Results

The mean values ± SEM for maternal serum IGF-1 levels in different studied groups are presented in table 1 and figure 1.

It has been shown that there is an increase in the mean maternal serum IGF-1 levels among the (LGA) group in comparison with the (AGA) group. Meanwhile, there is a decrease in the mean maternal serum IGF-1 levels among the (SGA) group in comparison with the (AGA) group.

Statistical evaluation to these differences is presented in table 2. It was found that there is a statistically non-significant difference between the (LGA) and (AGA) maternal serum mean values of IGF-1, while the differences in the maternal serum mean values of IGF-1 between the (LGA) and (SGA) groups were found to be statistically significant ($P<0.05$). The differences in the maternal serum mean values of IGF-1 between the (AGA) and (SGA) groups were found to be statistically non-significant.

The mean values ± SEM for fetal serum IGF-1 levels in different studied groups are presented in table 1 and figure 1.

It has been shown that there is an increase in the mean serum fetal IGF-1 levels among the (LGA) group in comparison with the (AGA) group. Meanwhile, there is a decrease in the mean fetal serum IGF-1 levels among the (SGA) group in comparison with the (AGA) group.

Statistical evaluation to these differences is presented in table 2. It was found that there is a statistically significant difference between the (LGA) and (AGA) groups in the fetal serum mean values of IGF-1 $(P<0.05)$. The differences in the fetal serum mean values of IGF-1 between the (LGA) and (SGA) groups were found to be statistically highly significant $(P<0.01)$. The differences in the fetal serum mean values of IGF-1 between the (AGA) and (SGA) groups were found to be statistically non-significant.

Multiple regression analysis of all samples between serum maternal IGF-1 and serum fetal IGF-1 levels among the 3 studied groups was found to be non-significant $(r = 0.3897, -0.3994, -0.4055$ for (LGA), (AGA), (SGA) groups respectively as demonstrated in table 3) indicating that there was no linear association between serum maternal and fetal IGF-1 in each of the 3 groups.

Multiple regression analysis between serum maternal IGF-1 and birth weight was found to be non-significant among the 3 studied groups (r=0.0174, -0.2179, -0.1956 in (LGA), (AGA), (SGA) groups respectively as demonstrated in table 3).

However, the serum fetal IGF-1 levels were found to be highly correlated with birth weights in both (LGA) and (AGA) groups, where the correlation co-efficients "r" equal 0.8468 and 0.8717 respectively and their corresponding P values were found to be statistically highly significant (P<0.01 for each).
There was no correlation between serum fetal IGF-1 levels and birth weights among the (SGA) group (r=0.5788). The linear positive associations for the correlated relationship between serum fetal IGF-1 levels and birth weights among the (LGA) and (AGA) groups are presented in figures 2 and 3 respectively.

The mean values ± SEM for maternal serum C-peptide levels in different studied groups are presented in table 4 and figure 4.

It has been shown that there is an increase in the mean maternal serum C-peptide levels among the (LGA) group in comparison with the (AGA) group. Meanwhile, there is a decrease in the mean maternal serum C-peptide levels among the (SGA) group in comparison with the (AGA) group.

Statistical evaluation to these differences is presented in table 5. It was found that there is a statistically highly siginificant difference between the (LGA) and (AGA) maternal serum C-peptide mean values (P< 0.01), while the differences in the maternal serum mean values of C-peptide between the (LGA) and (SGA) groups were found to be statistically very highly significant (P< 0.001). The differences in the maternal serum mean values of C-peptide between the (AGA) and (SGA) groups were found to be also statistically significant (P< 0.05).

The mean values ± SEM for fetal serum C-peptide levels in different studied groups are presented in table 4 and figure 4. It has been shown that there is an increase in the mean fetal serum C-peptide levels among the (LGA) group in comparison with the (AGA) group. Meanwhile, there is a decrease in the mean fetal serum C-peptide levels among the (SGA) group in comparison with the (AGA) group.

Statistical evaluation to these differences is presented in table 5. It was found that there is a statistically non-significant difference between the (LGA) and (AGA) fetal serum mean values of C-peptide, while the differences in the fetal serum mean values of C-peptide between the (LGA) and (SGA) groups were found to be statistically significant (P<0.05). The differences in the fetal serum mean values of C-peptide between

the (AGA) and (SGA) groups were found to be statistically non-significant.

