# *RESULTS*

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**Table (1)** Shows mean value ± S.D. of clinical data in control elective caesarean section (group I). The maternal age ranged from 19-35 years with mean value of 28.067, S.D was ± 5.47 and the S.E was ± 1.41. The gestational age ranged from 38-40 weeks with mean value of 39.2, S.D was ± 0.775 and S.E was ± 0.2. However, the parity ranged from 1-9 with mean value of 3.6 , S.D. was ± 2.50 and the S.E. was ± 0.65 .

**Table (2)** Shows mean value ±S.D of clinical data in spontaneous vaginal term labor (group II). The maternal age ranged from 19-35 years with mean value of 26.8, S.D. was ± 5.91 and the S.E was ± 1.32. The gestational age ranged from 38-40 weeks with mean value of 39.45, S.D was ± 0.605 and S.E. was ± 0.135. However, the parity ranged from 1-5 with mean value of 2.5 , S.D. was ± 1.54 and the S.E was ± 0.34 .

**Table (3)** : Shows mean value ± S.D. of clinical data in group of spontaneous preterm labor ( group III) . The maternal age ranged from 22-35 years with mean value of 27.07 , S.D. was ± 3.73 and the S.E. was ± 0.96. The gestational age ranged from 26-35 weeks with mean value of 31.4, S.D. was ± 2.97 and S.E. was ± 0.77 . However, the parity ranged from 1-5 with mean value of 2.067 , S.D was ± 1.44 and S.E. was ± 0.37

Table ( 1 ) Clinical data of women in elective caesarean section control group (group I )

| Patients No. | Maternal age (years) | Gestational age (weeks) | Gravidity/Parity | | indication of caesarean section | Fetal outcome (sex) |
|---|---|---|---|---|---|---|
| | | | primigravidae | multigravidae | | |
| 1 | 26 | 40 | | $G_2P_{1+0}$ | Previous one C.S. + cephalopelvis disproportion( C.P.D) | male |
| 2 | 32 | 39 | P.G. | | antepartum haermorrhage | female |
| 3 | 19 | 40 | | $G_3P_{0+2}$ | ablique lie + large size baby | female |
| 4 | 32 | 39 | | $G_2P_{1+0}$ | previous one C.S. | male |
| 5 | 32 | 40 | | $G_6P_{4+1}$ | previous two C.S. + tubal ligation | male |
| 6 | 19 | 38 | P.G. | | antepartum haermorrhage | male |
| 7 | 27 | 39 | | $G_3P_{2+0}$ | previous two C.S. | female |
| 8 | 33 | 38 | | $G_9P_{1+7}$ | previous one C.S. + bad obstetric history | male |
| 9 | 35 | 39 | | $G_7P_{4+2}$ | previous one C.S. + A.P.H. | female |
| 10 | 30 | 40 | | $G_4P_{3+0}$ | previous one C.S.+ bad obstetric history | male |
| 11 | 22 | 40 | | $G_5P_{4+0}$ | Previous two C.S. | female |
| 12 | 30 | 39 | | $G_3P_{2+0}$ | A.P.H | male |
| 13 | 35 | 40 | | $G_6P_{4+1}$ | previous two C.S | female |
| 14 | 27 | 39 | P.G | | A.P.H | female |
| 15 | 22 | 38 | P.G | | previous two C.S | male |
| Range | 19.35 | 38-40 | 1-9 | | | |
| mean | 28.067 | 39.2 | 3.6 | | | |
| ±S.D | 5.47 | 0.775 | 2.50 | | | |
| ±S.E | 1.41 | 0.2 | 0.65 | | | |

Table ( 2 ) Clinical data of women with Spontaneous vaginal delivery group (group II)

| Patients No. | Maternal age (years) | Gestational age (weeks) | Gravidity/Parity | | length of labor (hours) | Fetal outcome (sex) |
|---|---|---|---|---|---|---|
| | | | primigravidae | multigravidae | | |
| 1 | 21 | 39 | | $G_2P_{1+0}$ | 5 hours | female |
| 2 | 30 | 40 | | $G_5P_{4+0}$ | 6 hours | female |
| 3 | 26 | 40 | P.G. | | 12 hours | female |
| 4 | 25 | 39 | P.G. | | 10 hours | male |
| 5 | 35 | 39 | | $G_5P_{3+1}$ | 5 hours | female |
| 6 | 32 | 39 | | $G_3P_{2+0}$ | 6 hours | female |
| 7 | 27 | 40 | | $G_2P_{1+0}$ | 5 hours | female |
| 8 | 21 | 38 | | $G_2P_{0+1}$ | 12 hours | female |
| 9 | 19 | 39 | P.G. | | 15 hours | female |
| 10 | 30 | 40 | | $G_3P_{1+1}$ | 12 hours | male |
| 11 | 35 | 40 | | $G_5P_{3+1}$ | 3 hours | female |
| 12 | 19 | 39 | P.G. | | 10 hours | female |
| 13 | 19 | 39 | P.G. | | 12 hours | male |
| 14 | 34 | 40 | | $G_4P_{0+3}$ | 5 hours | female |
| 15 | 24 | 40 | | $G_2P_{1+0}$ | 6 hours | female |
| 16 | 32 | 40 | P.G. | | 8 hours | male |
| 17 | 35 | 40 | | $G_4P_{2+1}$ | 6 hours | male |
| 18 | 19 | 39 | P.G. | | 12 hours | male |
| 19 | 24 | 39 | | $G_2P_{1+0}$ | 8 hours | female |
| 20 | 29 | 40 | | $G_3P_{2+0}$ | 5 hours | male |
| Range | 19-35 | 38-40 | 1-5 | | | |
| mean | 26.8 | 39.45 | 2.5 | | | |
| ±S.D | 5.91 | 0.605 | 1.54 | | | |
| ±S.E | 1.32 | 0.135 | 0.34 | | | |

Table ( 3 ) Clinical data of women with Spontaneous preterm labor (group III)

| Patients No. | Maternal age (years) | Gestational age (weeks) | Gravidity/Parity | | length of labor (hours) | Fetal outcome (sex) |
|---|---|---|---|---|---|---|
| | | | primigravidae | multigravidae | | |
| 1 | 22 | 30 | | $G_2P_{1+0}$ | 5 hours | male |
| 2 | 28 | 26 | | $G_5P_{0+4}$ | 6 hours | female |
| 3 | 25 | 33 | P.G. | | 7 hours | male |
| 4 | 25 | 35 | P.G. | | 13 hours | male |
| 5 | 24 | 33 | | $G_2P_{1+0}$ | inferquent labor pain for 20 hours | female |
| 6 | 30 | 29 | P.G. | | 10 hours | male |
| 7 | 27 | 32 | | $G_2P_{1+0}$ | 5 hours | female |
| 8 | 35 | 35 | | $G_4P_{3+0}$ | 2 hours | male |
| 9 | 33 | 35 | P.G. | | 10 hours | female |
| 10 | 25 | 33 | P.G. | | 6 hours | male |
| 11 | 22 | 30 | | $G_2P_{1+0}$ | 5 hours | male |
| 12 | 28 | 26 | | $G_5P_{0+4}$ | 6 hours | female |
| 13 | 25 | 33 | P.G. | | 7 hours | male |
| 14 | 30 | 29 | P.G | | 10 hours | male |
| 15 | 27 | 32 | | $G_2P_{1+0}$ | 5 hours | female |
| Range | 28-35 | 26-35 | 1-5 | | | |
| mean | 27.07 | 31.4 | 2.067 | | | |
| ±S.D | 3.73 | 2.97 | 1.44 | | | |
| ±S.E | 0.96 | 6.77 | 0.37 | | | |

**Table (4) & Fig (1) :** Show leukotriene $B_4$ ($LTB_4$) pg/ml in human amniotic fluid. The mean value ± S.D. of $LTB_4$ in control elective caesarean section (group I) was 72.73 ± 59.85 pg/ml and the median was 45 pg/ml . Whereas the mean value ± S.D. of $LTB_4$ in spontaneous vaginal term labor (group II) was 134.78 ± 111.41 pg/ml and the median was 84 pg/ml. Finally, in spontaneous preterm labor (group III), the mean value ±S.D. of $LTB_4$ was 51.8 ± 19.986 pg/ml and the median was 45pg/ml . On the other hand, $LTB_4$ was not detectable in two samples of group II.

**Table (5) & Fig. (2) :** Show leukotriene $B_4$ ($LTB_4$) pg/ml in human umbilical cord plasma. The mean value ±S.D. of $LTB_4$ in control elective caesarean section at term (group I) was 56.1538 ± 18.5735 pg/ml and the median was 50 pg/ml. Whereas the mean value ±S.D. of $LTB_4$ in spontaneous vaginal term labor (group II) was 95.6111 ± 78.637 pg/ml and the median was 69pg/ml. Finally, in spontaneous preterm labor(group III), the mean value ± S.D. of $LTB_4$ was 83.4285 ± 24.3301 pg/ml and the median was 80.5 pg/ml . On the other hand, $LTB_4$ was not detectable in two samples in group I and group II and only one sample in group III.

Table (4): Amniotic fluid concentration of leukotriene $B_4$ ($LTB_4$) pg/ml, in control elective caesarean section at term ( group I ) spontaneous vaginal term labor (group II ) and spontaneous preterm labor (group III)

| Patients No | Group I | Group II | Group III |
|---|---|---|---|
| 1 | 9 | 84 | 31 |
| 2 | 37 | 110 | 40 |
| 3 | 45 | 400 | 80 |
| 4 | 52 | 72 | 45 |
| 5 | 190 | 70 | 34 |
| 6 | 27 | N.D. | 80 |
| 7 | 135 | 90 | 70 |
| 8 | 32 | 84 | 54 |
| 9 | 45 | 54 | 32 |
| 10 | 27 | 72 | 78 |
| 11 | 78 | 240 | 80 |
| 12 | 37 | N.D | 41 |
| 13 | 190 | 56 | 30 |
| 14 | 135 | 34 | 37 |
| 15 | 52 | 90 | 45 |
| 16 | — | 370 | — |
| 17 | — | 280 | — |
| 18 | — | 80 | — |
| 19 | — | 170 | — |
| 20 | — | 70 | — |
| Nc | 15 | 18 | 15 |
| Range | 9-190 | 34-400 | 30-80 |
| Mean | 72.7333 | 134.7778 | 51.8 |
| ± S.D. | 59.8456 | 111.4126 | 19.986 |
| ± S.E. | 15.45 | 26.26 | 5.160 |
| Median | 45 | 84 | 45 |

N.D. = Non detectable

Table (5) Leukotriene $B_4$ ($LBT_4$) pg/ml in human umbilical cord plasma in control elective caesarean section at term (group I), spontaneous vaginal term labor (group II) and spontaneous preterm labor (group III).

| Patients No | Group I | Group II | Group III |
|---|---|---|---|
| 1 | 45 | 27 | 68 |
| 2 | 60 | 44 | N.D. |
| 3 | 50 | 40 | 115 |
| 4 | 50 | 135 | 100 |
| 5 | N.D. | 115 | 47 |
| 6 | 37 | 45 | 68 |
| 7 | 37 | 66 | 115 |
| 8 | 35 | 85 | 100 |
| 9 | 52 | 94 | 120 |
| 10 | 76 | 40 | 94 |
| 11 | 90 | N.D. | 66 |
| 12 | 58 | 130 | 90 |
| 13 | N.D. | 58 | 71 |
| 14 | 50 | 78 | 56 |
| 15 | 90 | N.D. | 58 |
| 16 | — | 56 | — |
| 17 | — | 350 | — |
| 18 | — | 220 | — |
| 19 | — | 71 | — |
| 20 | — | 67 | — |
| No | 13 | 18 | 14 |
| Range | 37-90 | 27-350 | 47-120 |
| Mean | 56.1538 | 95.6111 | 83.4286 |
| ±S.D. | 18.5735 | 78.637 | 24.3301 |
| ± S.E. | 5.151 | 18.53 | 6.503 |
| Median | 50 | 69 | 80.50 |

N.D. = Non detectable

Fig (1): Amniotic fluid leukotriene B4 ( LTB4) in control elective caesarean section at term ( group I ), spontaneous vaginal term labor ( group II ) and spontaneous preterm labor ( group III ).
Horizontal bars represent the medians.

