Results

This prospective study was conducted on sixty healthy primigravidae from antenatal outpatient clinics of Benha university hospital and Mansoura general hospital . Only fifty completed the study and investigations. TNF-α and IL-6 were assayed by ELISA to describe the changes in the concentrations from early ,mid and late pregnancy and the effect of age and BMI on cytokines levels. With any pregnancy complications additional sera samples were taken and complications were reported for correlations.

No one in the study group suffered from abortion or preterm labour . five patients suffered from preeclampsia ,two of them were severe preeclampsia . Mean gestational age of patients at the onset of preeclampsia was 34. 74+1.43 weeks (range: 34–40 weeks).

The results of our study are shown in the following tables and figures:

Table (1): The clinical characteristics of the study group (NO=50) (selected maternal factors) at booking.

Variant	Range	Mean ± S.D
Age(years)	19.00 - 40.00	26.9600 ± 4.79353
BMI (kg/m2)	20.8- 34.6	26.794 ± 3.1874
DBP(mmHg)	60 - 85	72.7 ± 8.281403
SBP(mmHg)	100 - 125	114.0816 ± 11.35018

NO=number of the study group

S.D= Stander Deviation

DBP=diastolic blood pressure

SBP=systolic blood pressure

Table (2): basic laboratory characteristics which may affect cytokines levels of the study group (NO=50).

	Range	**Mean ± S.D**	**R.R**
Monocyte (cells/ml)	.00 - 246.00	68.3125 ± 76.35782	100-8000
Esinophil (cells/ml)	.00 - 244.00	58.7200 ± 64.53983	≤700
Basophil (cells/ml)	.00 - 89.00	5.8367 ± 20.13222	≤100
Lymphocytes (cells/ml)	1200.00-3192.00	2146.3600 ± 486.78436	600-5000
TLC/ul	3.90 - 13.50	9.0143 ± 2.87359	4.0-10.0
PLT/ul	160.00 - 400.00	244.3400 ± 71.08104	150-450
RBC/ul	2.80 - 6.300	3.8961 ± 73637	4.2-5.4
Hb g/dl	8.00 - 13.40	11.2898 ± 1.08036	12-16 g/dl
Random Blood sugar mg/dl	68 -108	89.45 ± 16.263	≤ 140 mg/dl

R.R= Reference Range

Table (3) : Serum TNF-alpha and Serum IL-6 concentration (pg/ml) measured by ELISA in the first, second and third trimester among the study group(NO = 50) .

	TNF-α(pg/ml)			**IL-6**(pg/ml)		
	T1	**T2**	**T3**	**T1**	**T2**	**T3**
Range	15.80 –73.20	16.20 –73.60	18.2-149.2	13.60 – 39.60	14.40 - 47.90	14.8 – 132.3
Mean ± S.D	42.3020 ± 13.55454	42.8100 ± 13.57823	45.86 ± 17.607	22.3860 ± 25.9560	25.9560 ± 6.94709	36.4760 ± 10.32376
R.V	0.0-40 Pg/ml			0.0-24.5 pg/ml		

T1 = first trimester

T2= second trimester

T3=third trimester

R.V = Reference values

Table (4): Comparison of Serum TNF-α and IL6 in 1st and 2nd trimester among the study group (NO = 50) .

		Mean ± S.D	T	P
TNF-α (pg/ml)	**T1**	42.302 ± 13.5545	0.187	> 0.05 (N.S.)
	T2	42.810 ± 13.5782		
IL-6 (pg/ml)	**T1**	22.386 ± 5.5364	2.834	<0.05 (S)
	T2	25.956 ± 6.9471		

S= P<0.05=significant

N.S= p> 0.05=non significant

H.S=p<0.01=highly significant

TNF-α levels in 1st and 2nd trimester showed no statistically significant change p>0.05,Unlike IL-6 showed statistically significant increase in 2nd trimester in the study group P<0.05.

Table (5): comparison of Serum TNF-α and IL6 in 2nd and3 rd trimester among the study group (NO = 50) .