Multiple regression analysis of all samples between serum maternal C-peptide and serum fetal C-peptide levels among the 3 studied groups showed that there is a positive correlation between serum maternal and fetal C-peptide levels among the (LGA) and (SGA) groups, where the correlation co-efficients "r" equal 0.6242 and 0.8762 respectively and their corresponding P values were found to be statistically significant (P<0.05 and P<0.01 respectively as demonstrarted in table 6).

However, there was no correlation between serum maternal and serum fetal C-peptide levels among the (AGA) group (r=0.3617).

The linear positive associations for the relationship between serum maternal and serum fetal C-peptide levels in the (LGA) and (SGA) groups are presented in figures 5 and 6 respectively.

Multiple regression analysis between serum maternal C-peptide and birth weight was found to be non-significant among the 3 studied groups (r=0.3649, 0.3552, 0.2738 in the (LGA), (AGA), (SGA) groups respectively as demonstrated in table 6) indicating that there were no linear associations

between serum maternal C-peptide and birth weight in each of the 3 groups.

However, the serum fetal C-peptide levels were found to be highly correlated with birth weights in the (LGA) group, where the correlation co-efficient "r" equals 0.7648 and its corresponding P value was found to be statistically highly significant(P<0.01).

There was no correlation between serum fetal C-peptide levles and birth weights among the (AGA) and (SGA) groups (r=0.2514, r=0.1347 respectively as demonstrated in table 6).

The linear positive association for the relationship between serum fetal C-peptide levels and birth weights among the (LGA) group is presented in figure 7.

Table 1 :

Mean values ± SEM for fetal birth weight (kgms) and for maternal and fetal serum IGF-1 levels (nmol/L) in different studied groups

	LGA n=10	AGA n=10	SGA n=10
Birth weight	4.41±0.11	3.07±0.08	2.19±0.05
Maternal	26.7±4.0	21.4±3.5	17.3±1.6
Fetal	8.9±.080	5.7±1.0	4.4±1.0

SEM : Standard errors of the mean
n : Number of cases
LGA : Large for gestational age baby
AGA : Appropriate for gestational age baby
SGA : Small for gestational age baby

Table 2 :

Unpaired "t" test for testing the significance of difference between serum IGF-1 mean values of the different studied groups ..

		Maternal	
		AGA	SGA
LGA	t	0.997	2.182
	p	N.S.	<0.05
AGA	t		1.065
	p		N.S.
		Fetal	
		AGA	SGA
LGA	t	2.499	3.514
	p	<0.05	<0.01
AGA	t		0.919
	p		N.S.

