# *Results*

This work have been done on 60 pregnant women they were delivered into 3 groups :

*The first group :*

included 20 fullterm pregnant ladies ≥ 38 weeks with no medical and obstetric complications.

*The second group :*

included 20 pregnant ladies less than 37 weeks in active preterm labour.

*The third group :*

included 20 pregnant ladies with prelabour spontaneous rupture of membranes.

The results were as follows :

*Table (1)*

Represents the clinical data of all the patients in the study groups. They were all matched with no significant difference.

*Table (2)*

Represents serum calcium level, serum magnesium level, serum zinc level and serum copper level in full term pregnant ladies with no medical or obstitric complications and those with preterm labour :

When we compared serum calcium level, serum magnesium level and serum zinc level in both groups there were a significant drop in their levels in cases of preterm labour (P < 0.05) but there was non significant change in the serum copper level between both groups (P > 0.05).

There was also non significant correlation between serum zinc level and serum copper level in cases of preterm labour.

**Table (3)**

Represents serum calcium level, serum magnesium level, serum zinc level and serum copper level in full term pregnant ladies with no medical or obstetric complications and those with prelabour spontaneous rupture of membranes (P.S.R.O.M).

When we compared serum calcium level, serum magnesium level, serum zinc level and serum copper level in both groups there were significant drop (P < 0.05) in their levels in cases of (P.S.R.O.M).

There was also nonsignificant correlation between serum zinc level and serum copper level in full term group (P > 0.05) and also there was no significant correlation between their levels in cases of P.S.R.O.M. (P > 0.05).

**Table (4)**

Represent serum calcium level, serum magnesium level, serum zinc level and serum copper level in ladies with preterm labour and those with prelabour spontaneous rupture of membranes (P.S.R.O.M) :

When we compared serum calcium levels in both groups there was nonsignificant changes (P > 0.05).

When we compared serum magnesium level in both group there was significant drop in serum magnesium level in cases of preterm labour (P<0.05).

When we compared serum zinc level and serum copper level in both group there were nonsignificant change (P > 0.05).

**Table (5)**

Represents fetal membrane calcium, fetal membrane magesium, fetal membrane zinc and fetal membrane copper in full term pregnant ladies with no medical, obstitric complications and those with prelabour spontaneous rupture of membranes (P.S.R.O.M).

When we compared fetal membrane calcium in both groups there was significant drop in calcium level (P < 0.05) in cases of P.S.R.O.M.

When we compared fetal membrane magnesium in both group also there was a singificant drop (P < 0.05) in cases of P.S.R.O.M.

When we compared fetal membrane zinc both group there was nonsignificant changes (P > 0.05).

When we compared fetal membrane copper in both group there were significant increase in cases of P.S.R.O.M. (P < 0.05).

There was also nonsignificant correlation between fetal membrane zinc and fetal membrane copper (P > 0.05) in full term cases.

There was singinicant correlation between fetal membrane zinc and fetal membrane copper in P.S.R.O.M (P < 0.05).

## Table (1)

Clinical data (age, parity, gravidity, duration of pregnancy) in the three groups.

| Clinical data Group | Age (years) | Parity | Gravidty | Duration of pregnancy (weeks) |
|---|---|---|---|---|
| **Group I** | | | | |
| - Range | 20 - 30 | 0 - 5 | 1 - 7 | - |
| - Mean | 26.6 ± 3.4 | 1.8 ± 1.98 | 2.8 ± 1.96 | ± 40 weeks |
| **Group II** | | | | |
| - Range | 20 - 34 | 0 - 5 | 1 - 7 | 28 - 36 |
| - Mean | 27.1 ± | 2 ± 1.9 | 3.2 ± 2.1 | 33.8 ± 2.5 |
| - P. | 4.06 | > 0.05 | > 0.05 | > 0.05 |
| | > 0.05 | | | |
| **Group III** | | | | |
| - Range | 20 - 32 | 0 - 6 | 1 - 7 | ± 40 weeks |
| - Mean | 26.1 ± | 2.1 ± 2.2 | 3.1 ± 2.2 | 33.6 ± 2.1 |
| - $P_1$ | 4.03 | > 0.05 | > 0.05 | > 0.05 |
| | > 0.05 | | | |

