnancy and after delivery. Parental consent is not required for pregnant subjects under 18 years of age. The serum samples were then stored at -4°C for later measurement of total IgE level. A total of 159 pregnant women (age 15-39 years, mean 24.2 years) provided a total of 218 serum samples; 162 during pregnancy and 56 postpartum. All serum samples were collected from healthy subjects. In 98 (44.9%) of samples, the donor had a history of allergy defined as a physician-diagnosed or a strong medical history compatible with allergic rhinitis, asthma, urticaria, angio-oedema, atopic eczema, or systemic anaphylaxis.

Statistical analysis

The IgE data were analysed using logarithms. Trends of change in IgE level were examined by comparing the geometric means at various trimesters and postpartum. Since the samples were mostly from different women, the study is primarily cross-sectional. Student's t-test was used to compare two means[17] and analysis of variance was used to assess the variation between more than two means.[18] In addition to the time variable, the postpartum IgE data were analysed according to the method of delivery; vaginal versus caesarean section. Analysis was also done according to the history of allergy.

Results

Serum IgE level during pregnancy and postpartum

Of the 218 serum samples obtained, 26 were during the first trimester, 81 during the second, 55 during the third, and 56 were during the first 25 weeks after delivery. The concentration of serum IgE showed no statistically significant variation during pregnancy. The geometric mean serum IgE was 20.5 IU/ml in the first trimester, 20.8 IU/ml in the second, and 22.2 IU/ml in the third (Table 1). Postpartum serum IgE level showed a lower mean, 14.9 IU/ml during the early postpartum period (less than 30 days) compared to 30.3 IU/ml during the late postpartum period (30 days-25 weeks). However this was not statistically significant, probably due to the small number of samples. The 56 postpartum sera were available from 45 women; 30 whose delivery was by caesarean section with a mean IgE level of 15.1 IU/ml, which was similar to that in the 15 women who had normal vaginal delivery of 17.5 IU/ml. Understandably, follow-up visits and postpartum blood drawing was more in women whose delivery was by caesarean section.

Table 1 Total IgE level in 218 serum samples from 159 subjects during pregnancy and postpartum.

Time of serum sample	n	Gx	Gx ± SD	Gx 95% CI
First trimester	26	20.5	6.1–68.9	1.8–231.2
Second trimester	81	20.8	6.1–70.6	1.8–239.9
Third trimester	55	22.2	5.7–86.3	1.5–335.7
< 30 days postpartum	41	14.9	3.1–70.8	0.7–336.5
≥ 30 days postpartum	15	30.3	13.4–68.6	5.9–155.2

Gx = geometric mean in IU/ml; SD = standard deviation; CI = confidence interval.

Subjects with serial serum samples

Seven subjects had multiple serum samples drawn throughout their course of pregnancy and postpartum period (Fig. 1). Serum IgE levels remained almost unchanged except in two subjects; one (DM) had a sharp decline early in pregnancy and a slower decline following delivery, and the other (DS) showed a sharp serum IgE rise in the early postpartum period.

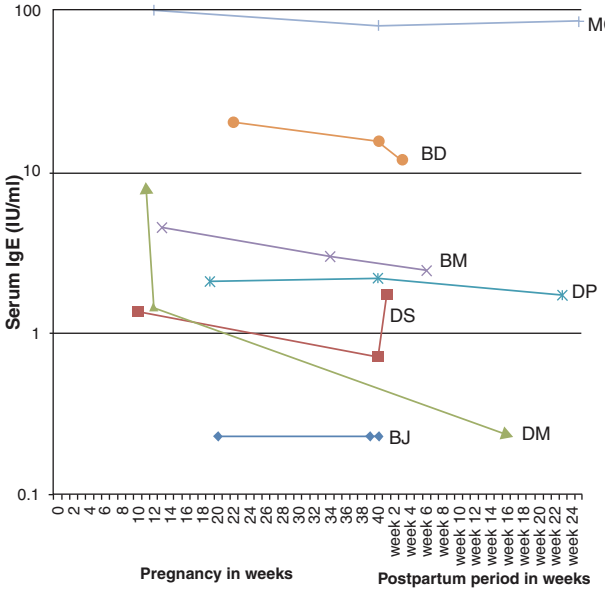

Figure 1 Course of Serum total IgE level during Pregnancy and Postpartum in 7 Subjects with Multiple Serial Samples.