		Mean ± S.D	T	P
TNF-α (pg/ml)	**T2**	42.810 ± 13.5782	1.7	> 0.05 (N.S.)
	T3	45.86 ± 17.607		
IL-6 (pg/ml)	**T2**	25.956 ± 6.9471	3.9	<0.05 (S)
	T3	36.4760 ±10.32376		

TNF-α levels in 2nd and 3rd trimester showed no statistically significant change p>0.05 , Unlike IL-6 showed statistically significant increase in 3red trimester P<0.05.

Table (6): comparison of Serum TNF-α and IL6 in 1st and 3rd trimester among the study group (NO=50).

		Mean ± SD	T	P
TNFα (pg/ml)	**T1**	42.302 ± 13.5545	1.9	> 0.05 (N.S.)
	T3	45.86 ± 17.607		
IL-6 (pg/ml)	**T1**	22.386 ± 5.5364	4.2	<0.05 (S)
	T3	36.4760 ± 10.32376		

TNF-α levels in 1st and 3rd trimester showed no statistically significant change p>0.05 ,Unlike IL-6 showed statistically significant increase in 3red trimester P<0.05 .

Table (7) : TNF-α and IL6 levels in non complicated pregnant women (NO=45)and pregnancy complicated by pre- eclampsia (NO=5) in 1st ,2nd and 3 rd trimester (pg/mL) in the study group.

			Mean± S.D	T	P
TNF-α	T1	Non complicated	42.3 ± 13.62	0.8	>0.05
		Complicated	47.14 ± 13.3116		
	T2	Non complicated	42.8 ±13.6277	1.1	>0.05
		Complicated	48.9 ±12.7851		
	T3	Non complicated	45.86 ±16.146	3.1	<0.01
		complicated	86.76 ±11.3		
IL-6	T1	Non complicated	21.85 ±4.9025	1.3	>0.05
		complicated	27.14 ±8.9279		
	T2	Non complicated	24.93 ±5.8956	3.5	<0.05
		complicated	35.16 ±9.5505		
	T3	Non complicated	28.14 ±10.4	8.7	<0.01
		complicated	111.4 ±21.05		

Preeclampsia had been developed in 5 out of 50 patients (10%). No statistically difference was found in serum TNF-α levels between groups

in the first and second trimesters (P>0.05) ,but TNF-α was statistically highly increased in third trimester in preeclampsia than in normal pregnant women P<0.01, unlike IL-6,women complicated by preeclampsia had a statistically increased serum IL-6 levels than non complicated pregnant women in the second $p < 0.5$ and third trimesters $p < 0.01$.

Figure (1) : serum concentration of **TNFα** in non complicated pregnant women and pre- eclamptic pregnant women in 1st ,2nd and 3 rd trimester