N.S. Not Significant
<0.05 Significant
<0.01 Highly significant
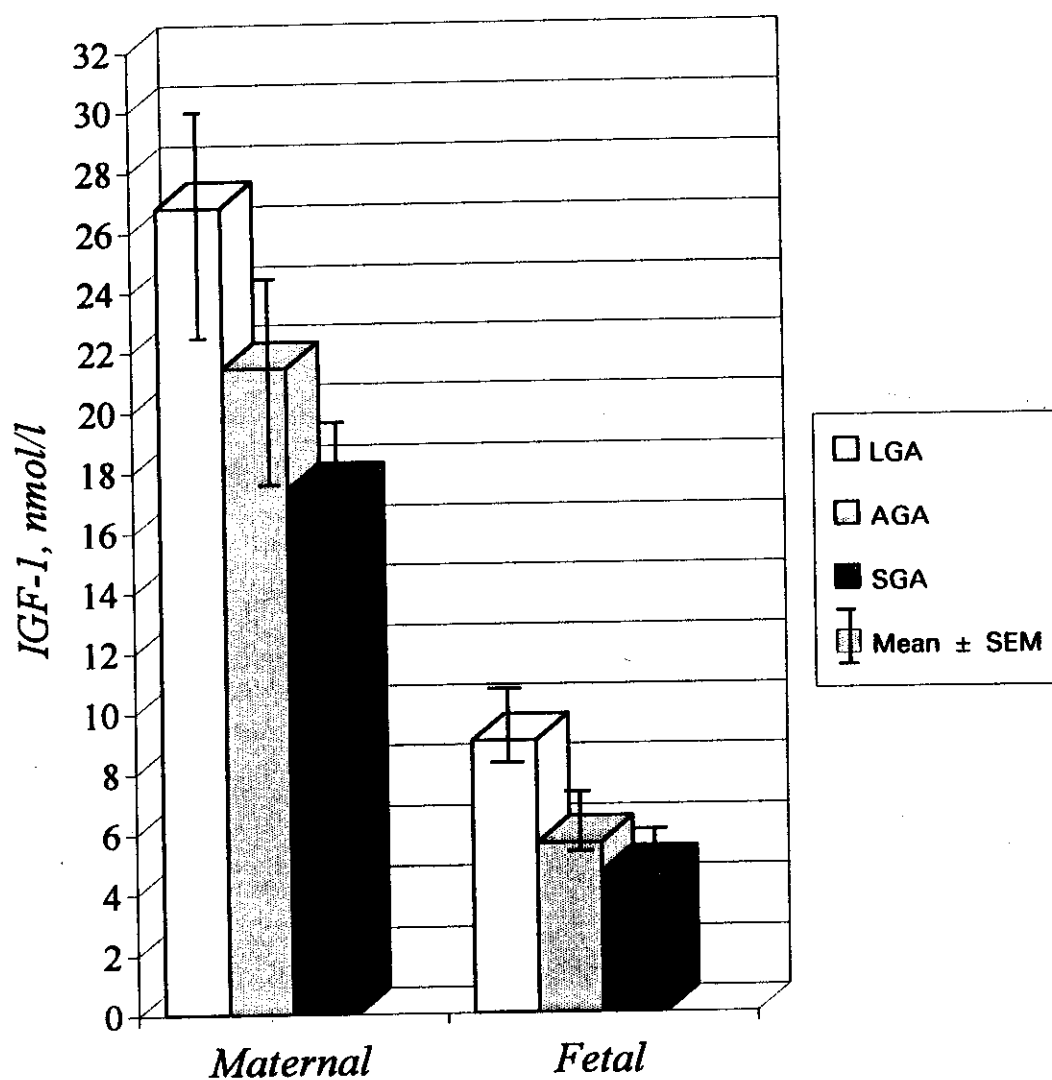<0.001 Very highly significant

Fig (1) :