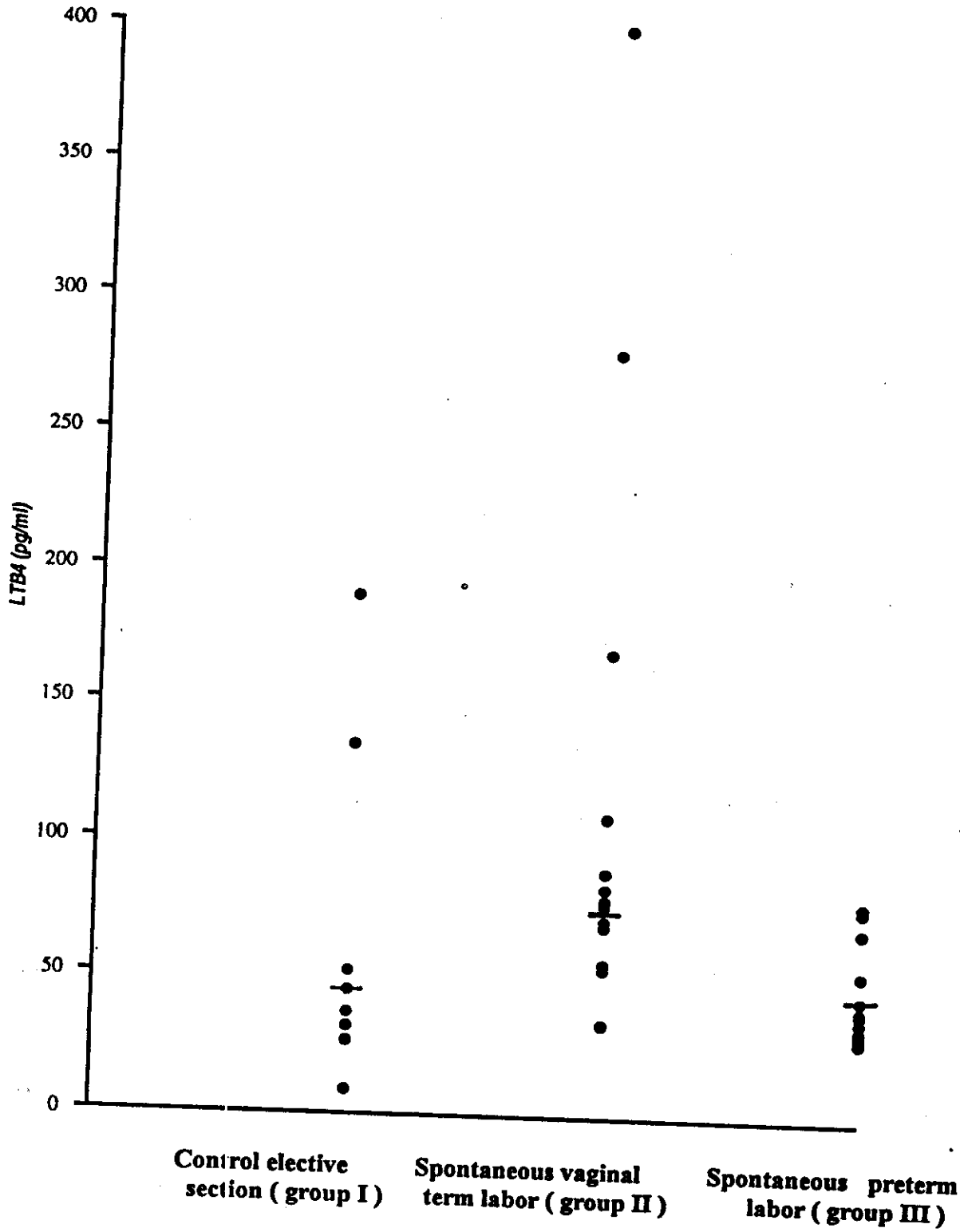


Fig (2): Umbilical cord plasma leukotriene $B_4$ ($LTB_4$) in control elective caesarean section at term ( group I), spontaneous vaginal term labor (group II), and spontaneous preterm labor ( group III). Horizontal bars represent the medians.

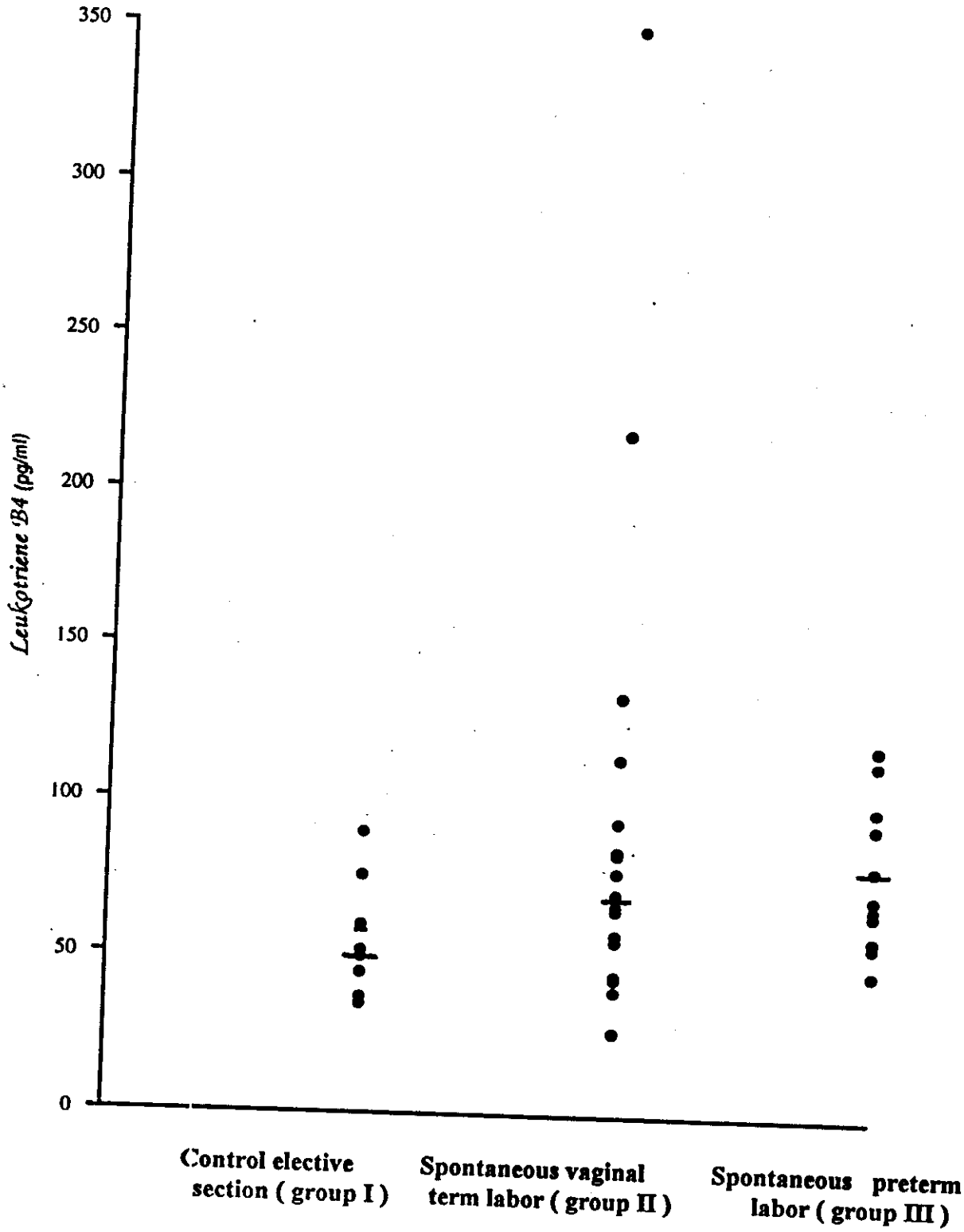


**Table (6) & Fig. (3):** Show progesterone (prog) level ng/ml in human amniotic fluid. The mean value ± S.D. of progesterone in control elective caesarean section (group I) was 51.8 ± 28.43 ng/ml and the median was 52 ng/ml. Whereas the mean value ± S.D. of progesterone in spontaneous vaginal term labor (group II) was 44.175 ± 27.065 ng/ml and the median was 36 ng/ml. Finally, in spontaneous preterm labor (group III), the mean value ±S.D. of progesterone was 45.467 ± 28.995 ng/ml and the median was 40 ng/ml .

**Table (7) & Fig. (4):** Show progesterone (prog) ng/ml in human umbilical cord serum. The mean value ±S.D. of progesterone in control elective caesarean section at term (group I ) was 279.53 ± 88.63 ng/ml and the median was 280 ng/ml. Whereas the mean value ±S.D. of progesterone in spontaneous vaginal term labor (group II) was 329.5 ± 66.69 ng/ml and the median was 335 ng/ml. Finally, in spontaneous preterm labor (group III), the mean value ± S.D. of progesterone was 266.07 ± 155.23 ng/ml and the median was 380 ng/ml .

Table (6) Amniotic fluid concentration of progesterone (ng/ml) in control elective caesarean section at term (group I), spontaneous vaginal term labor (group II) and spontaneous preterm labor (group III)

| Patients No | Group I | Group II | Group III |
|---|---|---|---|
| 1 | 60 | 39 | 36 |
| 2 | 78 | 28 | 94 |
| 3 | 40 | 44 | 40 |
| 4 | 22 | 29 | 40 |
| 5 | 96 | 25 | 12 |
| 6 | 70 | 52 | 21 |
| 7 | 18 | 34 | 47 |
| 8 | 18 | 13.5 | 21 |
| 9 | 52 | 38 | 40 |
| 10 | 29 | 96 | 34 |
| 11 | 40 | 88 | 95 |
| 12 | 19 | 33 | 105 |
| 13 | 60 | 13 | 19 |
| 14 | 70 | 15 | 40 |
| 15 | 105 | 28 | 38 |
| 16 | — | 96 | — |
| 17 | — | 88 | — |
| 18 | — | 54 | — |
| 19 | — | 45 | — |
| 20 | — | 25 | — |
| No | 15 | 20 | 15 |
| Range | 18-105 | 13-96 | 12-105 |
| Mean | 51.8 | 44.175 | 45.4667 |
| ± S.D. | 28.428 | 27.0649 | 28.9947 |
| ± S.E. | 7.34 | 6.05 | 7.486 |
| Median | 52 | 36 | 40 |

Table (7) : Progesterone (ng/ml) in human umbilical cord serum in control elective caesarean section at term (group I), spontaneous vaginal term labor (group II) and spontaneous preterm labor (group III ).

| Patients No | Group I | Group II | Group III |
|---|---|---|---|
| 1 | 250 | 380 | 380 |
| 2 | 400 | 260 | 47 |
| 3 | 138 | 380 | 54 |
| 4 | 130 | 360 | 78 |
| 5 | 270 | 310 | 400 |
| 6 | 300 | 390 | 400 |
| 7 | 380 | 360 | 400 |
| 8 | 280 | 290 | 400 |
| 9 | 400 | 450 | 54 |
| 10 | 155 | 380 | 380 |
| 11 | 380 | 300 | 400 |
| 12 | 290 | 220 | 270 |
| 13 | 250 | 260 | 270 |
| 14 | 300 | 310 | 78 |
| 15 | 270 | 290 | 380 |
| 16 | — | 380 | — |
| 17 | — | 400 | — |
| 18 | — | 380 | — |
| 19 | — | 190 | — |
| 20 | — | 300 | — |
| No | 15 | 20 | 15 |
| Range | 130-400 | 190-450 | 47-400 |
| Mean | 279.53 | 329.5 | 266.067 |
| ± S.D. | 88.635 | 66.6866 | 155.227 |
| ± S.E. | 22.89 | 14.91 | 40.08 |
| Median | 280 | 335 | 380 |

Fig (3) Amniotic fluid progesterone in control elective caesarean section at term ( group I), spontaneous vaginal term labor ( group II) and spontaneous preterm labor ( group III ).
Horizontal bars represent the medians .

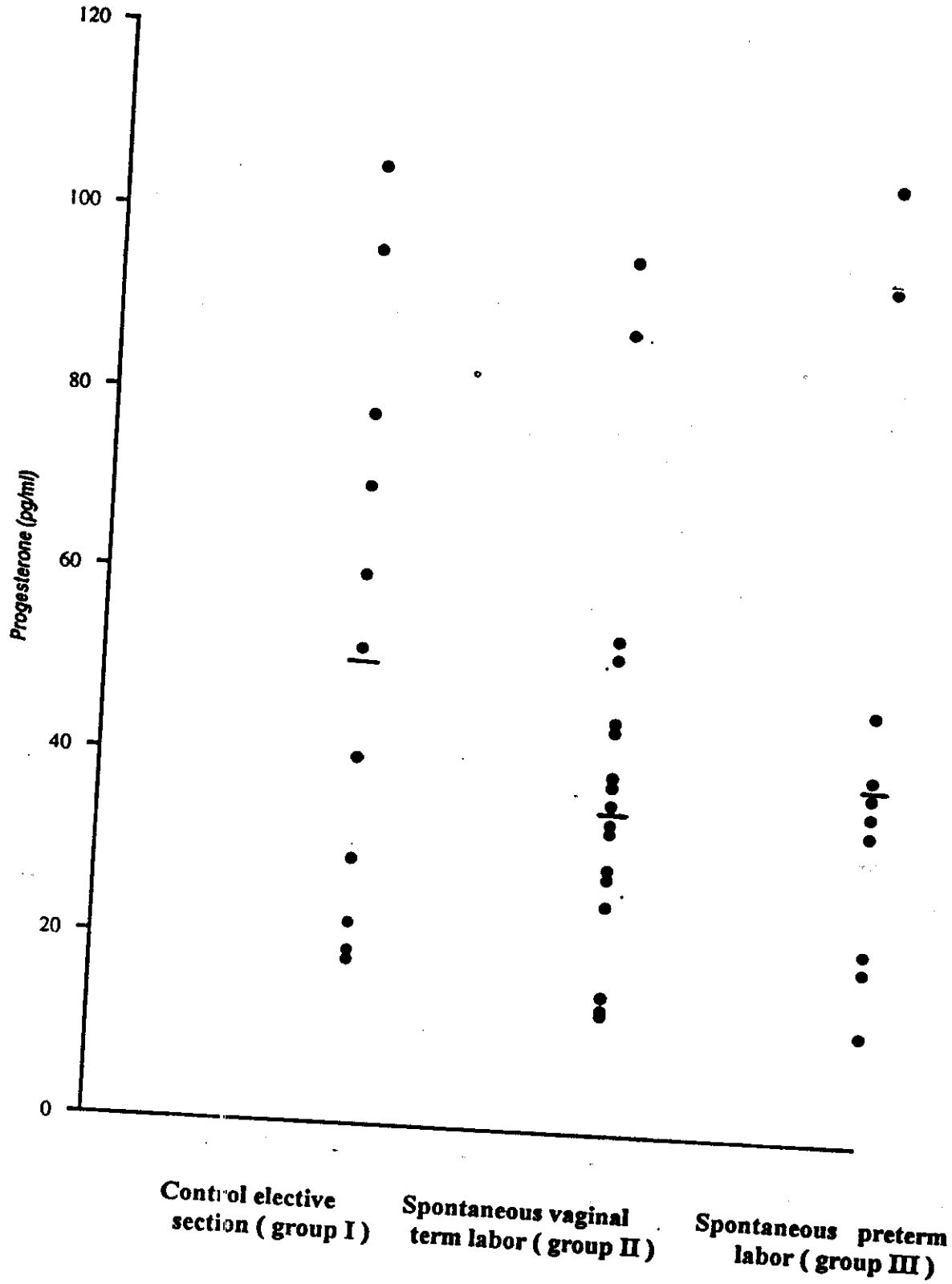


Fig (4) Umbilical cord serum progesterone in control elective caesarean section at term ( group I ), spontaneous vaginal term labor ( group II) and spontaneous preterm labor ( group III ).
Horizontal bars represent the medians.