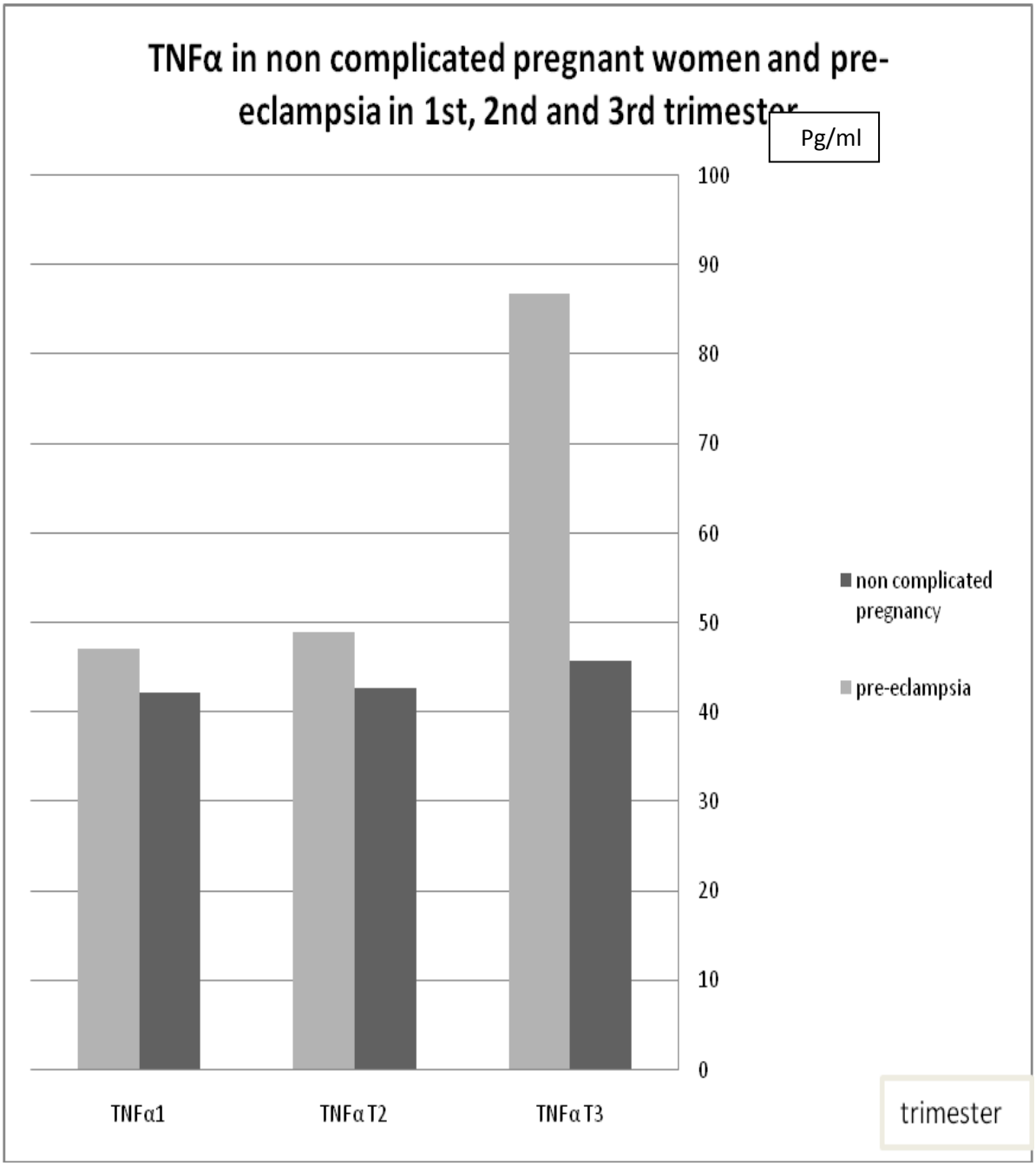


Figure (2) : serum concentration of **IL-6** in non complicated pregnant women and pre- eclamptic pregnant women in 1st ,2nd and 3 rd trimester .