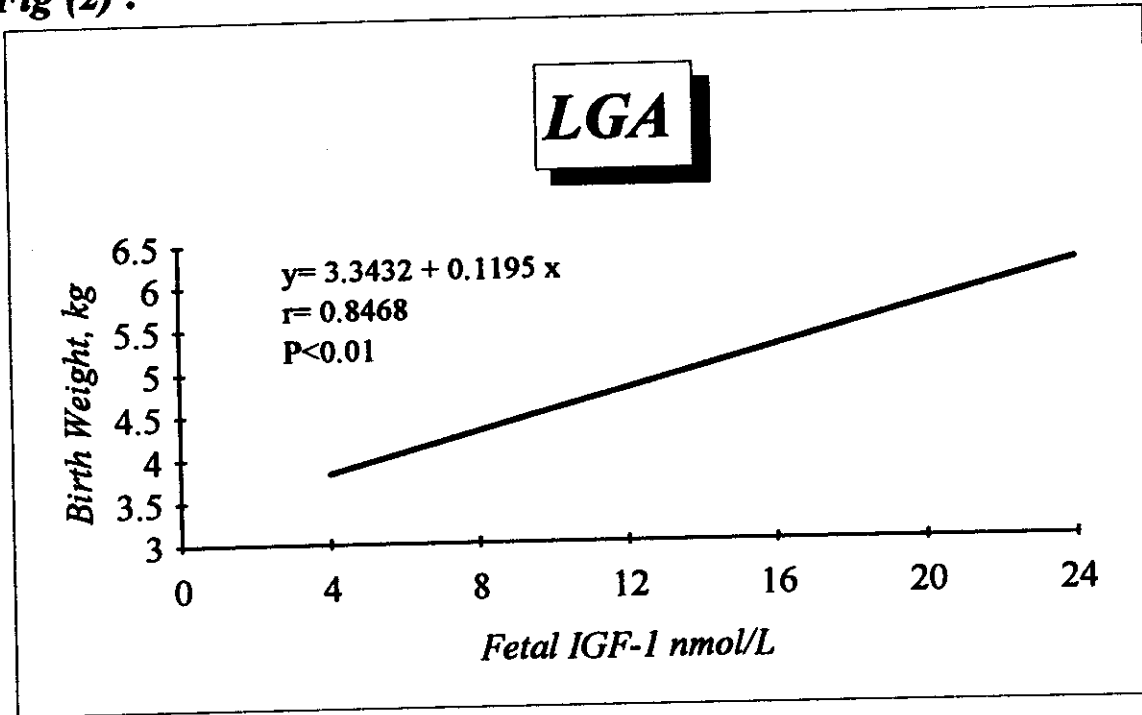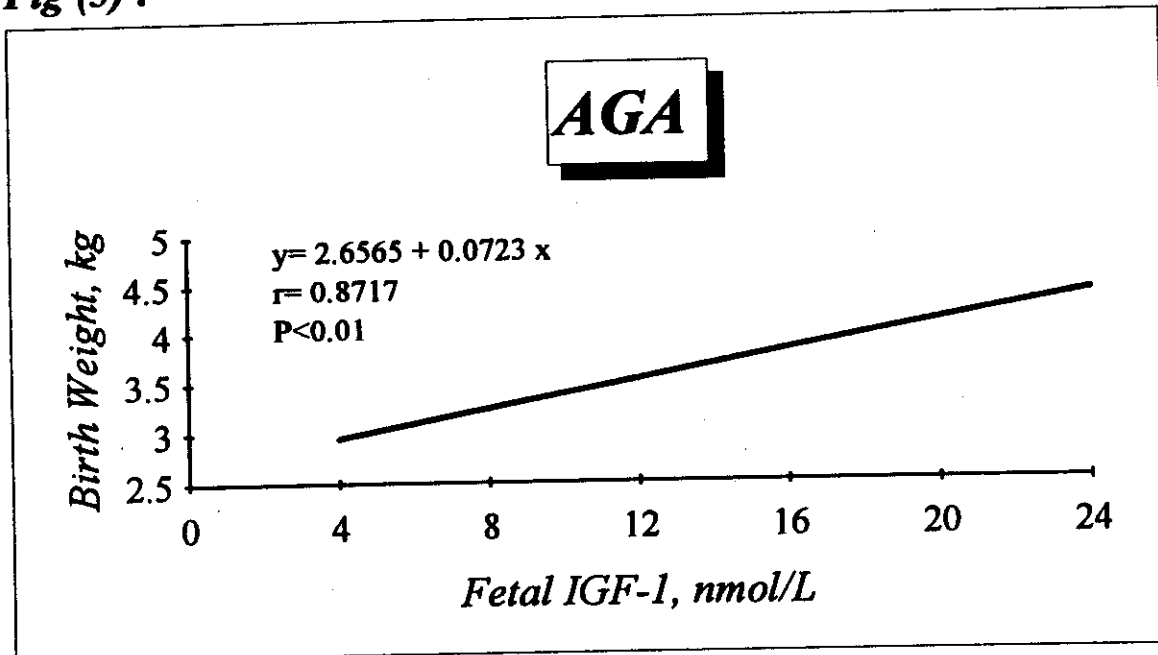Maternal and Fetal Serum IGF-1 mean values in different studied groups

Table 3 :

Correlation coefficient "r" between each of the individual values of maternal and fetal IGF-1 and between each of them and fetal birth weight in different studied groups

		LGA	
		Fetal	Birth Weight
Maternal	r	0.3897	0.0174
	p	N.S.	N.S.
Fetal	r		0.8468
	p		<0.01
		AGA	
		Fetal	Birth Weight
Maternal	r	-0.3994	-0.2179
	p	N.S.	N.S.
Fetal	r		0.8717
	p		<0.01
		SGA	
		Fetal	Birth Weight
Maternal	r	-0.4055	-0.1956
	p	N.S.	N.S.
Fetal	r		0.5788
	p		N.S.