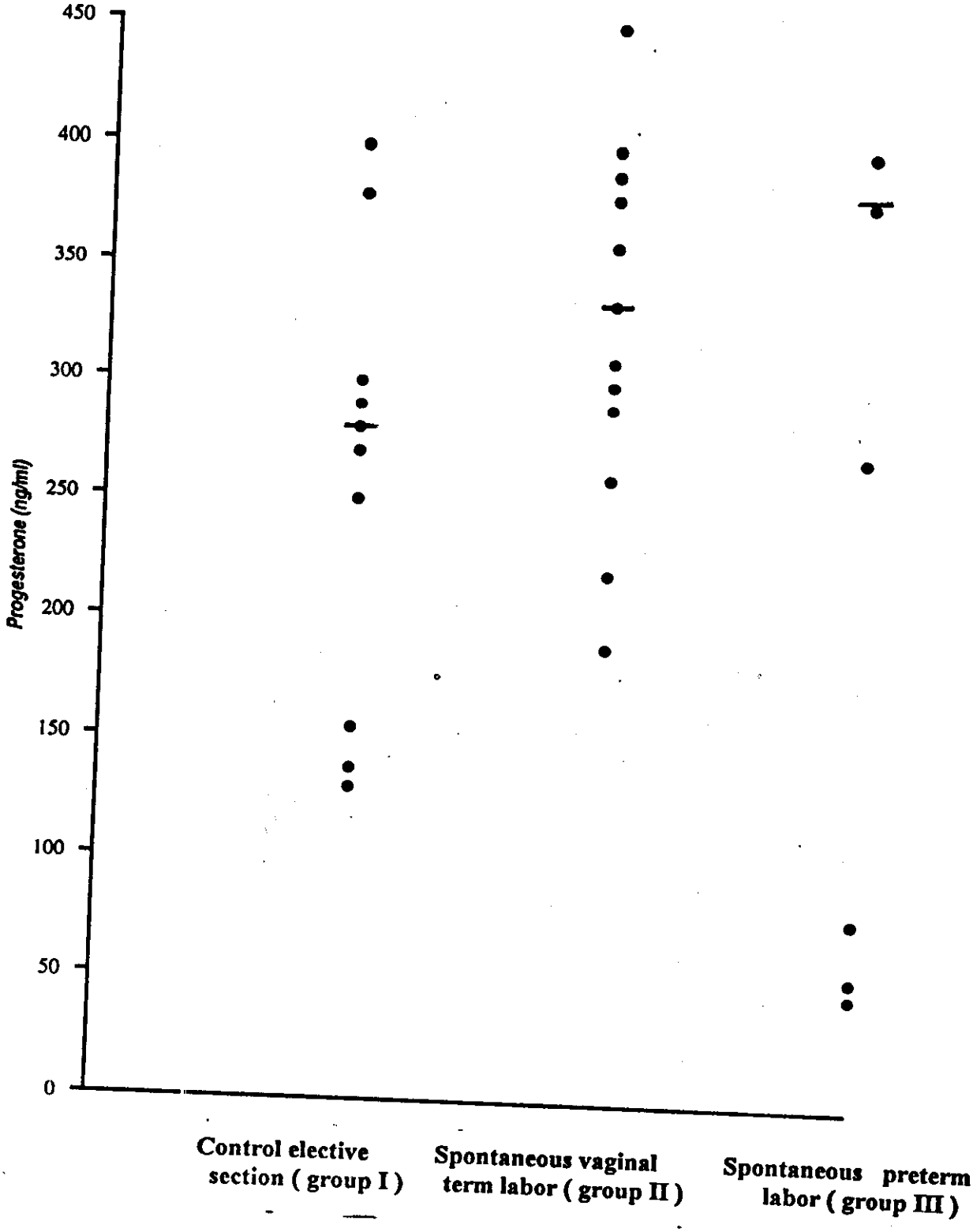


**Table (8) & Fig (5) :** Show estradiol ($E_2$) level pg/ml in human amniotic fluid. The mean value ± S.D. of $E_2$ in control elective caesarean section (group I) was 1014 ± 818.193 pg/ml and the median was 600 pg/ml. Whereas the mean value ± S.D. of $E_2$ in spontaneous vaginal term labor (group II) was 1698.5 ± 1159.21 pg/ml and the median was 1350 pg/ml. Finally, in spontaneous preterm labor (group III), the mean value ±S.D. of $E_2$ was 1267.33 ± 1329.127 pg/ml and the median was 580 pg/ml .

**Table (9) & Fig. (6) :** Show estradiol ($E_2$) pg/ml in human umbilical cord serum. The mean value ±S.D. of $E_2$ in control elective caesarean section at term (group I) was 3520 ± 1239.93 pg/ml and the median was 3500 pg/ml. Whereas the mean value ±S.D. of $E_2$ in spontaneous vaginal term labor (group II) was 4635 ± 1566.52 pg/ml and the median was 4450 pg/ml. Finally, in spontaneous preterm labor(group III), the mean value ± S.D. of $E_2$ was 6320 ± 2007.91 pg/ml and the median was 6200 pg/ml.

Table (8) Amniotic fluid concentration of estradiol ($E_2$)pg/ml in control elective caesarean section at term (group I), spontanous vaginal term labor (group II) an spontaneous preterm labor (group III)

| Patients No | Group I | Group II | Group III |
|---|---|---|---|
| 1 | 450 | 590 | 3800 |
| 2 | 400 | 2600 | 350 |
| 3 | 3300 | 750 | 580 |
| 4 | 1100 | 2700 | 750 |
| 5 | 600 | 800 | 1300 |
| 6 | 1300 | 1600 | 400 |
| 7 | 950 | 2900 | 440 |
| 8 | 400 | 600 | 540 |
| 9 | 500 | 580 | 3400 |
| 10 | 430 | 1600 | 350 |
| 11 | 2100 | 600 | 550 |
| 12 | 440 | 1700 | 400 |
| 13 | 540 | 3700 | 350 |
| 14 | 1700 | 1050 | 600 |
| 15 | 1000 | 4000 | 1600 |
| 16 | — | 1700 | — |
| 17 | — | 1100 | — |
| 18 | — | 600 | — |
| 19 | — | 3700 | — |
| 20 | — | 1100 | — |
| No | 15 | 20 | 15 |
| Range | 400-3300 | 580-4000 | 350-4000 |
| Mean | 1014 | 1698.5 | 1267.333 |
| ± S.D. | 818.193 | 1159.207 | 1329.1268 |
| ± S.E. | 211.3 | 259.2 | 343.2 |
| Median | 600 | 1350 | 580 |

Table (9) Estradiol (E2) concentration ( Pg/ml ) in human umbilical cord serum in control elective caesarean section at term (group I), spontaneous vaginal term labor (group II) and spontaneous preterm labor (group III).

| Patients No | Group I | Group II | Group III |
|---|---|---|---|
| 1 | 2500 | 2700 | 6200 |
| 2 | 3100 | 5200 | 5000 |
| 3 | 3200 | 5200 | 6200 |
| 4 | 5500 | 3100 | 6200 |
| 5 | 4700 | 4400 | 8500 |
| 6 | 2100 | 3500 | 9800 |
| 7 | 4000 | 3200 | 9000 |
| 8 | 3800 | 6000 | 4500 |
| 9 | 5200 | 4000 | 3400 |
| 10 | 3000 | 8000 | 4600 |
| 11 | 1900 | 3000 | 3800 |
| 12 | 1300 | 7000 | 6600 |
| 13 | 4500 | 4600 | 5000 |
| 14 | 4500 | 4000 | 7000 |
| 15 | 3500 | 6000 | 9000 |
| 16 | — | 4200 | — |
| 17 | — | 5000 | — |
| 18 | — | 7000 | — |
| 19 | — | 2100 | — |
| 20 | — | 4500 | — |
| No | 15 | 20 | 15 |
| Range | 1300-5500 | 2100-8000 | 3400-9800 |
| Mean | 3520 | 4635 | 6320 |
| ± S.D. | 1239.9309 | 1566.516 | 2007.9129 |
| ± S.E. | 320.1 | 350.3 | 518.4 |
| Median | 3500 | 4450 | 6200 |

Fig (5): Amniotic fluid estradiol ( E2) in control elective caesarean section at term ( group I), spontaneous vaginal term labor ( group II ) and spontaneous preterm labor ( groupIII ) .
Horizontal bars represent the medians

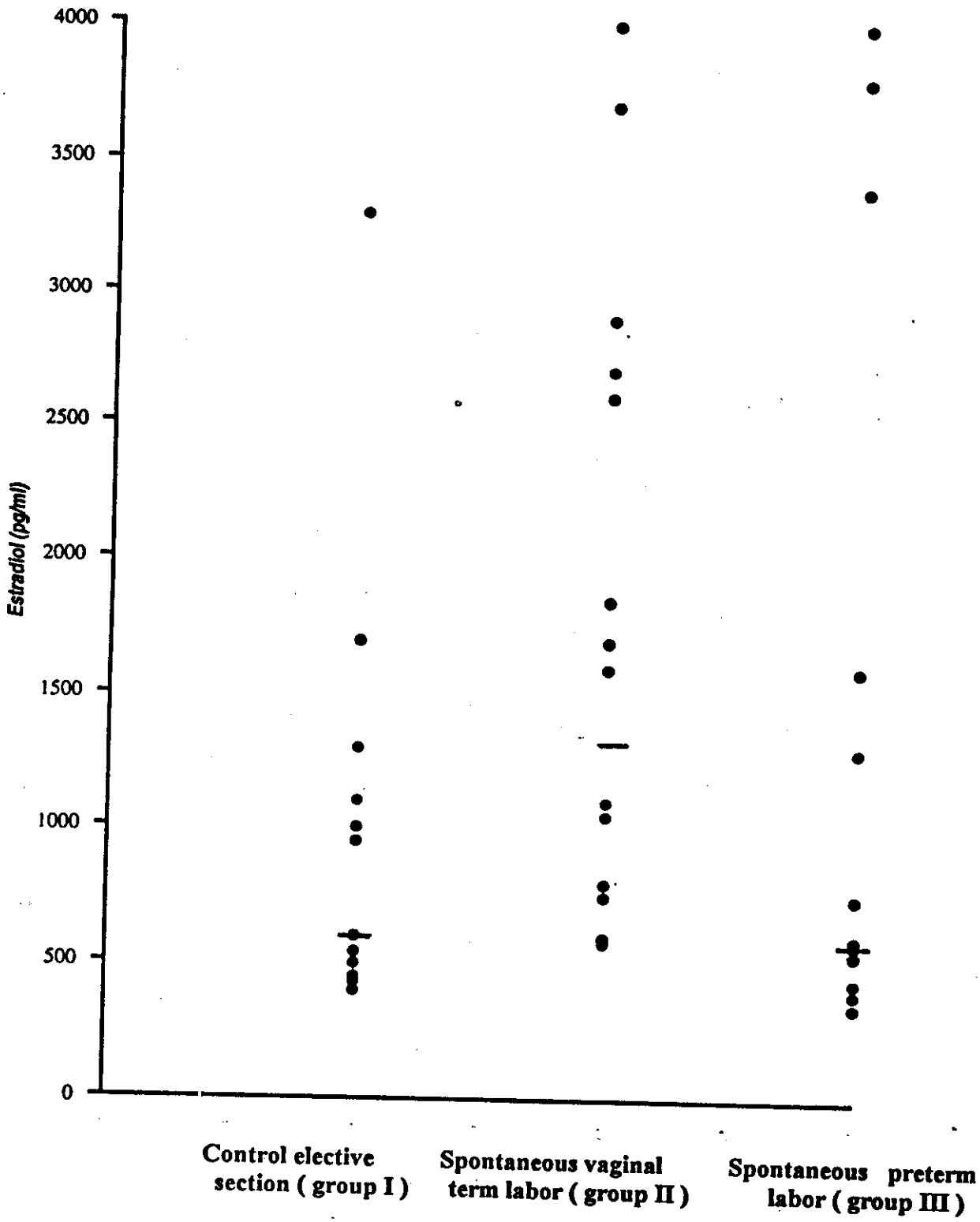


Fig (6):Umbilical cord serum estradiol (E2) in control elective caesarean section at term ( group I), spontaneous vaginal term labor ( group II) and spontaneous preterm labor ( group III).
Horizontal bars represent the medians.