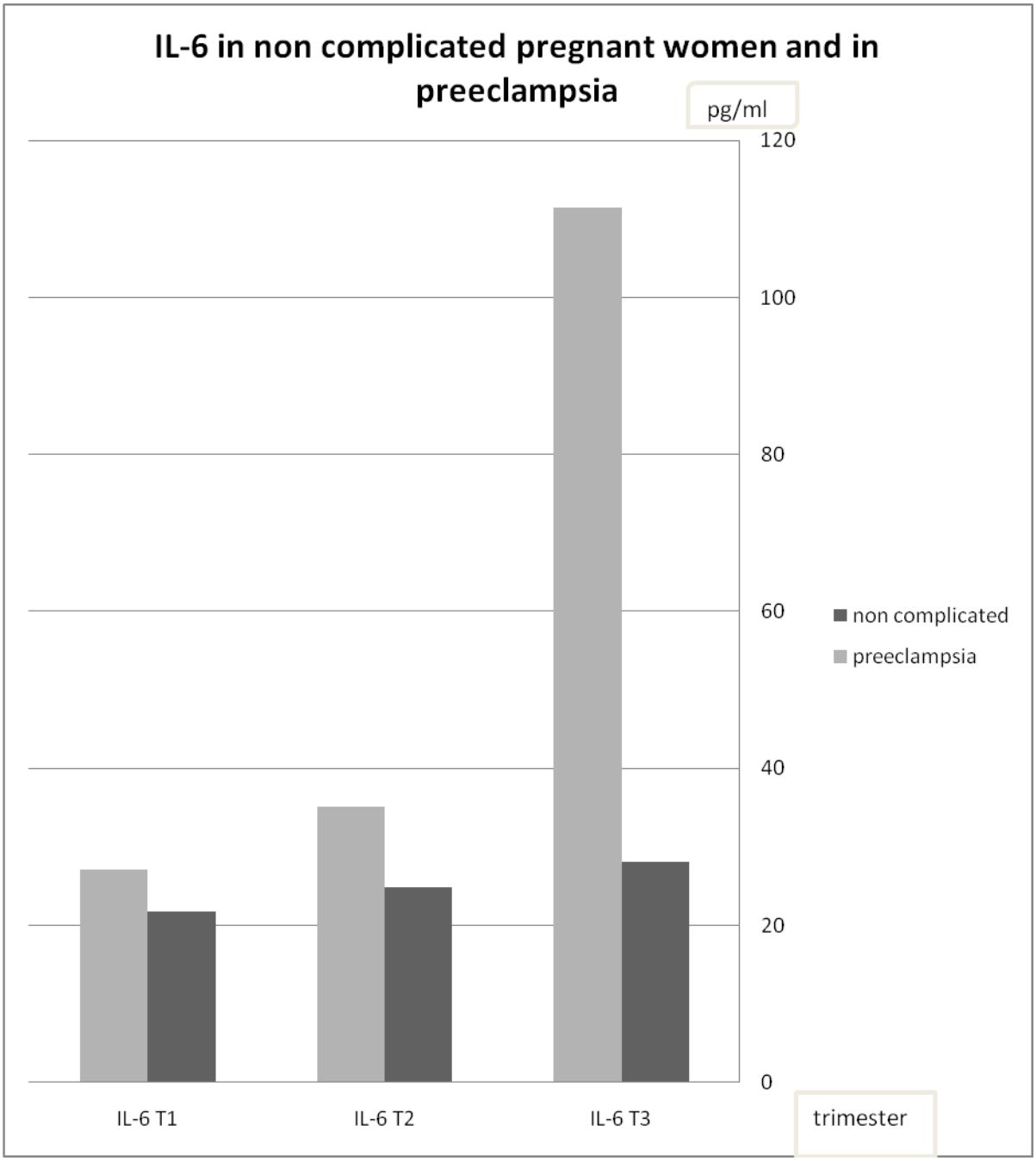


Table (8) : Correlation between TNF-α 1st trimester and different maternal variables.

variables	**TNF-α T1**(Mean 42.3020 ±13.55454)		
	R	P	(No)
Age(years)	0.66	0.000	50
BMI(kg/m2)	0.1	0.7	50

TNF-α levels were strongly correlated with age in early- pregnancy P <0.01,but no correlation between TNF-α 1st trimester and BMI (*P*>0.05).

Figure (3) : the correlation between TNF-α 1st trimester and the age.