P    Full term versus preterm labour (P.T.L)

$P_1$    Full term versus P.S.R.O.M

P > 0.05 nonsignificant

P < 0.05 significant

## Table (2)

Serum calcium level, serum magnesium level, serum zinc level and serum copper level in full term pregnant ladies and preterm labour.

| Serum level<br><br>Group | Serum calcium (mg/dl) | Serum magnesium (mg/dl) | Serum zinc (µg/ml) | Serum copper (µg/ml) |
|---|---|---|---|---|
| Group I<br>  - Range<br>  - Mean | 8.6 - 11.2<br>9.6 ± 0.74 | 1.5 - 2.6<br>2.02 ± 0.28 | 0.23 - 0.82<br>0.4 ± 0.19 | 1.23 - 3.5<br>2.4 ± 0.56 |
| Group II<br>  - Range<br>  - Mean | 7.2 - 11.1<br>8.8 ± 0.12 | 1.04 - 2.3<br>1.7 ± 0.41 | 0.091 - 0.351<br>0.22 ± 0.09 | 1.53 - 2.86<br>2.1 ± 0.42 |
| - t<br>- P<br>- r<br>- p | 2.56<br>< 0.05 | 2.81<br>< 0.05 | 4.02<br>< 0.05 | 1.75<br>> 0.05<br>0.057<br>> 0.05 |

$P < 0.05$ significant.

$P > 0.05$ nonsignificant.

## Table (3)

Serum calcium level, serum magnesium level, serum zinc level and serum copper level in full term pregnant ladies and prelabour spontaneous rupture of membranes (P.S.R.O.M.).

| Serum level<br><br>Group | Serum calcium (mg/dl) | Serum magnesium (mg/dl) | Serum zinc (µg/ml) | Serum copper (µg/ml) |
|---|---|---|---|---|
| **Group I** | | | | |
| - Range | 8.6 - 11.2 | 1.5 - 2.6 | 0.23 - 0.82 | 1.23 - 3.5 |
| - Mean | 9.6 ± 0.74 | 2.02 ± 0.28 | 0.4 ± 0.19 | 2.4 ± 0.56 |
| - ٢ | | • | $\leftarrow$ 0.236 $\rightarrow$ | |
| - P | | | $>$ 0.05 | |
| **Group III** | | | | |
| - Range | 7.2 - 1.02 | 1.02 - 2.1 | 0.172 - 0.587 | 1.54 - 2.28 |
| - Mean | 8.6 ± 0.96 | 1.4 ± 0.47 | 0.28 ± 0.14 | 1.9 ± 0.22 |
| - t | 3.68 | 5.23 | 2.41 | 3.54 |
| - P | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| - r | | | $\leftarrow$ 0.041 $\rightarrow$ | |
| - p | | | $>$ 0.05 | |

## Table (4)

Serum calcium level, serum magnesium level, serum zinc level and serum copper level in cases of preterm labour and cases of prelabour spontaneous rupture of membranes (P.S.R.O.M.).

| Serum level / Group | Serum calcium (mg/dl) | Serum magnesium (mg/dl) | Serum zinc (µg/ml) | Serum copper (µg/ml) |
|---|---|---|---|---|
| Group II - Mean | 8.8 ± 1.2 | 1.7 ± 0.41 | 0.22 ± 0.09 | 2.1 ± 0.42 |
| Group III - Mean | 8.6 ± 0.96 | 1.4 ± 0.47 | 0.28 ± 0.14 | 1.9 ± 0.22 |
| - t | 0.55 | 2.32 | 1.68 | 1.91 |
| - P | > 0.05 | < 0.05 | > 0.05 | > 0.05 |

## Table (5)

Fetal membrane (calcium), fetal membrane magnesium, fetal membrane zinc and fetal membrane copper in full term pregnant ladies and cases of prelabour spontaneous rupture of membranes (P.S.R.O.M.).