Fig (2) :

LGA

$y = 3.3432 + 0.1195 x$
$r = 0.8468$
$P < 0.01$

Birth Weight, kg

Fetal IGF-1 nmol/L

Fig (3) :

AGA

$y = 2.6565 + 0.0723 x$
$r = 0.8717$
$P < 0.01$

Birth Weight, kg

Fetal IGF-1, nmol/L

Correlation coefficient "r" and regression line equation between the individual values of fetal IGF-1 and fetal birth weight in each of LGA and AGA group

Table 4 :

Mean values ± SEM for fetal birth (kgms) weight and for maternal and fetal serum C-peptide levels (ng/ml) in different studied groups

|	LGA n=10	AGA n=10	SGA n=10
Birth weight	4.41±0.11	3.07±0.08	2.19±0.05
Maternal	1.95±0.28	0.83±0.21	0.28±0.1
Fetal	1.01±0.29	0.64±0.16	0.30±0.10

Table 5 :

Unpaired "t" test for testing the significance of difference between serum C-peptide mean values of the different studied groups

		Maternal	
		AGA	SGA
LGA	t	3.200	5.617
	p	<0.01	<0.001
AGA	t		2.365
	p		<0.05
		Fetal	
		AGA	SGA
LGA	t	1.120	2.315
	p	N.S.	<0.05
AGA	t		1.802
	p		N.S.

Fig (4) :