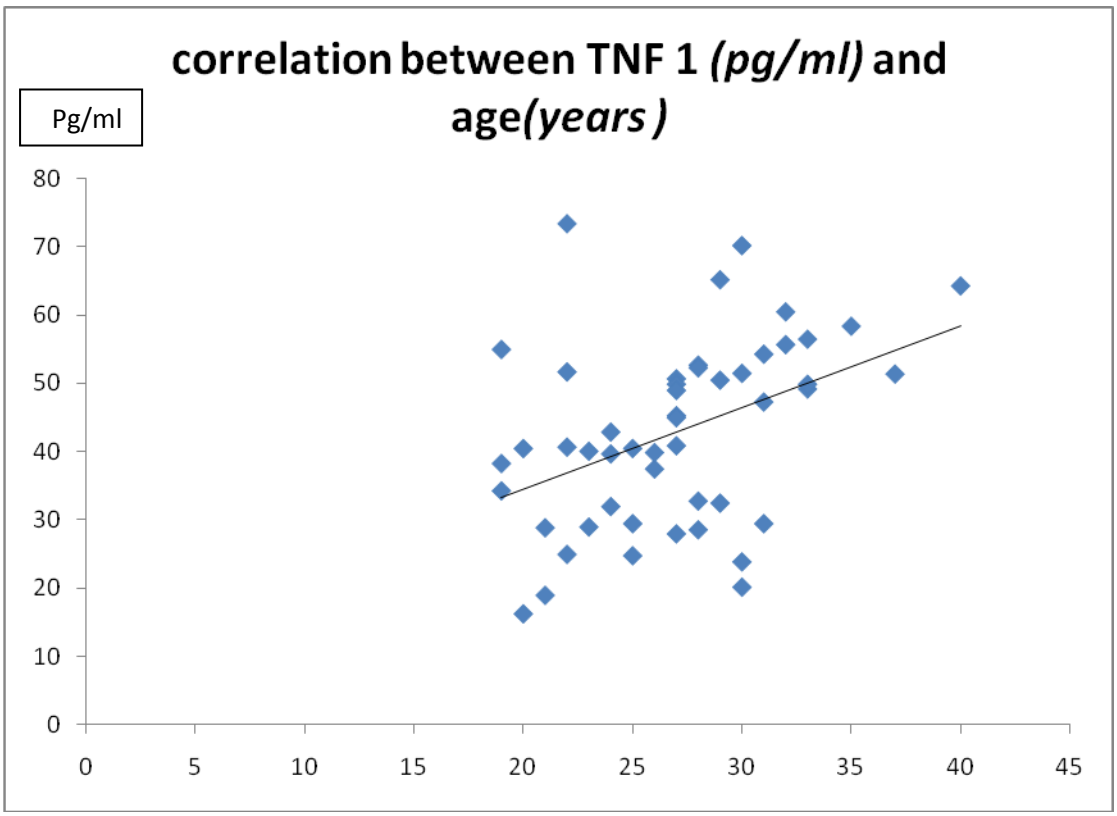
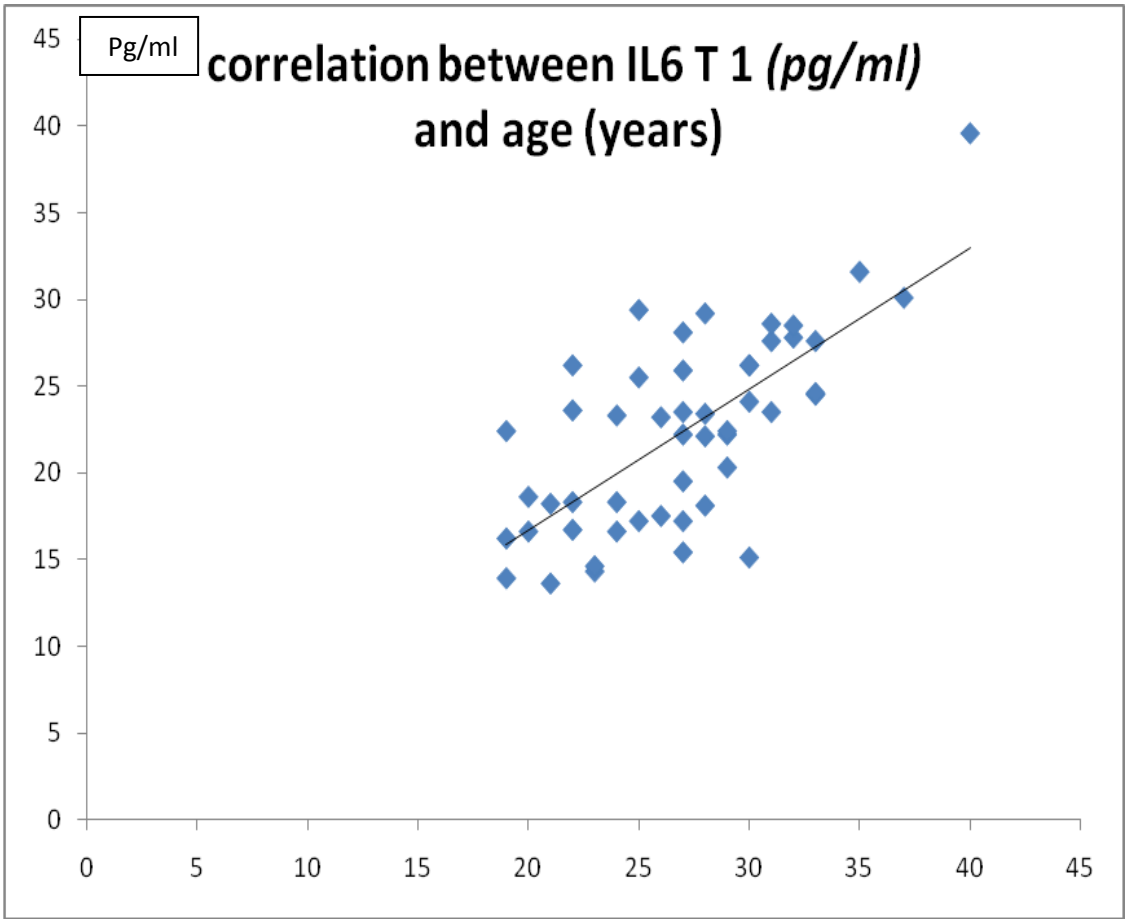