| Fetal membrane Group | Fetal membrane calcium (mg/100 mg) | Fetal membrane magnsium (mg/100 mg) | Fetal membrane zinc (µg/100mg) | Fetal membrane copper (µg/100mg) |
|---|---|---|---|---|
| Group I | | | | |
| - Range | 0.11 - 0.24 | 0.05 - 0.15 | 0.5 - 2.1 | 1.66 - 7.6 |
| - Mean | 0.2 ± 0.05 | 0.1 ± 0.03 | 0.9 ± 0.47 | 0.3 ± 0.16 |
| - r | | | | 0·180 |
| - p | | | | > 0·05 |
| Group III | | | | |
| - Range | 0.08 - 0.23 | 0.02 - 0.09 | 0.04 - 1.1 | 0.280 - |
| - Mean | 0.14 ± 0.04 | 0.05 ± 0.02 | 0.75 ± 0.21 | 0.714 |
| | | | | 0.43 ± 0.08 |
| - t | 3.65 | 6.22 | 1.27 | 5.35 |
| - P | < 0.05 | < 0.05 | > 0.05 | < 0.05 |
| - r | | | | 0·487 |
| - p | | | | < 0·05 |

# *Discussion*

Our study concerns with the role of maternal serum levels of calcium, magnesium, copper and zinc in preterm labour and prelabour spontaneous rupture of membranes as well as their content in fetal membranes in the second group compared with the control group.

In our study we found that there was a singificant decrease in serum calcium in cases of preterm labour and prelabour spontaneous rupture of membranes compared with the control group.

This agree with Jose et al., (1991) who found that calcium supplementation may significantly reduce preterm labour in high risk population. They did not explain this by direct effect on the uterine extra cellular ionized calcium but they suggest that high calcium may reduce the level of parathyroid hormon (P.T.H) thus lowering intracellular free calcium and increases smooth muscle relaxation.

As regard serum magnesium we found a significant decrease in serum magnesium level of preterm labour and prelabour spontaneous rupture of membranes compared with the control group. This was agreed with (Kurzel, 1991) who stated that hypomagnesemia (1.4 mg/dl) may be a marker for preterm labour. Ricci et al., (1991) concluded that orally administered magnesium chloride is effecitive in prevention of preterm labour.

However there was dysagreement as regard serum magnesium level in prelabour spontaneous rupture of membranes. He found that its level was not depressed.

In another study (Rick et al., 1992) proved that prophylactic magnesium had no effect on the duration of pregnancy or infant birth weight. In contrast spalting (1988) reported significant lower preterm labour with magnesium supplementation during pregnancy.

Zinc is an element involved either directly as a metalloenzyme which includes DNA and RNA polymerase or as a catalyst in the synthesis of other enzymes. It affects growth, development and reproduction. Although the requirement for absorbed zinc increases with pregnancy (0.75 mg/dl after 20 weeks). There is no evidence that absorption efficiency is also increases (Swanson and King, 1978). They also suggest that zinc is invloved in prostaglandin synthesis as well as in synthesis and degradation of collagen.

The influence of dietary zinc on pregnancy outcome have been studied by (Scholl et al., 1993) and proved that low zinc intake associated with three fold increase in the risk of low birth weight and preterm labour. Neggers et al., (1990) reported a significant linear relation between duration of gestation and plasma zinc concentration.

Sikorski et al., (1990) reported decrease in the mean ± S.D value of maternal zinc index in patient with premature rupture of membranes. Compared with patient without this complication. They proved also inverse relationship between maternal serum zinc index and parity (r = 0.61 , P = 0.04), This suggest that subnormal tissue zinc content in pregnancy may play a role as a causative factor in prelabour spontaneous rupture of membranes.

This is agreement with our study, we have found that there was a significant decrease in serum zinc in cases of preterm labour and prelabour spontaneous rupture of membranes when compared with the control group. But in contrast we did not find a significant relationship between maternal serum zinc and parity (r = 0.23 , P = 0.33).

Mechanisms responsible for decrease in serum zinc level is not clearly understood and remain elucidated. Presumply the decrease in plasma zinc reflects in part the uptake of zinc by the fetus and other products of conception resulting in a conditioned zinc deficiency. Giroux et al., (1976) explained this by decrease in the serum albumen, albumen bound zinc and $a_2$ macroglobulin bound zinc.

Another study by Henkin et al., (1971) reported that decrease serum zinc with increasing gestation was due to increase oestrogen production increase zinc uptake by fetus, placenta, increase tranfere of plasma zinc to maternal erythrocyte.