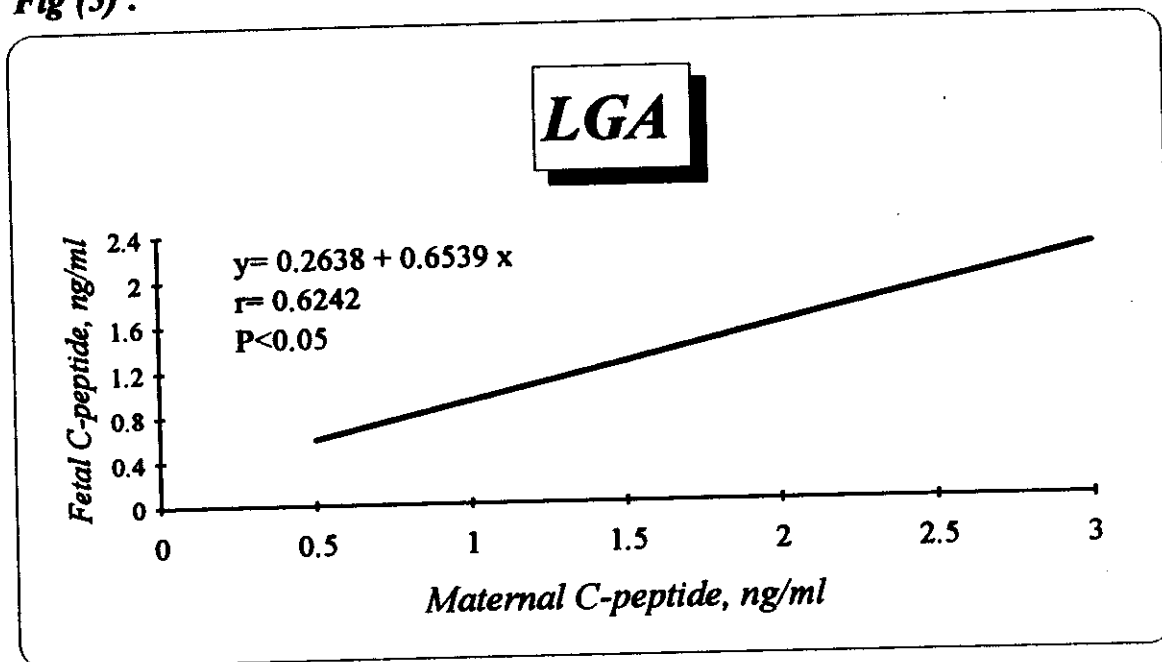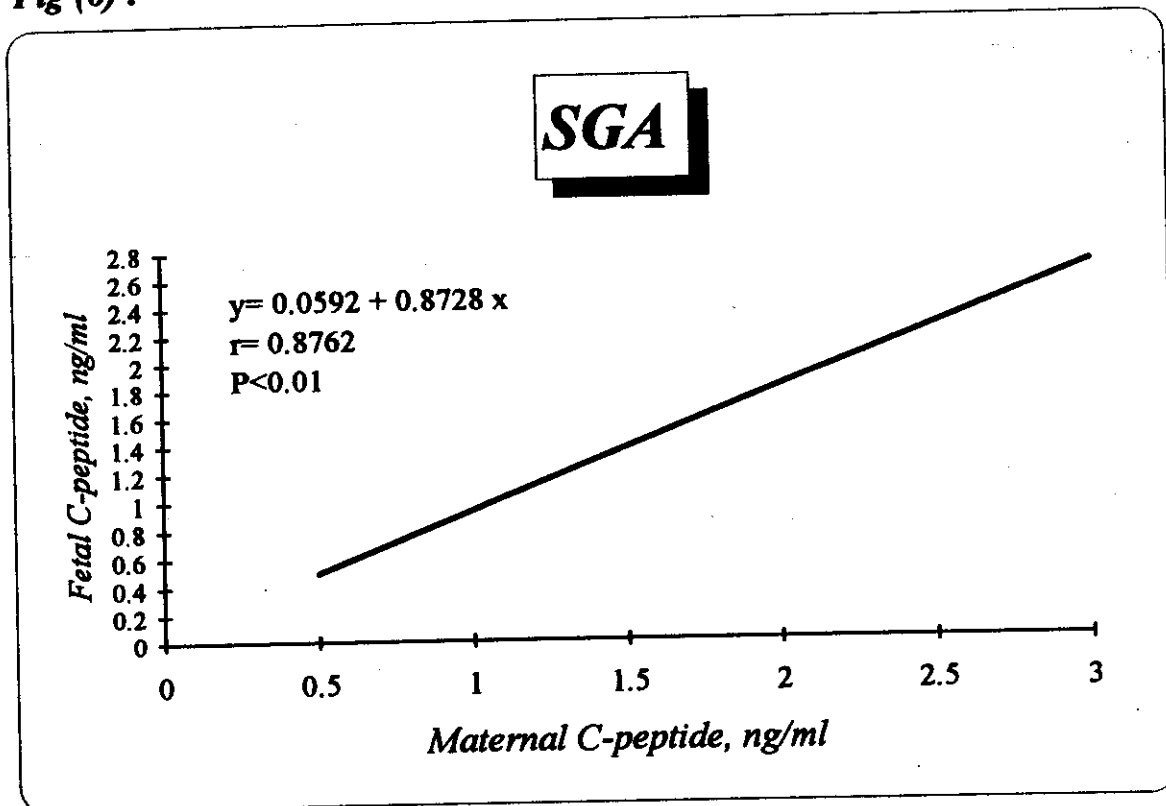Maternal and Fetal serum C-peptide mean values in different studied groups
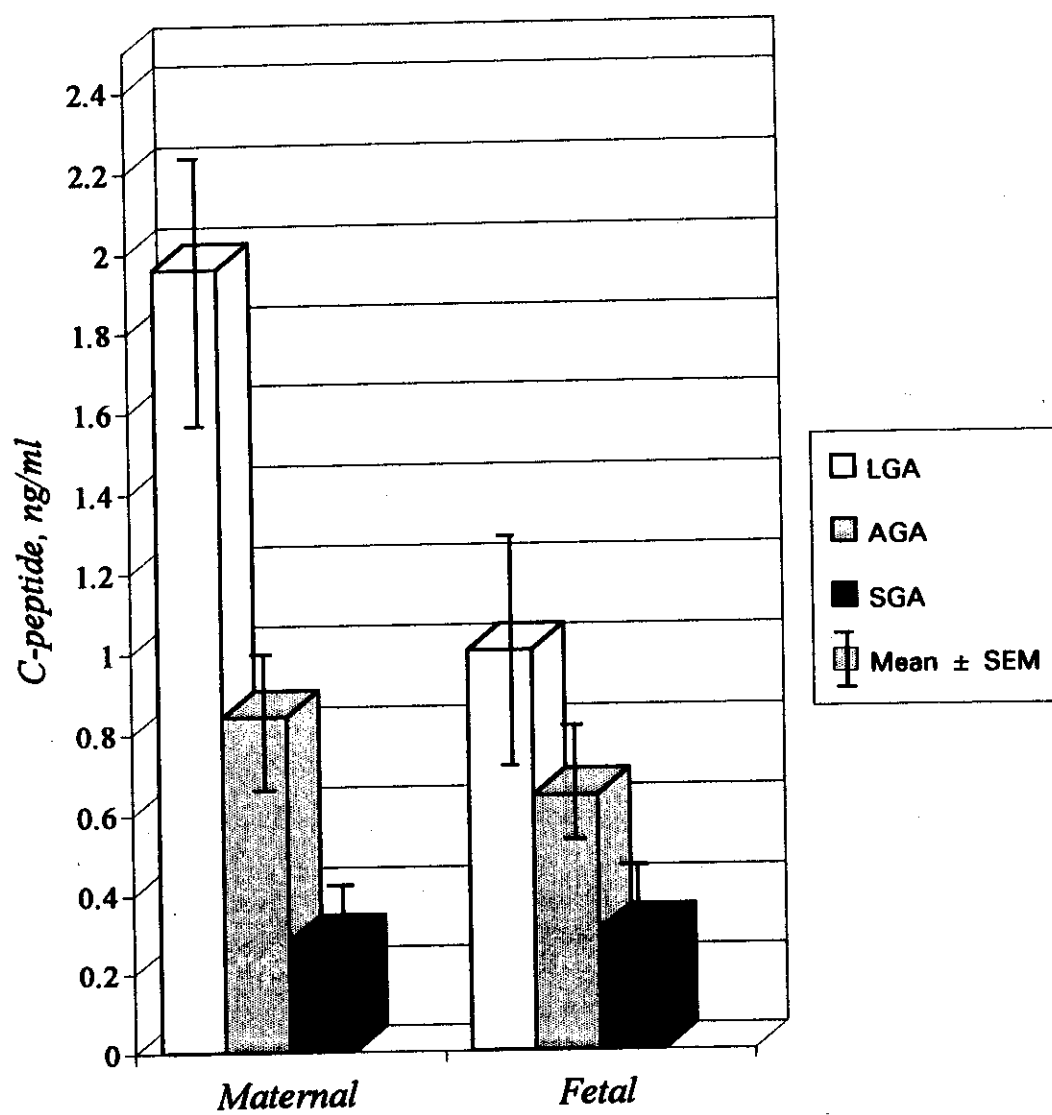
Table 6 :