Table (9) : correlation between IL-6 in 1st trimester and different maternal variables.

NO(50)	IL-6T1 (Mean 22.3860 ± 5.53637)	
	r	p
Age(years)	0.704	0.000
BMI(kg/m2)	0.2	0.3

IL-6 levels were strongly correlated with age in early pregnancy P<0.01 ,but no correlation between IL-6 1st trimester and BMI(*P*>0.05) .

Figure (4) : correlation between IL-6in 1st trimester and the age.



Table(10): Correlation between TNF-α 1st trimester and the other cytokines levels at different gestational ages.

NO(50)	TNF-α T1	
	r	P
TNF-α T2	0.51	0.000
TNF-T3	0. 69	0.000
IL-6T1	0.63	0.000
IL-6T2	0.25	0.07
IL-6T3	0.3	0.06

TNF-α levels were strongly correlated with IL-6 levels in early-pregnancy and TNF -α 2nd and 3rd trimester (p values <0. 01) but no correlation between TNF-α 1st trimester and IL-6 level in in2nd or 3rdtrimester (P >0.05) .

Table(11) Correlation between TNF-α 2nd trimester and the other cytokiens levels at different gestational ages.

NO(50)	TNF-α T2	
	r	P
TNF-α T1	0.51	0.000
TNF-α T3	0.69	0.000
IL-6T1	0.42	0.000
IL-6T2	0.27	0.06
IL-6T3	0.29	0.06

TNF-α 2nd trimester levels were strongly correlated with IL-61st , TNFα1st and 3rd trimester (p <0. 01) but no correlation

between TNF-α 2nd trimester and IL-6 level in in2nd or 3rd trimester (P >0.05) .

Table(12) Correlation between IL-6in 1st trimester and the other cytokiens levels at different gestational ages.

NO(50)	IL-6T1	
	r	P
TNF-αT1	0.63**	0.000
TNF-α T2	0.42**	0.000
TNF-α T3	0.4	0.004
IL-6T2	0.37**	0.009
IL-6T3	0.57	0.000

There is positive correlations between IL-6 levels in 1st trimester and the TNF-α 1st in2nd and 3rd trimester and IL-6 level in in2nd trimester (p <0. 01) .

Table(13)the correlation between IL-6 2nd trimester and the other cytokiens levels at different gestational ages.

No(50)	IL-6T2	
	r	p
TNF- α T1	0.25	0.07
TNF- α T2	0.27	0.06
TNF-αT3	0.2 4	0.07
IL-6 T1	0.37	0.009
IL-6 T3	0.64	0.000

There is positive correlations between IL-6 levels in 2nd trimester and il-6 1st and 3rd trimester but no correlations with TNF-α 1st in2nd or 3rd trimester and IL-6 level in in2nd trimester (P >0.05)