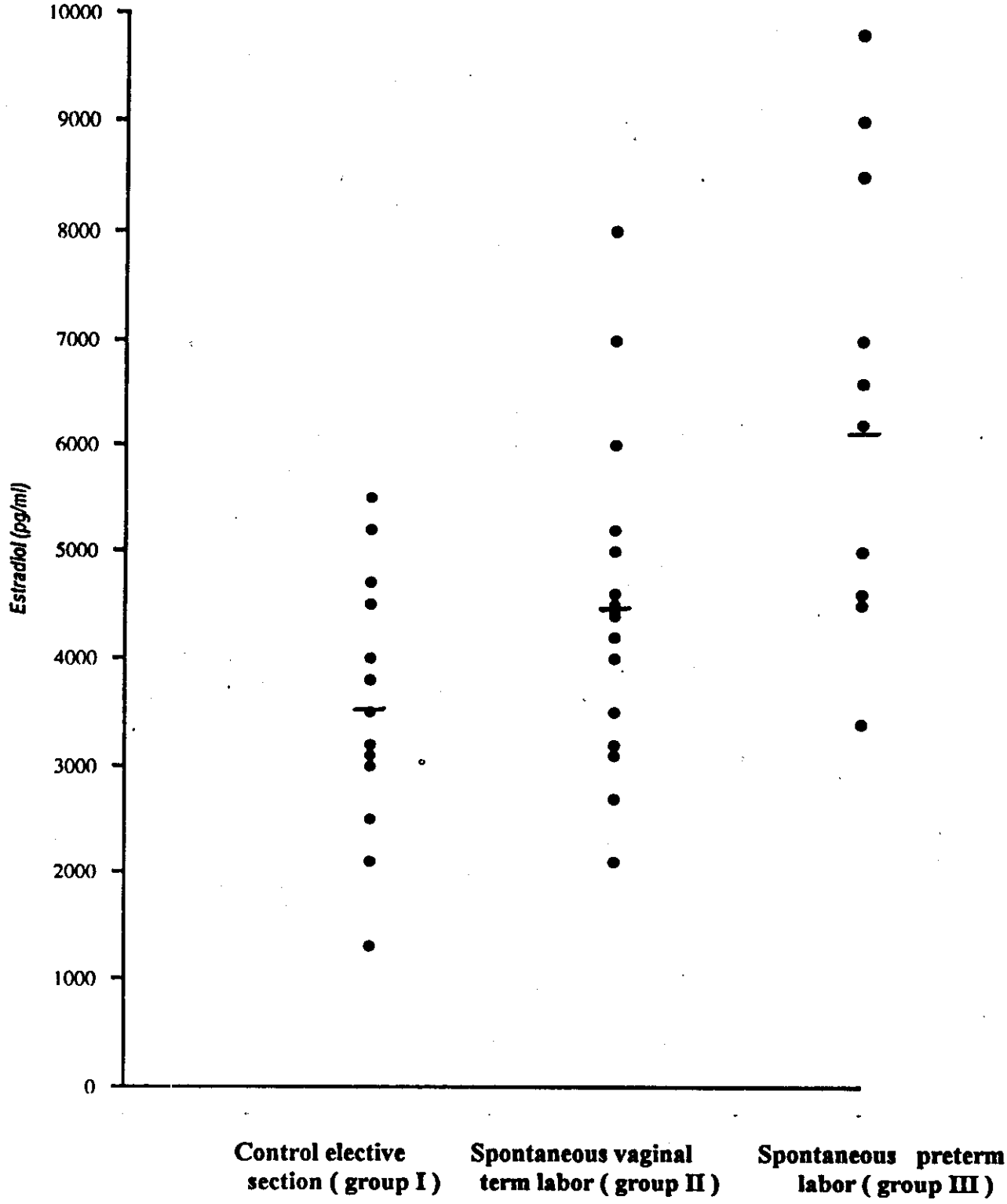


**Table (10) Fig (7) :** Show comparative data of amniotic fluid leukotriene $B_4$ (pg/ml). The mean value of amniotic fluid $LTB_4$ in spontaneous vaginal term labor (group II) was (134.778 ± 111.413) significantly increased than control elective caesarean section at term (group I) was (72.733 ± 59.846)( $P<0.05$, Wilcoxon rank sum test ). But the mean value of $LTB_4$ in spontaneous preterm labor (group III) . was (51.8 ± 19.986) insignificantly decreased than the control group ($P > 0.05$). Moreover, there was significant decreased in comparison between preterm and spontaneous vaginal term labor ($P1 < 0.05$, Wilcoxon rank sum test).

**Table (11) fig (8) :** Show comparative data of leukotriene $B_4$ (pg/ml) in human umbilical cord plasma. The mean value of umbilical cord plasma $LTB_4$ in spontaneous vaginal term labor was (95.61± 78.64) significantly increased than control elective caesarean section at term (group I), (56.15 ± 18.57) ($P<0.05$, Wilcoxon rank sum test). Also, in spontaneous preterm labor the mean value was (83.43± 24.33) significantly increased than control group ($P<0.01$). Moreover, there was insignificant change, in comparison between preterm and spontaneous vaginal term labor ($P1 >0.05$, Wilcoxon rank sum test ).

Table (10) Descriptive statistics for amniotic fluid leukotriene B4 (LTB4) levels (pg/ml) in :
Group I : Control elective caesarean section at term .
Group II : Spontaneous vaginal term labor .
Group III: Spontaneous preterm labor.

| Statistical parameters | Group I | Group II | Group III |
|---|---|---|---|
| No. Observations | 15 | 18 | 15 |
| Mean | 72.733 | 134.778 | 51.8 |
| S.D. | 59.846 | 111.413 | 19.986 |
| Median | 45 | 84 | 45 |
| P | - | <0.05* | > 0.05 |
| $P^1$ | | | < 0.05* |

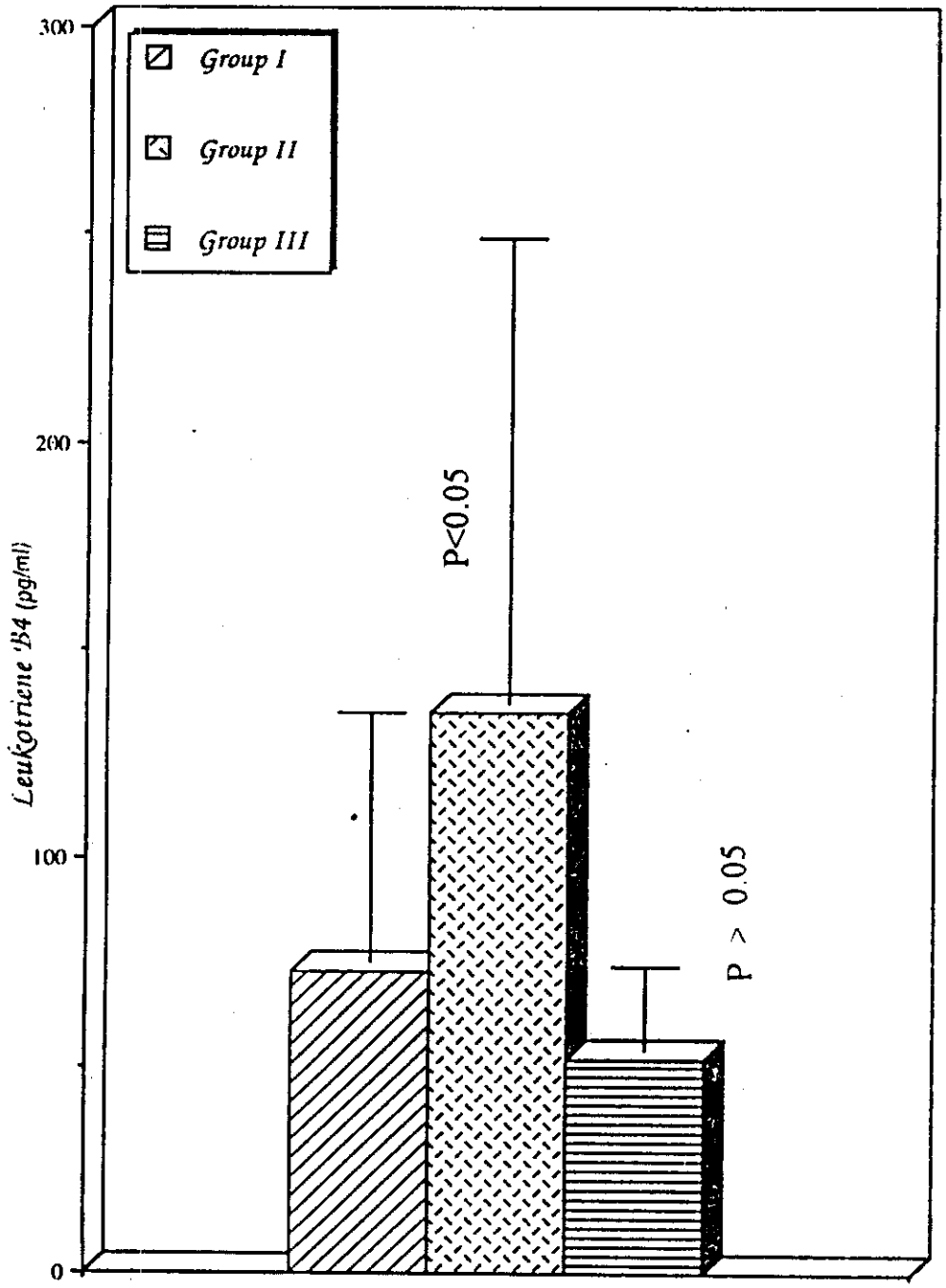
P : Compared to control group .
$P_1$ : Compared to group II
* : Significant .

Table (11) : Descriptive statistics for umbilical cord plasma leukotriene $B_4$ ($LTB_4$) levels (Pg/ml)in :
Group I : Control elective caesarean section at term .
Group II : Spontaneous vaginal term labor .
Group III: Spontaneous preterm labor.

| Statistical parameters | Group I | Group II | Group III |
|---|---|---|---|
| No. Observations | 13 | 18 | 14 |
| Mean | 56.15 | 95.61 | 83.43 |
| S.D.± | 18.57 | 78.64 | 24.33 |
| Median | 50 | 69 | 80.5 |
| P | | <0.05* | < 0.01* |
| $p^1$ | | | > 0.05 |

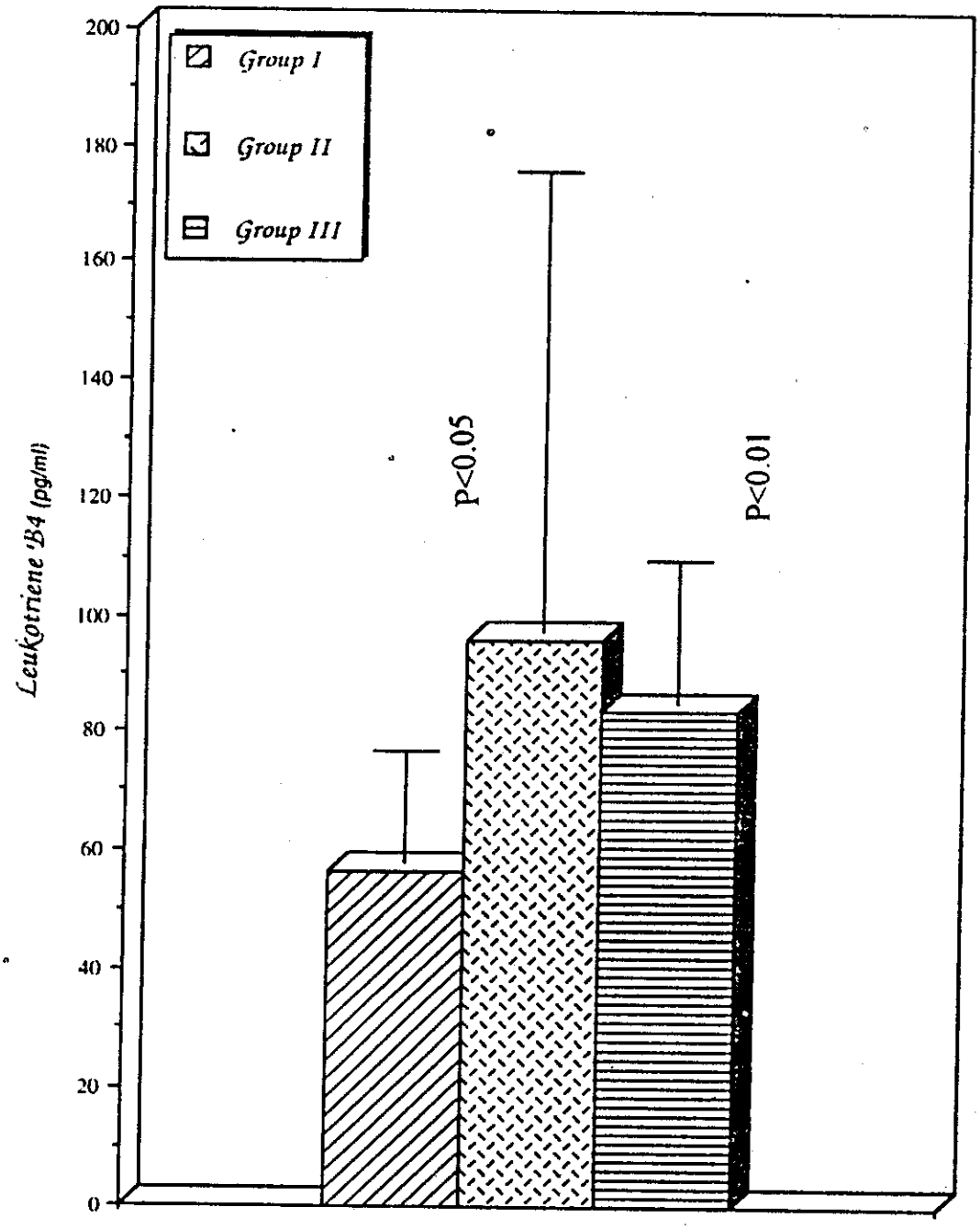
P : Compared to control group .
$P_1$ : Compared to group II
* : Significant .

*Fig ( 7 ) : Descrptive statistics for concentrations ( pg / ml ) of amniotic fluid leukotriene B4 in the three study groups*




Group I : Control elective caesarean section section at term
Group II : Spontaneous vaginal term labor
Group III : Spontaneous preterm labor .