Copper deficiency has been shown to inhibit maturation of collagen and elastin other studies proved that copper deficiency diet could result in an increased fragility of different structures (Evans, 1973).

Henkin et al., (1971) demonstrated higher serum copper level in pregnancy, patient with prelabour spontaneous rupture of membranes have been found to have significant lower progesterone and estradiol levels.

Low serum copper in patient with prelabour spontaneous rupture of membranes could significant impair the maturation of collagen and elastin. This may lead to reduced elastin content leading to thining out of the membranes at the rupture site Artal et al., (1976).

Serum copper level in patient with prelabour spontaneous rupture of membranes have been studied by Artal et al., (1990) he found that serum copper levels were significantly lower in cases of prelabour spontaneous rupture of membranes compared with control group. This agree with our study we found that there is a singificant decreases in cases of prelabour

spontaneous rupture of membranes regarding serum copper compared with control group. Also Fa-YH (1989) proved that study.

But we found nonsignificant changes in serum copper in cases of preterm labour compared with fullterm.

As regard the other side of our work is that the level of these trace elements in fetal membranes in cases of prelabour spontaneous rupture of membranes comparing them with control group, there were significant decrease in fetal membrane calcium and magnesium in cases of prelabour spontaneous rupture of membranes compared with control.

Kidroni et al., (1989) studied the membrane of normal term pregnancies and prematurely ruptured amniotic membranes. The membranes were analysed for neutral sugars, hexosomine, sialic acid, DNA, RNA, cholesterol, phospholipids, calcium magnesium, sodium and potasium. The only significant difference was found in calcium and magnesium. There was significant decrease in both elements in cases of prelabour spontaneous rupture of membranes.

As regard fetal membrane zinc we found nonsignificant changes between both groups.

As regard fetal membrane copper in our study we found that there was a significant decrease in fetal membrane copper in control than prelabour spontaneous rupture of membranes. In contrast to our findings Fa-YH, (1989) found a significant decrease in fetal membrane copper of prelabour spontaneous rupture of membranes compared with controls. But this may be explained by a greater number of cases he examined he collected about 60 patient of the first group and 20 of control or second group. So our samples may be not enough to reach this results. On the other hand Artal et al., (1987) suggest that there is no significant difference between fetal membranes copper in the control or fullterm rupture membranes and prelabour spanteneous rupture of membranes.

# *Summary and Conclusion*

In this study Blood samples were collected from 60 women and their serum were analysed for detection of calcium, magnesium, copper and zinc levels. The cases divided into three group each consist of 20 cases.

First group of 20 pregnant women came to the hospital in labour at full term with no association of any medical disorder and served as control group, second group 20 cases of pregnant women complaining of preterm labour and the third group 20 cases of pregnant women with prelabour spontaneous rupture of membranes.

The level of those trace elemets were also analysed in the fetal membranes of the first and third groups. We found that :

There were a significant decrease in the maternal serum levels of calcium, magnesium, zinc and copper in cases of prelabour spontaneous rupture of membranes compared with the control group.

We found also a significant decrease in maternal serum calcium level, serum magnesium level, serum zinc level in cases of preterm labour as compared with fullterm group, but when we compared serum copper level in both groups we found nonsignificant change.

As regard fetal membranes's calcium, magnesium, there were a significant decrease in cases of prelabour spontaneous rupture of membranes compared with the control group. But when we compared fetal membrane zinc in both groups there was nonsignificant change.

In our study also we found a significant increase in fetal membrane's copper in prelabour spontaneous rupture of membranes compared with the control.