Correlation coefficient "r" between each of the individual individual values of maternal and fetal C-peptide and between and fetal birth weight each of them in different studied groups classified according to fetal birth weight

		LGA	
		Fetal	Birth Weight
Maternal	r	0.6242	0.3649
	p	<0.05	N.S.
Fetal	r		0.7648
	p		<0.01
		AGA	
		Fetal	Birth Weight
Maternal	r	0.3617	0.3552
	p	N.S.	N.S.
Fetal	r		0.2514
	p		N.S.
		SGA	
		Fetal	Birth Weight
Maternal	r	0.8762	0.2738
	p	<0.01	N.S.
Fetal	r		0.1347
	p		N.S.

Fig (5) :

LGA

y= 0.2638 + 0.6539 x
r= 0.6242
P<0.05

Fetal C-peptide, ng/ml (y-axis: 0, 0.4, 0.8, 1.2, 1.6, 2, 2.4)

Maternal C-peptide, ng/ml (x-axis: 0, 0.5, 1, 1.5, 2, 2.5, 3)

Fig (6) :

SGA

y= 0.0592 + 0.8728 x
r= 0.8762
P<0.01

Fetal C-peptide, ng/ml (y-axis: 0, 0.2, 0.4, 0.6, 0.8, 1, 1.2, 1.4, 1.6, 1.8, 2, 2.2, 2.4, 2.6, 2.8)