*Fig ( 8 ) Descrptive statistics for concentrations ( pg / ml ) of umbilical cord plasma leukotriene B4 in the three study groups*




**Group I : Control elective caesarean section section at term**
**Group II : Spontaneous vaginal term labor**
**Group III : Spontaneous preterm labor .**

**Table (12) Fig (9):** Show comparative data of amniotic fluid progesterone (ng/ml). The mean value of amniotic fluid progesterone in spontaneous vaginal term labor (group II) was (44.175 ± 27.06) insignificantly decreased than control elective caesarean section at term (group I) was (51.8 ± 28.43 ) ( P>0.05 , Wilcoxon rank sum test ). But the mean value of progesterone in spontaneous preterm labor (group III) . was ( 45.467 ± 28.99 ) insignificantly change than the control group (P > 0.05). Moreover, there was insignificant change in comparison between preterm and spontaneous vaginal term labor (P1>0.05, Wilcoxon rank sum test).

**Table (13) Fig (10) :** Show comparative data of progesterone (ng/ml) in human umbilical cord serum . The mean value of umbilical cord serum progesterone in spontaneous vaginal term labor ( group II ) was ( 329.5± 66.69 ) insignificantly increased than control elective caesarean section at term ( group I ), ( 279.53 ± 88.663 ) (P>0.05). Also, in spontaneous preterm labor ( group III ) the mean value was (266.067± 155.23) insignificantly decreased than control group (P>0.05). Moreover, there was insignificant change, in comparison between preterm and spontaneous vaginal term labor (P1 >0.05, Wilcoxon rank sum test ).

Table (12): Descriptive statistics for amniotic fluid Progesterone( Prog) levels (ng/ml)in
Group I : Control elective caesarean section at term .
Group II : Spontaneous vaginal term labor.
Group III: Spontaneous preterm labor .

| Statistical parameters | Group I | Group II | Group III |
|---|---|---|---|
| No. Observations | 15 | 20 | 15 |
| Mean | 51.8 | 44.175 | 45.467 |
| S.D.± | 28.43 | 27.06 | 28.99 |
| Median | 52 | 36 | 40 |
| P | | >0.05 | > 0.05 |
| $P_1$ | | | > 0.05 |

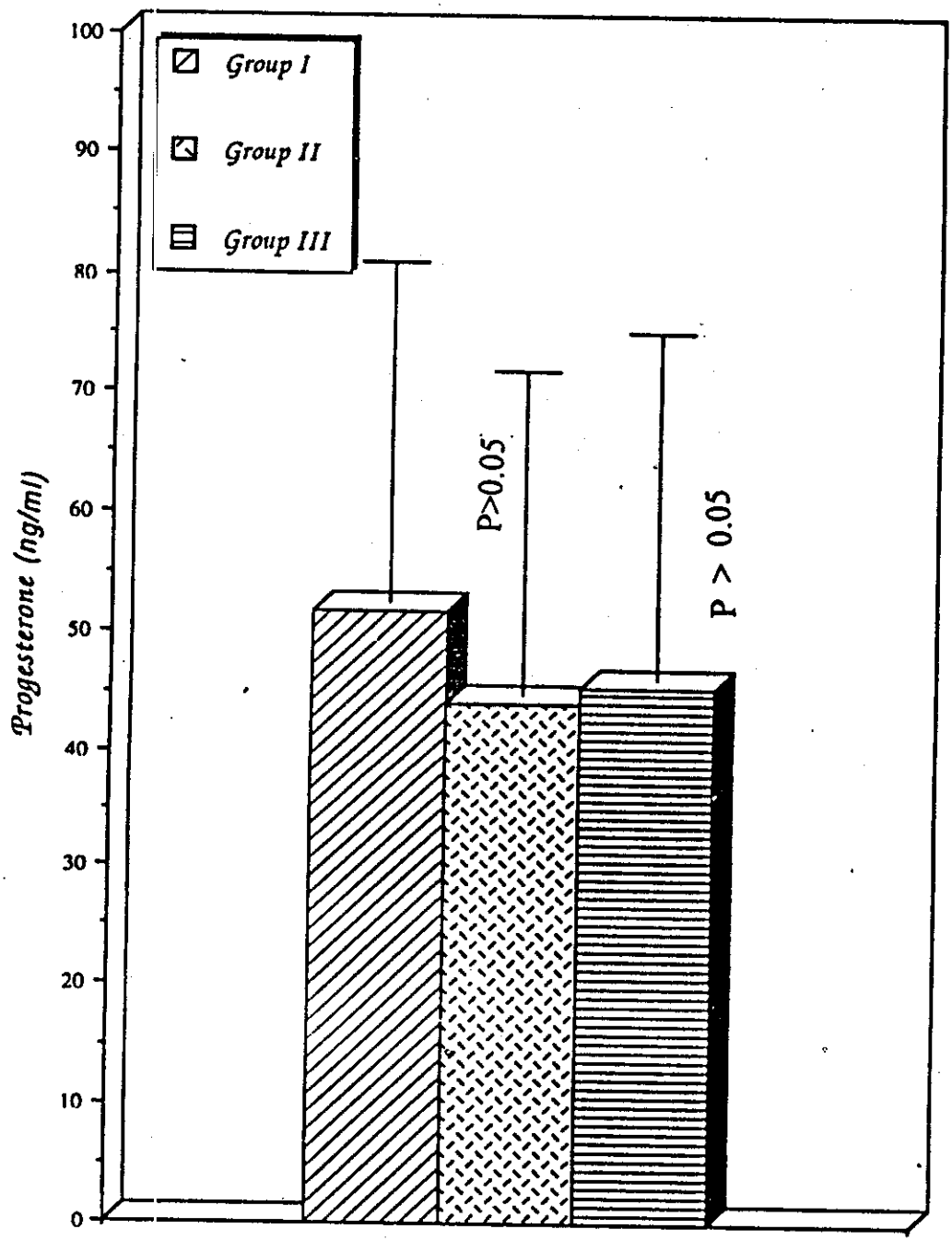
P : Compared to control group .
$P_1$: Compared to group II

Table (13) : Descriptive statistics for umbilical cord serum progesterone (Prog) levels (ng/ml)in :
Group I : Control elective caesarean section at term
Group II : Spontaneous vaginal term labor.
Group III: Spontaneous preterm labor.

| Statistical parameters | Group I | Group II | Group III |
|---|---|---|---|
| No. Observations | 15 | 20 | 20 |
| Mean | 279.53 | 329.5 | 266.067 |
| S.D.± | 88.63 | 66.69 | 155.23 |
| Median | 280 | 335 | 380 |
| P | | >0.05 | > 0.05 |
| $P_1$ | | | > 0.05 |

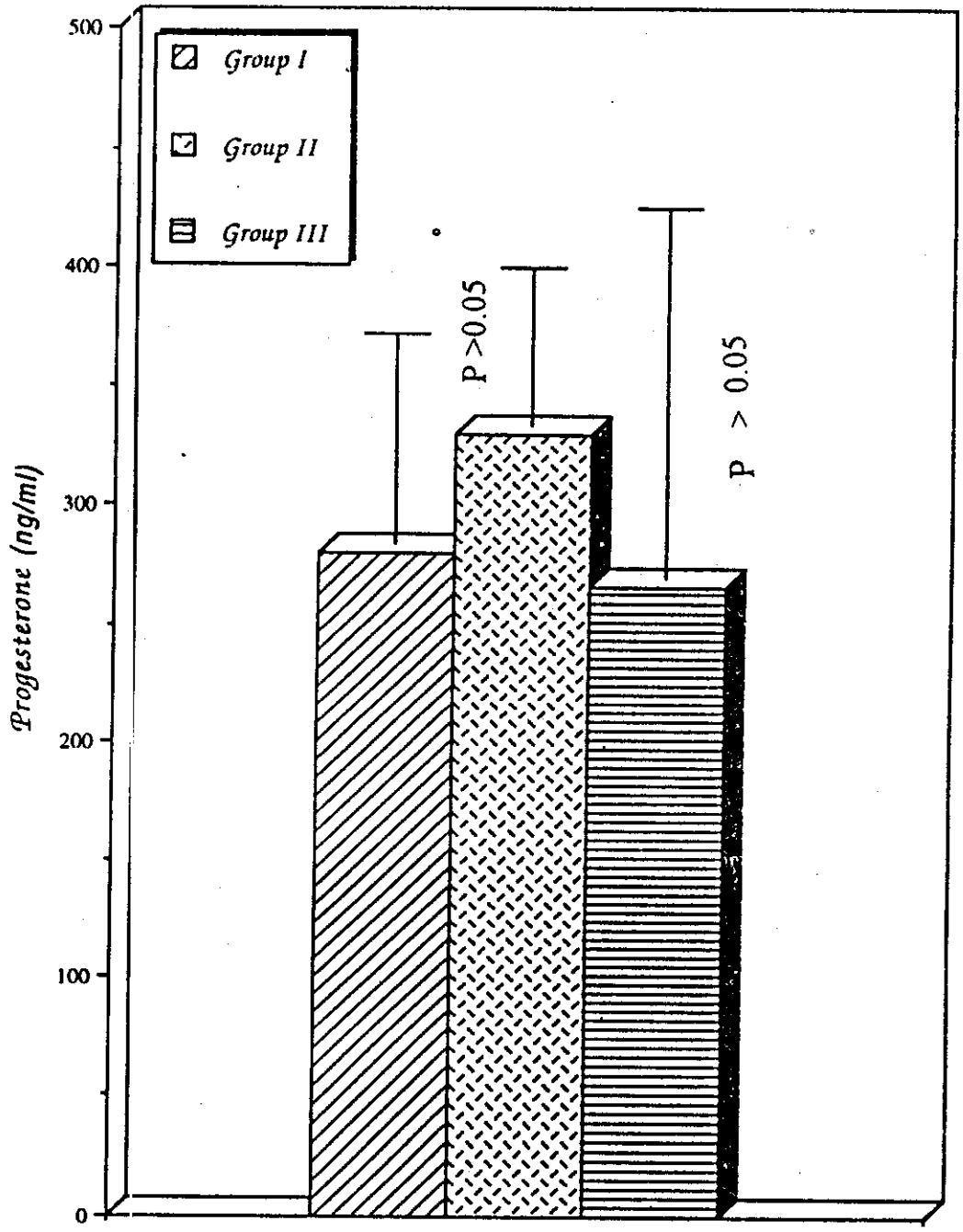
P : Compared to control group I.
$P_1$ : Compared to group II

*Fig ( 9 ) Descrptive statistics for concentrations ( ng / ml ) of amnitotic fluid progesterone in the three study groups .*




**Group I : Control elective caesarean section section at term**
**Group II : Spontaneous vaginal term labor**
**Group III : Spontaneous preterm labor .**

*Fig (10) Descrptive statistics for concentrations ( ng / ml ) of umbilical cord serum progesterone in the three study groups .*




**Group I : Control elective caesarean section section at term**
**Group II : Spontaneous vaginal term labor**
**Group III : Spontaneous preterm labor .**

**Table (14)Fig (11):** Show comparative data of amniotic fluid estradiol (pg/ml). the mean value of amniotic fluid estradiol in spontaneous vaginal term labor ( group II ) was (1698.5 ± 1159.207) significantly increased than control elective caesarean section (group I) (1014 ± 818.193) ( $P<0.05$, Wilcoxon rank sum test). Also in spontaneous preterm labor ( gorup III ) the mean value was (1267.33 ± 1329.127) insignificantly decreased than the control group ($P>0.05$). Moreover, there was insignificant decreased in comparison between preterm and spontaneous vaginal term labor ($P1 >0.05$ , Wilcoxon test).

**Table (15) Fig (12)** Show comparative data of estradiol (pg/ml) in human umbilical cord serum. The mean value of umbilical cord serum estradiol in spontaneous vaginal term labor ( groupII ) was (4635 ± 1566.516) significantly increased than control elective caesarean section (group I ) (3520 ± 1239.93) ($P < 0.05$). Also , in spontaneous preterm labor ( group III ) the mean value was (6320 ± 2007.91) significantly increased than control group ($P <0.001$) . Moreover, there was significant increased in comparison between preterm and spontaneous vaginal term labor ($P1<0.05$) .