## Master Sheets
### (1) Full term (serum levels) G P I

| No. of case | Age (years) | Gracidty / parity | Calcium mg/dl | Magnesium mg/dl | zinc µg/ml | Copper µg/ml |
|---|---|---|---|---|---|---|
| 1 | 23 | $G_1P_0$ | 11.2 | 2.6 | 0.41 | 3.5 |
| 2 | 25 | $G_1P_0$ | 8.7 | 1.8 | 0.31 | 2.87 |
| 3 | 23 | $G_1P_0$ | 11 | 1.5 | 0.27 | 2.46 |
| 4 | 24 | $G_2P_1$ | 9 | 1.8 | 0.345 | 1.84 |
| 5 | 26 | $G_1P_0$ | 10 | 2.7 | 0.345 | 2.05 |
| 6 | 30 | $G_6P_6$ | 8.5 | 1.8 | 0.41 | 1.23 |
| 7 | 29 | $G_5P_4$ | 9.7 | 2.04 | 0.81 | 2.85 |
| 8 | 28 | $G_3P_2$ | 9.8 | 2.1 | 0.33 | 2.45 |
| 9 | 23 | $G_1P_0$ | 9.4 | 1.9 | 0.42 | 1.65 |
| 10 | 30 | $G_4P_3$ | 9.1 | 2.3 | 0.32 | 2.67 |
| 11 | 26 | $G_2P_1$ | 10.1 | 2.2 | 0.379 | 1.85 |
| 12 | 25 | $G_4P_3$ | 9.8 | 1.9 | 0.345 | 2.25 |
| 13 | 23 | $G_2P_1$ | 10.3 | 1.8 | 0.138 | 1.64 |
| 14 | 28 | $G_1P_0$ | 9.5 | 1.7 | 0.31 | 2.26 |
| 15 | 32 | $G_4P_3$ | 9.3 | 2.1 | 0.82 | 2.46 |
| 16 | 30 | $G_2P_1$ | 9.2 | 2.1 | 0.69 | 3.08 |
| 17 | 33 | $G_6P_5$ | 8.8 | 2.03 | 2.24 | 2.46 |
| 18 | 20 | $G_7P_6$ | 8.6 | 1.9 | 0.23 | 2.43 |
| 19 | 28 | $G_2P_1$ | 10.2 | 2.03 | 0.68 | 3.07 |
| 20 | 27 | $G_1P_0$ | 9.9 | 2.02 | 0.41 | 2.46 |

## (2), Full term (fetal membrane levels) Gp I

| No. of case | Age (years) | Gracidty / parity | Calcium mg/dl | Magnesium mg/dl | zinc µg/ml | Copper µg/ml |
|---|---|---|---|---|---|---|
| 1 | 23 | $G_1P_0$ | 0.23 | 0.05 | 0.5 | 2.1 |
| 2 | 25 | $G_1P_0$ | 0.29 | 0.11 | 0.6 | 1.66 |
| 3 | 23 | $G_1P_0$ | 0.15 | 0.12 | 0.6 | 1.66 |
| 4 | 24 | $G_2P_1$ | 0.21 | 0.06 | 0.5 | 2.38 |
| 5 | 26 | $G_1P_0$ | 0.17 | 0.09 | 1.2 | 1.66 |
| 6 | 30 | $G_6P_5$ | 0.21 | 0.07 | 0.7 | 1.66 |
| 7 | 29 | $G_5P_4$ | 0.20 | 0.09 | 1.9 | 2.61 |
| 8 | 28 | $G_3P_2$ | 0.24 | 0.15 | 1.2 | 3.57 |
| 9 | 23 | $G_1P_0$ | 0.25 | 0.11 | 2.1 | 4.04 |
| 10 | 30 | $G_4P_3$ | 0.32 | 0.11 | 0.8 | 7.6 |
| 11 | 26 | $G_2P_1$ | 0.20 | 0.08 | 0.5 | 2.62 |
| 12 | 25 | $G_4P_3$ | 0.12 | 0.09 | 0.6 | 1.42 |
| 13 | 23 | $G_2P_1$ | 0.21 | 0.13 | 1.1 | 1.9 |
| 14 | 28 | $G_1P_0$ | 0.11 | 0.08 | 0.6 | 5.7 |
| 15 | 32 | $G_4P_3$ | 0.12 | 0.12 | 0.5 | 1.65 |
| 16 | 30 | $G_2P_1$ | 0.22 | 0.07 | 1.1 | 1.8 |
| 17 | 33 | $G_6P_5$ | 0.21 | 0.09 | 0.6 | 2.1 |
| 18 | 20 | $G_7P_6$ | 0.18 | 0.12 | 1.1 | 4.03 |
| 19 | 28 | $G_2P_1$ | 0.16 | 0.13 | 1.2 | 3.35 |
| 20 | 27 | $G_1P_0$ | 0.16 | 0.15 | 0.5 | 2.62 |