Maternal C-peptide, ng/ml (x-axis: 0, 0.5, 1, 1.5, 2, 2.5, 3)
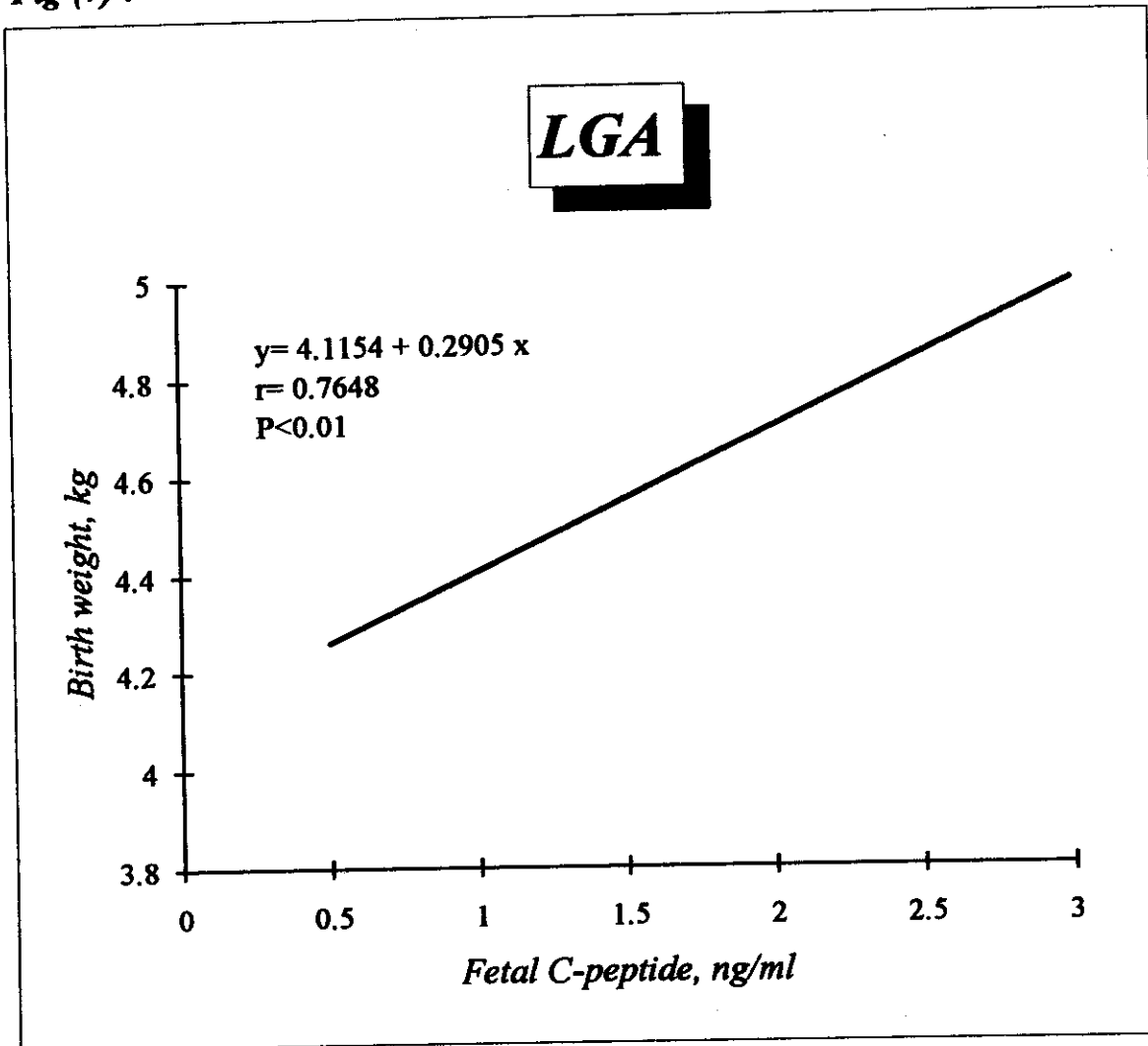
Correlation coefficient "r" and regression line equation between the individual values of maternal C-peptide and fetal C-peptide in each of LGA and AGA group

Fig (7) :

LGA

y= 4.1154 + 0.2905 x
r= 0.7648
P<0.01

Birth weight, kg (y-axis: 3.8, 4, 4.2, 4.4, 4.6, 4.8, 5)

Fetal C-peptide, ng/ml (x-axis: 0, 0.5, 1, 1.5, 2, 2.5, 3)

Correlation coefficient "r" and regression line equation between the individual values of each of fetal C-peptide and birth weight in LGA group