Table (14) : Descriptive statistics for amniotic fluid estradiol ($E_2$) levels (Pg/ml)in
Group I : Control elective caesarean section at term .
Group II : Spontaneous vaginal term labor.
Group III: Spontaneous preterm labor .

| Statistical parameters | Group I | Group II | Group III |
|---|---|---|---|
| No. Observations | 15 | 20 | 15 |
| Mean | 1014 | 1698.5 | 1267.33 |
| S.D.± | 818.193 | 1159.207 | 1329.127 |
| Median | 600 | 1350 | 580 |
| P | | <0.05* | > 0.05 |
| $P_1$ | | | > 0.05 |

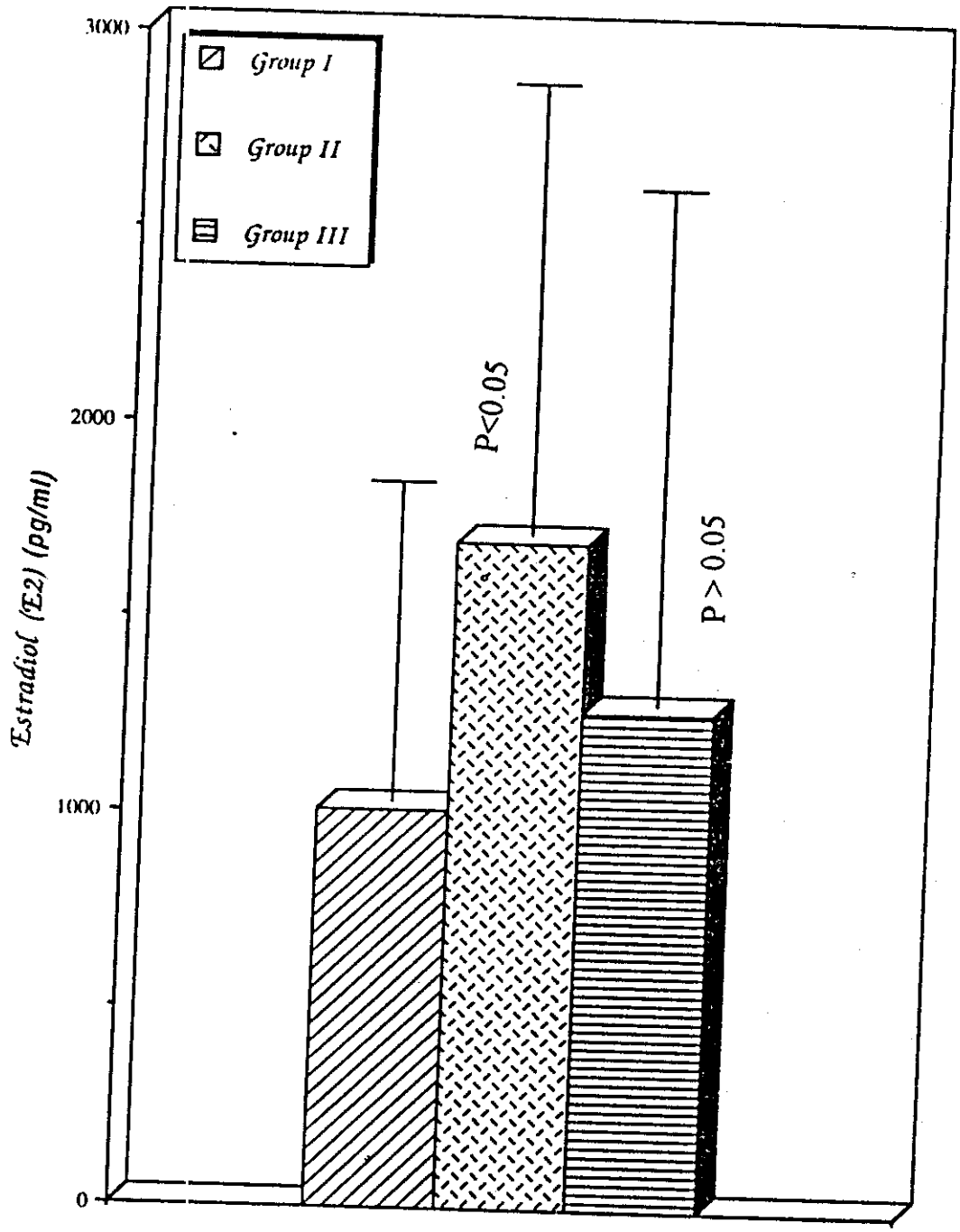
P : Compared to control group.
$P_1$: Compared to group II
* : Significant .

Table (15) : Descriptive statistics for umbilical cord serum estradiol($E_2$) levels (Pg/ml)in
Group I : Control elective caesarean section at term .
Group II : Spontaneous vaginal term labor.
Group III: Spontaneous preterm labor .

| Statistical parameters | Group I | Group II | Group III |
|---|---|---|---|
| No. Observations | 15 | 20 | 15 |
| Mean | 3520 | 4635 | 6320 |
| S.D.± | 1239.93 | 1566.516 | 2007.91 |
| Median | 3500 | 4450 | 6200 |
| P | | <0.05* | < 0.001* |
| $P^1$ | | | > 0.05* |

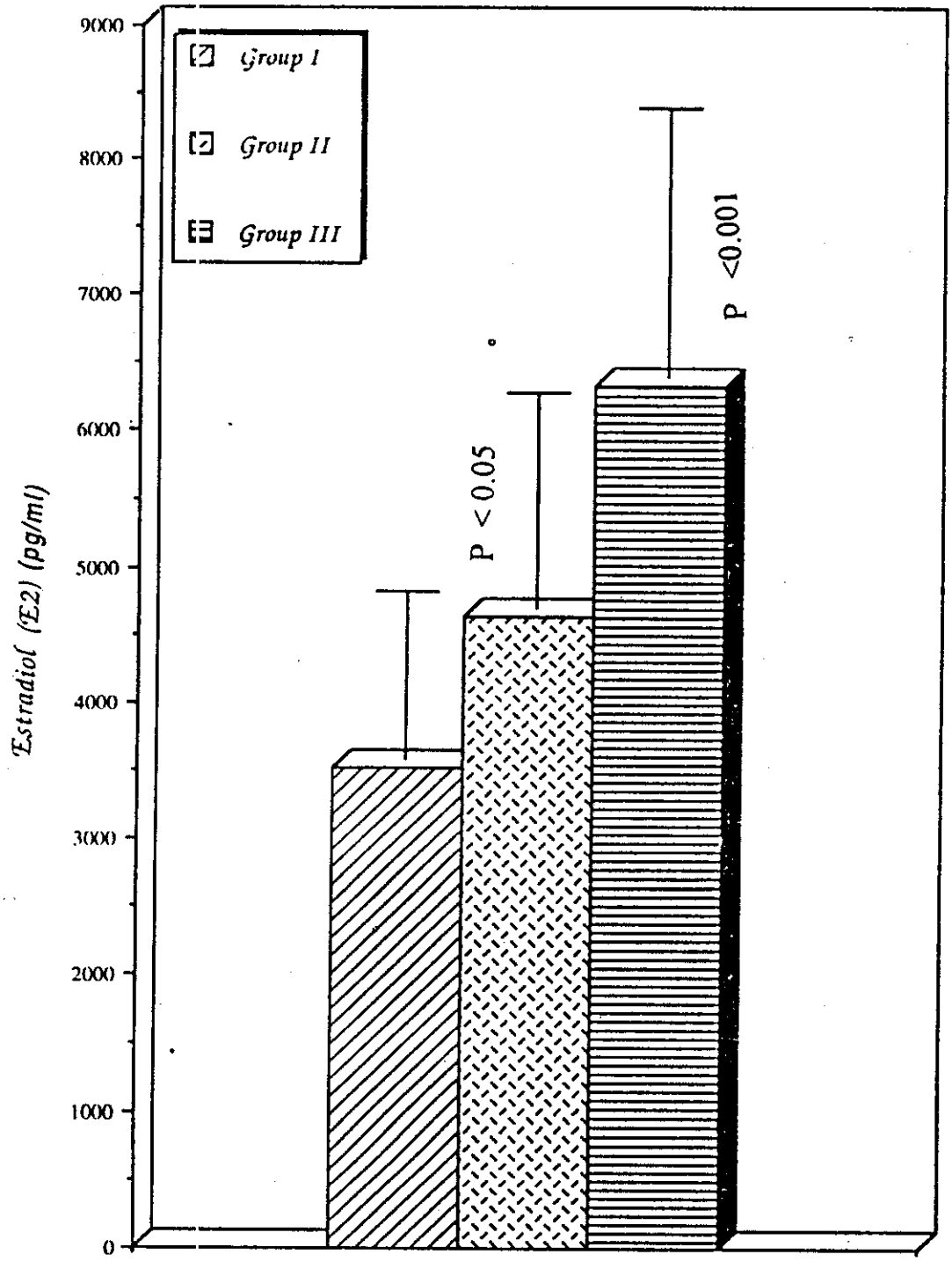
P : Compared to control group.
$P_1$ : Compared to group II
* : Significant .

*Fig (11 ) Descrptive statistics for concentrations ( pg / ml ) of amniotic fluid estradiol ( E2) in the three study groups*




**Group I : Control elective caesarean section section at term**
**Group II : Spontaneous vaginal term labor**
**Group III : Spontaneous preterm labor .**

*Fig ( 12 ) Descerptive statistics for concentrations ( pg / ml ) of umbilical cord serum estradiol ( E2) in the three study groups*




**Group I : Control elective caesarean section section at term**
**Group II : Spontaneous vaginal term labor**
**Group III : Spontaneous preterm labor .**

Table ( 16 ) Collective data of descriptive statistics for the relation between all the biochemical parameters ( Leukotriene B4 ( $LTB_4$ pg/ml ), Progesterone ( prog-ng/ml ) and estradiol ( $E_{2-pg/ml}$ ) in amniotic fluid and umbilical cord blood in control elective caesarean section ( group I ) , spontaneous vaginal term labor ( group II ) and spontaneous preterm labor ( group III ) .

| Groups / Statistical parameters | Elective caesarean section | | Spontaneous vaginal term labor | | Spontaneous preterm labor | |
|---|---|---|---|---|---|---|
| | Amniotic fluid | Umbilical blood | Amniotic fluid | Umbilical blood | Amniotic fluid | Umbilical blood |
| Leukotriene $B_4$ ($LTB_4$) (Mean ± S.D.) | 72.73 ± 59.85 | 56.15 ± 18.57 | 134.78 ± 111.41 | 95.61 ± 78.64 | 51.8 ± 19.99 | 83.43 ± 24.33 |
| n | 15 | 13 | 18 | 18 | 15 | 14 |
| t | 1.018 | | 1.218 | | 3.81 | |
| p | N.S | | N.S. | | <0.001 | |
| Progesterone (Prog) (Mean ± S.D.) | 51.8 ± 28.43 | 279.53 ± 88.63 | 44.18 ± 27.06 | 329.5 ± 66.69 | 45.47 ± 28.99 | 266.07 ± 155.23 |
| n | 15 | 15 | 20 | 20 | 15 | 15 |
| t | 9.48 | | 17.73 | | 5.41 | |
| p | <0.001 | | <0.001 | | <0.001 | |
| Estradiol ($E_2$) (Mean ± S.D.) | 1014 ± 818.19 | 3520 ± 1239.93 | 1698.5 ± 1159.21 | 4635 ± 1566.52 | 1267.33±1329.13 | 6320 ± 2007.91 |
| n | 15 | 15 | 20 | 20 | 15 | 15 |
| t | 6.53 | | 6.74 | | 8.127 | |
| p | <0.001 | | <0.001 | | <0.001 | |

N.S. Non significant

Table (17) & Fig (13) : Show the progesterone / estradiol ratio in amniotic fluid. The mean value ± S.D. of progesterone / estradiol ratio in control elective section at term ( group I ) was 75.28 ± 56.62 , the median was 53.85 . Whereas, the mean value ± S.D. of progesterone / estradiol ratio in spontaneous vaginal term labor ( group II ) was 41.103 ± 36.52 , the median was 26.875. Finally , in spontaneous preterm labor ( group III ) the mean value ± S.D. of progesterone / estradiol ratio was 86.44 ± 84.42 , the median was 54.3 .

Table (18) & Fig (14) : Show the progesterone / estradiol ratio in umbilical cord blood . The mean value ± S.D. of progesterone / estradiol ratio in control elective section at term ( group I ) was 94.396 ± 56.97 , the median was 76.9 . Whereas the mean value ± S.D of progesterone / estradiol ratio in spontaneous vaginal term labor ( group II ) was 78.92 ± 29.51 , the median was 75.3 Finally , in spontaneous preterm labor ( group III ) the mean value ± S.D. of progesterone / estradiol ratio ws 44.35 ± 30.46, and the median was 42.2

Table (17) : Progesterone / estradiol ratio in amniotic fluid in control elective caesarean section at term ( group I ) , Spontaneous vaginal term labor ( group II ) and spontaneous prterm labor ( group III )

| Patients No | Group I | Group II | Group III |
|---|---|---|---|
| 1 | 133.3 | 66.1 | 9.47 |
| 2 | 195 | 10.8 | 268.6 |
| 3 | 12.12 | 58.7 | 68.97 |
| 4 | 20 | 10.7 | 53.3 |
| 5 | 160 | 31.25 | 9.23 |
| 6 | 53.85 | 32.5 | 52.5 |
| 7 | 18.95 | 11.7 | 106.8 |
| 8 | 45 | 22.5 | 38.9 |
| 9 | 104 | 65.5 | 11.8 |
| 10 | 67.4 | 60 | 97.1 |
| 11 | 19.05 | 146.7 | 172.7 |
| 12 | 43.2 | 19.4 | 262.5 |
| 13 | 111.1 | 3.51 | 54.3 |
| 14 | 41.2 | 14.3 | 66.7 |
| 15 | 105 | 7 | 23.8 |
| 16 | — | 56.5 | — |
| 17 | — | 80 | — |
| 18 | — | 90 | — |
| 19 | — | 12.2 | — |
| 20 | — | 22.7 | — |
| No | 15 | 20 | 15 |
| Range | 12.12-195 | 3.51-146.7 | 9.23-268.6 |
| Mean | 75.28 | 41.103 | 86.44 |
| ± S.D. | 56.62 | 36.52 | 84.42 |
| Median | 53.85 | 26.875 | 54.3 |

Table (18) : Progesterone / estradiol ratio in human umbilical serum in control elective caesarean section at term ( group I ) spontanous vaginal term labor ( group II ) and spontaneous preterm labor ( group III )

| Patients No | Group I | Group II | Group III |
|---|---|---|---|
| 1 | 100 | 140.7 | 61.3 |
| 2 | 129 | 50 | 9.4 |
| 3 | 43.1 | 73.1 | 8.7 |
| 4 | 23.6 | 116.1 | 12.6 |
| 5 | 57.5 | 70.5 | 47.1 |
| 6 | 142.9 | 111.4 | 40.8 |
| 7 | 95 | 112.5 | 44.4 |
| 8 | 73.7 | 48.3 | 88.9 |
| 9 | 76.9 | 112.5 | 15.9 |
| 10 | 51.7 | 47.5 | 82.6 |
| 11 | 200 | 100 | 105.3 |
| 12 | 223.1 | 31.4 | 40.9 |
| 13 | 55.6 | 56.5 | 54 |
| 14 | 66.7 | 77.5 | 11.14 |
| 15 | 77.14 | 48.3 | 42.2 |
| 16 | — | 90.5 | — |
| 17 | — | 80 | — |
| 18 | — | 54.3 | — |
| 19 | — | 90.5 | — |
| 20 | — | 66.7 | — |
| No | 15 | 20 | 15 |
| Range | 23.6-223.1 | 31.4-140.7 | 8.7-105.3 |
| Mean | 94.396 | 78.92 | 44.35 |
| ± S.D. | 56.97 | 29.51 | 30.46 |
| Median | 76.9 | 75.3 | 42.2 |