## (3) Prelabour spontaneous rupture of membranes
### Serum levels  Gp III

| No. of case | Age (years) | Gracidty / parity | Duration of rupture of membranes (hours) | Calcium mg/dl | Magnesium mg/dl | zinc µg/ml | Copper µg/ml |
|---|---|---|---|---|---|---|---|
| 1 | 28 | $G_1P_0$ | 8 | 9.4 | 2.1 | 0.207 | 1.59 |
| 2 | 20 | $G_1P_0$ | 24 | 4.5 | 1.6 | 0.207 | 1.72 |
| 3 | 30 | $G_1P_0$ | 48 | 9.8 | 1.06 | 0.206 | 2.03 |
| 4 | 28 | $G_2P_1$ | 72 | 7.9 | 1.1 | 0.38 | 1.89 |
| 5 | 22 | $G_1P_0$ | 48 | 8.1 | 1.15 | 0.212 | 1.95 |
| 6 | 23 | $G_1P_0$ | 72 | 4.5 | 2 | 0.22 | 2.28 |
| 7 | 23 | $G_2P_3$ | 8 | 10.2 | 2.1 | 0.173 | 1.87 |
| 8 | 23 | $G_1P_0$ | 12 | 10.1 | 1.06 | 0.311 | 1.74 |
| 9 | 30 | $G_5P_4$ | 8 | 7.8 | 2.5 | 0.312 | 2.26 |
| 10 | 29 | $G_5P_4$ | 12 | 8.2 | 1.5 | 0.224 | 1.99 |
| 11 | 25 | $G_2P_1$ | 12 | 9.5 | 1.02 | 0.225 | 1.91 |
| 12 | 24 | $G_6P_5$ | 12 | 8.2 | 1.03 | 0.569 | 2.11 |
| 13 | 19 | $G_7P_6$ | 48 | 7.3 | 1.03 | 0.242 | 1.74 |
| 14 | 22 | $G_4P_3$ | 48 | 8.2 | 1.02 | 0.587 | 2.02 |
| 15 | 23 | $G_3P_2$ | 72 | 7.2 | 1.04 | 0.586 | 1.55 |
| 16 | 29 | $G_7P_6$ | 12 | 9.4 | 1.4 | 0.241 | 2.25 |
| 17 | 30 | $G_3P_2$ | 24 | 7.7 | 1.05 | 0.223 | 1.94 |
| 18 | 32 | $G_6P_5$ | 48 | 7.6 | 1.07 | 0.173 | 1.88 |
| 19 | 31 | $G_2P_1$ | 36 | 8.3 | 1.04 | 0.172 | 1.75 |
| 20 | 30 | $G_1P_0$ | 48 | 8.2 | 1.7 | 0.22 | 1.54 |

## (4) Prelabour spontaneous rupture of membranes
## Fetal membranes levels  GP III

| No. of case | Age (years) | Gracidty / parity | Duration of rupture of membranes (hours) | Calcium mg/dl | Magnesium mg/dl | zinc µg/ml | Copper µg/ml |
|---|---|---|---|---|---|---|---|
| 1 | 28 | $G_1P_0$ | 8 | 0.09 | 0.03 | 0.8 | 0.57 |
| 2 | 20 | $G_1P_0$ | 24 | 0.14 | 0.09 | 1.0 | 0.714 |
| 3 | 30 | $G_1P_0$ | 48 | 0.20 | 0.05 | 0.8 | 0.523 |
| 4 | 28 | $G_2P_1$ | 72 | 0.21 | 0.06 | 0.7 | 0.524 |
| 5 | 22 | $G_1P_0$ | 48 | 0.12 | 0.03 | 0.7 | 0.499 |
| 6 | 23 | $G_1P_0$ | 72 | 0.13 | 0.05 | 0.8 | 0.476 |
| 7 | 23 | $G_3P_2$ | 8 | 0.11 | 0.06 | 0.5 | 0.476 |
| 8 | 23 | $G_1P_0$ | 12 | 0.12 | 0.03 | 0.7 | 0.404 |
| 9 | 30 | $G_4P_5$ | 8 | 0.23 | 0.03 | 1.1 | 0.595 |
| 10 | 29 | $G_6P_4$ | 12 | 0.11 | 0.08 | 0.6 | 0.38 |
| 11 | 25 | $G_2P_1$ | 12 | 0.15 | 0.04 | 1.5 | 0.47 |
| 12 | 24 | $G_6P_5$ | 12 | 0.13 | 0.09 | 1.0 | 0.37 |
| 13 | 17 | $G_7P_6$ | 48 | 0.04 | 0.02 | 0.5 | 0.498 |
| 14 | 22 | $G_4P_3$ | 48 | 0.16 | 0.05 | 0.7 | 0.497 |
| 15 | 23 | $G_3P_2$ | 72 | 0.11 | 0.04 | 1.0 | 0.524 |
| 16 | 29 | $G_7P_6$ | 12 | 0.12 | 0.03 | 0.7 | 0.48 |
| 17 | 30 | $G_3P_2$ | 24 | 0.22 | 0.06 | 0.6 | 0.49 |
| 18 | 32 | $G_6P_5$ | 48 | 0.17 | 0.02 | 0.4 | 0.405 |
| 19 | 31 | $G_2P_1$ | 36 | 0.09 | 0.07 | 0.5 | 0.477 |
| 20 | 30 | $G_1P_0$ | 48 | 0.08 | 0.08 | 0.8 | 0.478 |

## (5) Preterm labour

## Serum level G$\rho$ II

| No. of case | Age (years) | Gracidty / parity | Duration of pregnancy | Calcium mg/dl | Magnesium mg/dl | zinc µg/ml | Copper µg/ml |
|---|---|---|---|---|---|---|---|
| 1 | 20 | $G_1P_0$ | ±36 w.s. | 9.5 | 1.3 | 0.304 | 1.62 |
| 2 | 30 | $G_1P_0$ | ±34 w.s. | 7.3 | 2.1 | 0.305 | 2.23 |
| 3 | 32 | $G_4P_2$ | ±35 w.s. | 7.2 | 1.4 | 0.336 | 2.27 |
| 4 | 30 | $G_3P_2$ | ±35 w.s. | 9 | 2.1 | 0.335 | 1.88 |
| 5 | 26 | $G_6P_3A_2$ | ±36 w.s. | 7.7 | 1.1 | 0.205 | 2.71 |
| 6 | 29 | $G_1P_0$ | ±30 w.s. | 11 | 1.6 | 0.214 | 1.72 |
| 7 | 30 | $G_2P_1$ | ±36 w.s. | 11.1 | 2.3 | 0.336 | 2.06 |
| 8 | 20 | $G_6P_5A_1$ | ±30 w.s. | 7.6 | 1.5 | 0.351 | 1.98 |
| 9 | 22 | $G_3P_2$ | ±28 w.s. | 9.5 | 1.9 | 0.183 | 2.66 |
| 10 | 26 | $G_6P_5$ | ±32 w.s. | 9.4 | 1.8 | 0.244 | 2.86 |
| 11 | 25 | $G_1P_0$ | ±35 w.s. | 9.0 | 1.04 | 0.214 | 1.65 |
| 12 | 28 | $G_1P_0$ | ±34 w.s. | 9.0 | 1.04 | 0.275 | 1.62 |
| 13 | 32 | $G_3P_2$ | ±32 w.s. | 9.5 | 2.1 | 0.107 | 1.53 |
| 14 | 43 | $G_4P_3$ | ±30 w.s. | 7.6 | 2.2 | 0.198 | 2.44 |
| 15 | 32 | $G_1P_0$ | ±36 w.s. | 7.5 | 1.75 | 0.183 | 2.61 |
| 16 | 28 | $G_3P_2$ | ±36 w.s. | 7.4 | 2.1 | 0.092 | 2.40 |
| 17 | 23 | $G_2P_1$ | ±36 w.s. | 8.0 | 2.1 | 0.091 | 1.66 |
| 18 | 25 | $G_2P_1$ | ±34 w.s. | 10.1 | 1.74 | 0.197 | 1.73 |
| 19 | 25 | $G_6P_5$ | ±35 w.s. | 9.0 | 1.65 | 0.198 | 2.22 |
| 20 | 25 | $G_6P_5$ | ±35 w.s. | 9.5 | 1.2 | 0.107 | 2.21 |