**Fig (13) Progesterone / estradiol ratio in amniotic fluid in control elective caesarean section ( group I ), spontaneous vaginal term labor ( group II ) and spontaneous preterm labor ( group III ). Horizontal bars represent the medians.**

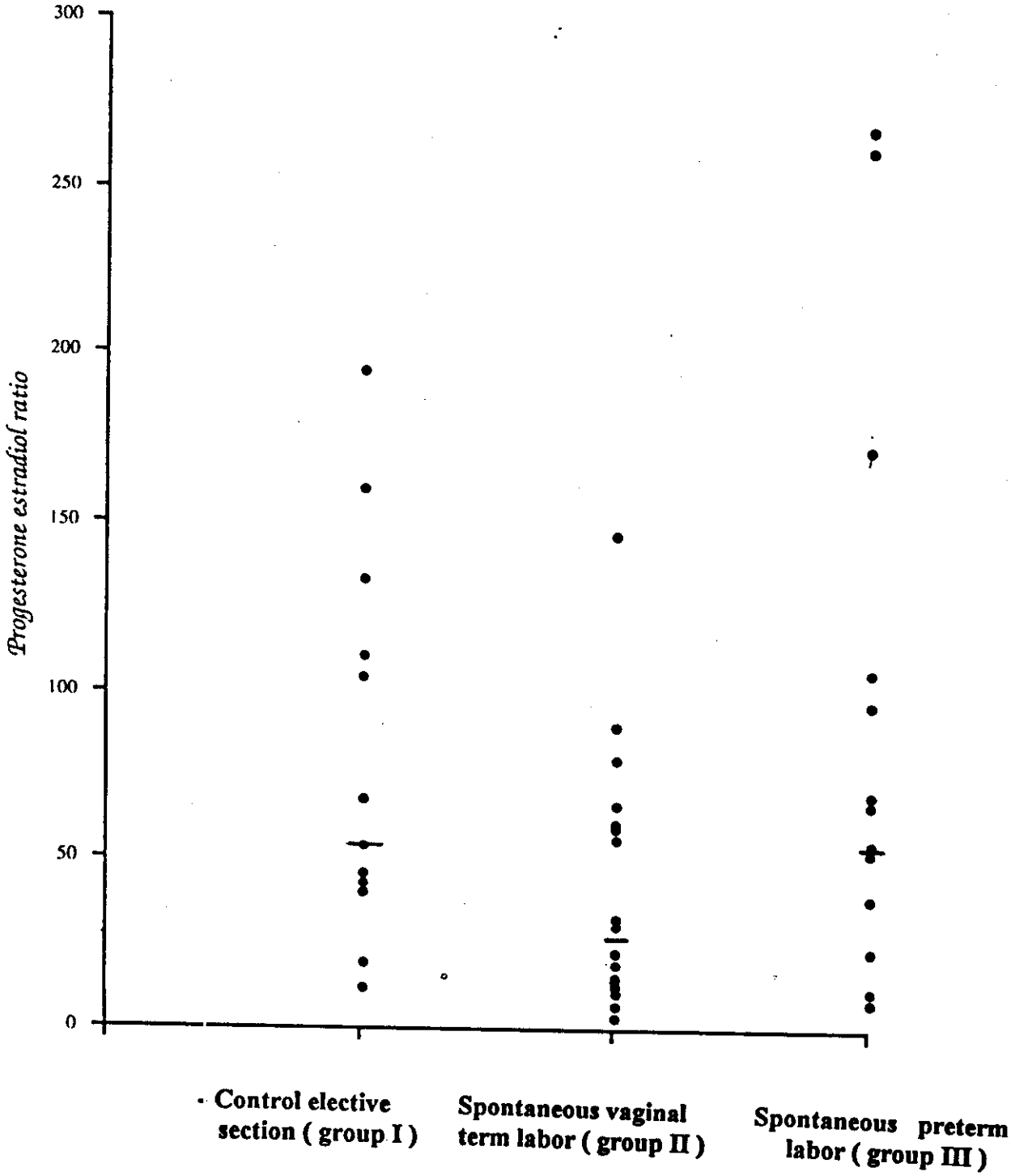
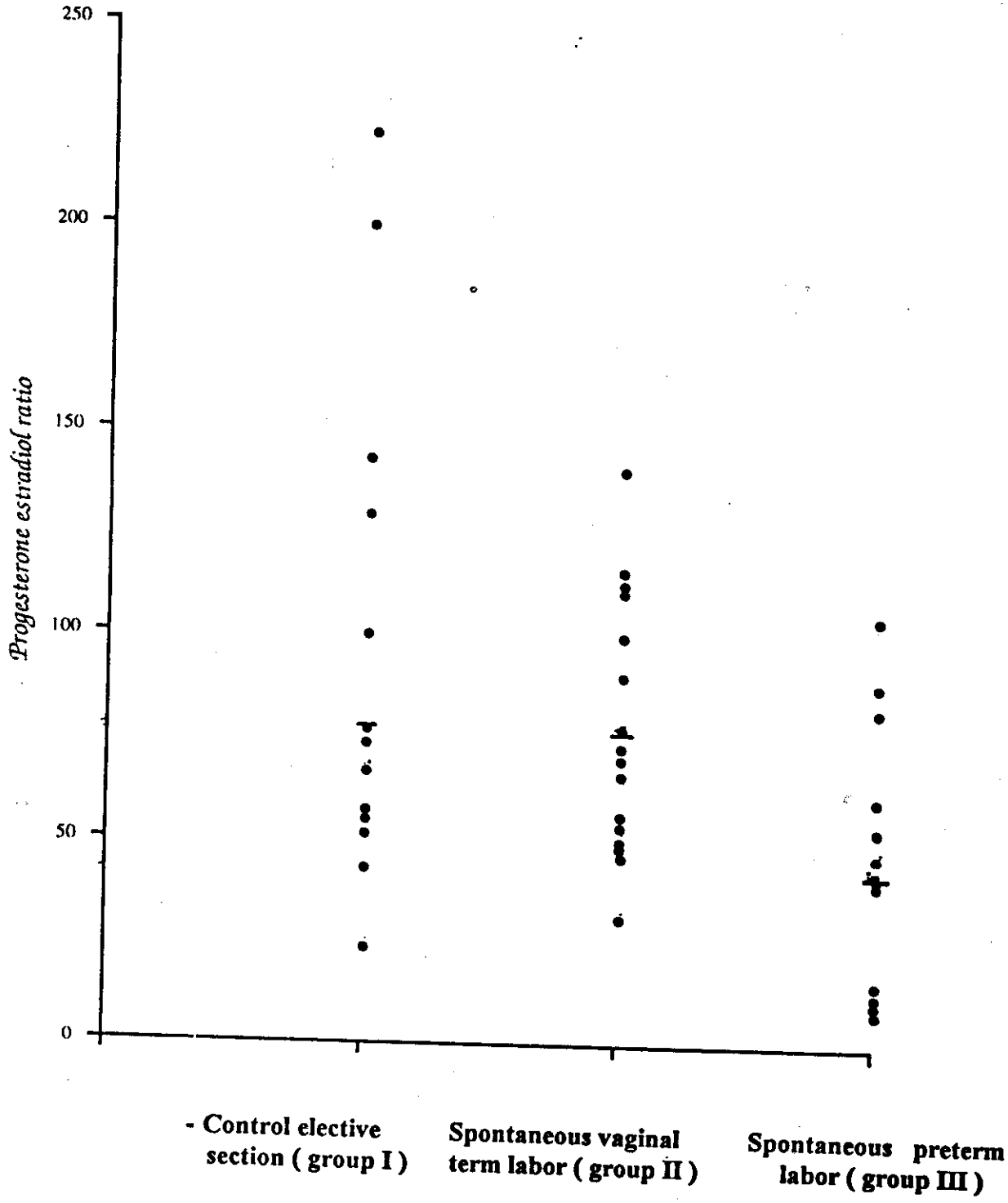


**Fig (14) Progesterone / estradiol ratio in human umbilical cord serum in control elective caesarean section ( group I ), spontaneous vaginal term labor ( group II ) and spontaneous preterm labor ( group III ). Horizontal bars represent the medians.**



## Correlation Studies

**Table (19) & Fig (15,16) Show.**

*In control elective caesarean section ( group I )* there was insignificant correlation between amniotic fluid $LTB_4$ and amniotic fluid progesterone and estradiol ($r = 0.065$, $P>0.05$ & $r=0.313$, $P<0.05$) respectively . Also there was insignificant correlation between umbilical cord plasma $LTB_4$ and umbilical cord serum progesterone and estradiol ($r = 0.012$, $P>0.05$ & $r=0.256$, $P>0.05$ respectivley)

*In spontaneous vaginal term labor (group II)* , there was insignificant correlation between umbilical cord plasma leukotriene $B_4$ ($LTB_4$) and umbilical cord serum progesterone ($r= 0.294$, $P>0.05$). Also, there was insignificant correlation between umbilical cord plasma $LTB_4$ and umbilical cord serum estradiol ($E_2$) ($r=o.176$, $P>0.05$).

Furthermore there was significant positive correlation between amniotic fluid $LTB_4$ on one hand and amniotic fluid progesterone on the other hand ($r= 0.559$, $P<0.01$) . While there was insignificant correlation between amniotic fluid $LTB_4$ and $E_2$ ($r= 0.071$, $P>0.05$).

*In spontaneous preterm labor (group III),* there was insignificant correlation between umbilical cord plasma $LTB_4$ and umbilical cord serum progesterone ($r= - 0.399$, $P>0.05$). Also , there was insignificant correlation between umbilical cord plasma $LTB_4$ and umbilical cord serum estradiol ($E_2$) ($r=-0.358$, $P>0.05$).

However, there was insignificant correlation between amniotic fluid $LTB_4$ on one hand and amniotic fluid progesterone ($r= 0.179$, $P > 0.05$). while , there was significant correlation between amniotic fluid $LTB_4$ and amniotic fluid $E_2$ ( $r= 0.554$, $P>0.05$).

Table (20) Show insignificant negative correlation between leukotriene B4 and Progesterone / estrogen ratio in amniotic fluid in control elective caesarean section ( group I ) , spontaneous vaginal term labor ( group II ) and spontaneous preterm labor ( group III )

( $r = - 0.304$, $p > 0.05$ , $r = 0.241$ , $P > 0.05$ ,
$r = 0.207$ , $P > 0.05$ ) respectively .

Furthermore, there was insignificant negative correlation between leukotriene B4 and Progesterone / estrogen ratio in umbilical cord serum in control elective caesarean section (group I), spontaneous vaginal term labor ( group II ) and spontaneous preterm labor ( group III )

( $r = - 0.215$ , $P > 0.05$ , $r = - 0.198$ , $P > 0.05$ ,
$r = 0.184$, $P > 0.05$ respectively )

Table ( 19 ) Correlation coefficient (r) between leukotriene B4 ($LTB_4$), Progesterone (Prog) and estradiol ($E_2$) in amniotic fluid and umbilical cord blood (plasma & serum)in cases of control elective caesarean section group (I) spontaneous vaginal term labor (group II) and spontaneous preterm labor ( group III )

| Biochemical parameters | $LTB_4$ VS Prog | | $LTB_4$ vs $E_2$ | |
|---|---|---|---|---|
| Groups | amniotic fluid | umbilical cord blood | amniotic fluid | umbilical cord blood |
| Elective caesarean Section | r = 0.065<br>P > 0.05 | r = 0.012<br>p > 0.05 | r = 0.313<br>P > 0.05 | r = 0.256<br>P > 0.05 |
| Spontaneous vaginal term labor | r = 0.559<br>P < 0.01 | r = 0.294<br>P > 0.05 | r = 0.071<br>P > 0.05 | r = 0.176<br>P > 0.05 |
| Spontaneous preterm labor | r = 0.179<br>P > 0.05 | r = 0.399<br>P > 0.05 | r = 0.554<br>P < 0.05 | r = 0.358<br>P > 0.05 |

P < 0.05 Significant
P > 0.05 insignificant

Table ( 20 ) Correlation coefficient ( r ) between leukotriene $B_4$ ( $LTB_4$ ) and progesterone / estradiol ratio in amniotic fluid and umbilical cord blood in control elective caesarean section ( group I ) , spontaneous vaginal term labor ( group II ) and spontaneous preterm labor. ( group III ) .

| Biochemical parameters | $LTB_4$ VS progesterone / estradiol ratio | |
|---|---|---|
| groups | Amniotic fluid | Umbilical cord blood |
| Elective caesarean section | r : - 0.304<br>P : › 0.05 | r : - 0.211<br>P : › 0.05 |
| Spontaneous vaginal term labor | r : - 0.241<br>P : › 0.05 | r : - 0.198<br>P › 0.05 |
| Spontaneous preterm labor | r : - 0.207<br>P : ›0.05 | r : - 0.184<br>P › 0.05 |

P › 0.05 non significant

**Fig.(15):Correlation coefficient "r" between leukotriene B4 and progesterone in amniotic fluid in spontaneous vaginal term labor (group II )**

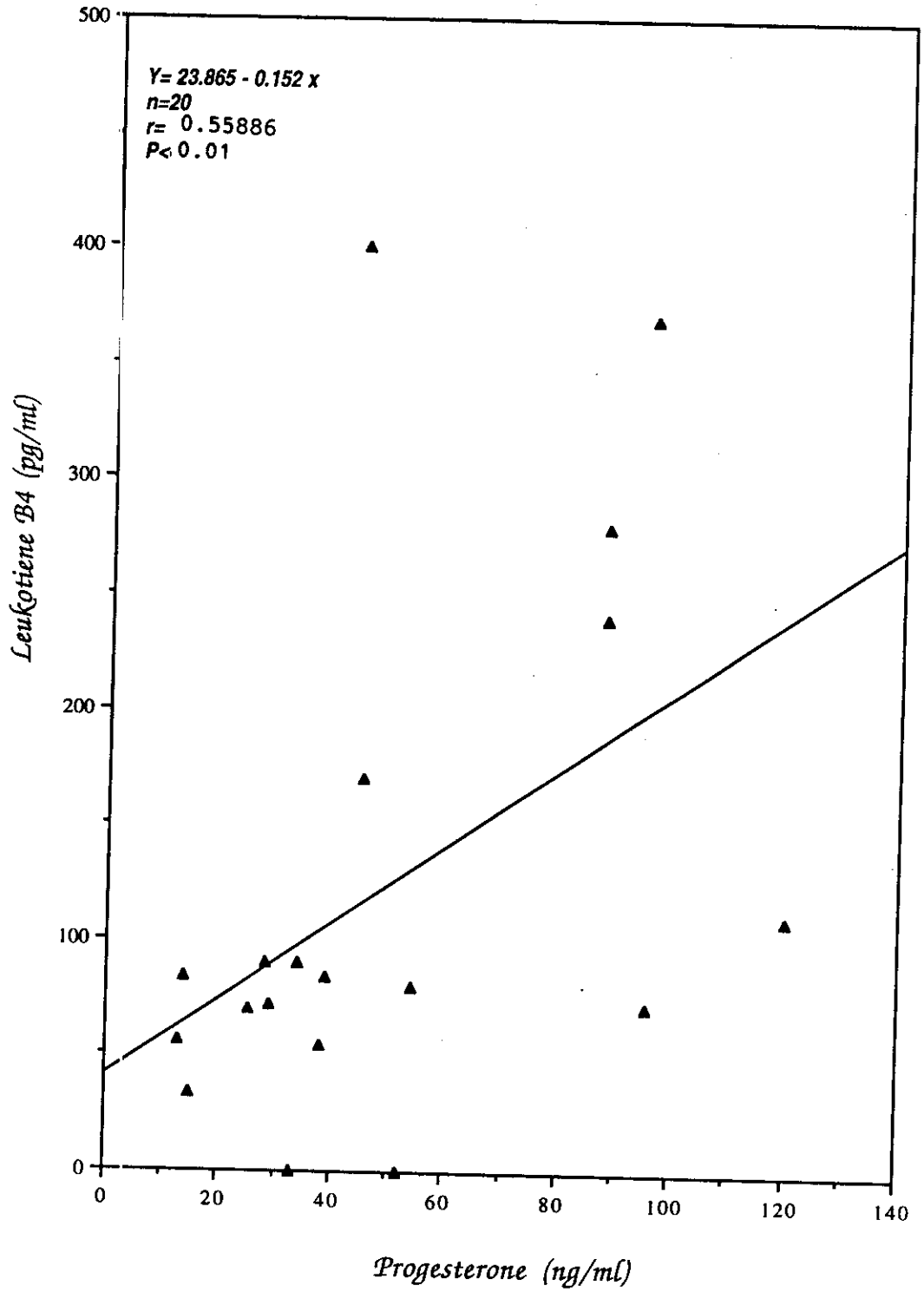
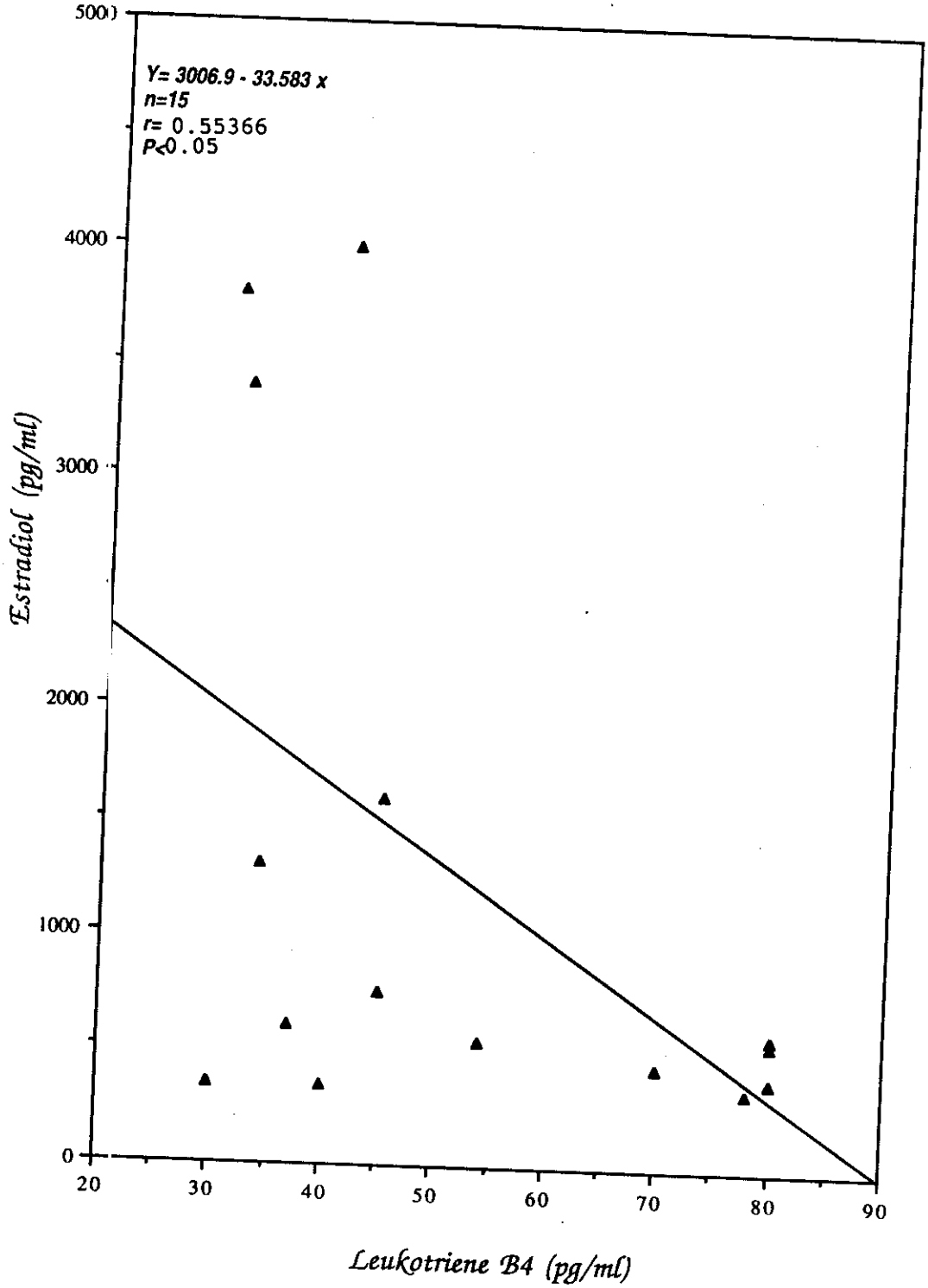


**Fig . (16) : Correlation coefficient "r" between leukotriene B4 and estradiol in amniotic fluid in spontaneous preterm labor ( group III ) .**



# Discussion

The initiation of human labor is associated with the mobilization of arachidonic acid from fetal membranes *( Okita et al ., 1982 )*. Arachidonic acid can be metabolized via both the cyclooxygenase pathway to prostaglandins and thromboxanes, and the lipoxygenase pathway to a variety of products that include leukotrienes *( Mitchell , 1986 ).*

Arachidonate lipoxygenase products, including leukotriene B4 have been found to be involved in the development of uterine contractions and they may participate in the normal process of labor or in the mechanism of labor that is associated with or the result of an inflammatory reaction *( Ritchie et al ., 1984 )*.

For the fetus , one of the important aspects of intrauterine life is its dependency on the effective exchange of nutritive and metabolic products with the mother . The methods by which a fetus can influence its own growth and development involve a variety of messages transmitted, in many cases, by hormones . Hormonal messengers from the conceptus can affect metabolic processes, uteroplacental blood flow, and cellular differentiation . Furthermore, a fetus may signal its desire and readiness to leave the uterus by hormonal initiation of parturition *( Speroff et al ., 1989 )*.

It is helpful to view the steroidogenesis as consisting of a fetal compartment, a placental compartment and a maternal compartment. Separately the fetal and placental compartments lack certain steroidogenic activities. Cholesterol as well as pregnanolone are obtained from the maternal blood stream for progesterone synthesis and the fetal contribution is negligible. While the basic precursors of estrogens are 19- carbon androgens. The androgen compounds utilized for estrogen synthesis in human pregnancy are derived from the maternal blood stream in early months of gestation , but by 20th week of pregnancy , the vast majority of estrogen is derived from fetal androgens and the maternal contibution must be negligible ***( Speroff et al., 1989 ).***

Although a direct effect of steroid hormones on the initiation of labor has been shown in animals conclusive data on human parturition are lacking ***(Keresztes et al., 1988).*** However, the steroid hormone are involved in human parturition , estrogen and progesterone hormones play only a facilitatory role in the initiation of labor ***(Fuchs and Fuchs, 1984)***.

In this study we try to find the role of leukotriene $B_4$ ( $LTB_4$ ) , estradiol ( E2 ) and progesterone ( prog ) and its interrelationships, in elective caesarean section , full term and preterm spontaneous vaginal delivery. These parameters were studied in amniotic fluid and cord blood samples .

Our results showed, in control elective caesarean section and spontaneous vaginal term labor, insignificant increase between amniotic fluid and umbilical blood $LTB_4$ and significant decrease between amniotic and umbilical blood $LTB_4$ in spontaneous preterm labor ( $P > 0.005$ , $P > 0.05$ and $P < 0.001$ respectively ) ( Table 16 ). The insignificant increase in the first two groups at term may be due to difference in origin or source of each of amniotic fluid and umbilical cord blood, since the first is of both maternal and fetal origin , while the latter is mainly of fetal origin ***( Lewis and Chamberlain, 1990 )***. However, the opposite result occur in spontaneous preterm labor which may be explained by the difference in metabolism of arachidonic acid via cyclo-and lipoxygenase pathways in term and preterm labor and these results indicates some " maturational " change towards term ***(Lopez- Bernal et al., 1990)***.

Also , our data revealed significant increase between umbilical cord blood and amniotic fluid for each of estradiol and progesterone in elective section group , spontaneous term and preterm labor ($P<0.001$ , $P < 0.001$ , $P < 0.001$ respectively ) ( Table 16 ). These increase in estradiol level between umbilical cord blood and amniotic fluid may be due to that the fetal contribution to total estrogen synthesis involve the most or major role while maternal contribution must be negligible because in the absence of normal fetal adrenal glands ( as in an anencephalic infant ) maternal estrogen levels and excretion are

extremely low . The fetal adrenals secrete more than 200 mg of DHAS daily , about 10 times more than the mother ***( Madden et al., 1978 )***. While the significant increase between umbilical and amniotic fluid progesterone may be due to the fact that the majority of placental progesterone is derived from maternal cholesterol , while the fetal contribution to progesterone synthesis is negligible. In addition , large proportion of progesterone elaborated by the placenta goes to the fetus where it is degraded ***(Hellig et al., 1970 )***.

Our results revealed a marked elevation of amniotic fluid concentration of $LTB_4$ in spontaneous vaginal term labor than control elective section group , as the mean value ( Table 10 ) was significantly increased ( $P < 0.05$ ) . These finding supported the studies of ***Novy***, and ***liggins(1980), Romero et al.(1987a), Mitchell (1986)*** and ***Pasetto et al., (1992)*** who found that spontaneous active labor at term was associated with increased levels of $LTB_4$ and PGs in amniotic fluid and other lipoxygenase products (12 - HETE , 15 HETE and LTC4 ) compared with women not in labor ( elective section group ) . Their data suggested an overall increase in the metabolism of arachidonic acid through both lipoxygenase and cyclooxygenase pathways during normal parturition at term .

Also, ***Haluska et al . (1990),*** suggested that a significant increase in amniotic fluid LTB4 and 5-HETE concentrations occurs

prior to spontaneous vaginal delivery in rhesus monkeys much as has been previously reported in laboring women at term *( Romero et al., 1987a).*

But, our results showed disagreement with those of ***Elliott et al. (1984) , Myatt et al . (1985 ) and Bennett et al. (1987 b )*** who reported that there is a reduction in lipoxygenase activity in both term and preterm labor and the ratio of lipoxygenase products to cyclooxy genase products is shifted toward cyclooxygenase products during labor .

Our finding could be explained by the fact that the leukotriene $B_4$ has few direct muscle stimulating action , but it is possible that it contributes indirectly because it can mobilize calcium and stimulate phospholipase $A_2$ activity leading to prostaglandin formation which is important agent for initiation of labor *( Lewis and Austen, 1984* and ***Bernal et al., 1989 )*** . Also , leukotrienes have little oxytocic effect *(Bernal et al., 1989 ).*

Morever, this compound has potent biologic activities , such as affecting chemokinetic and chemotactic actions on leukocytes, increasing vascular permeability and inducing contraction of smooth muscle of the uterus *( Ritchie et al., 1984 )*. Furthermore, both cyclo and lipoxygenase increase in amniotic fluid in spontaneous full term labor and arachidonate lipoxygenase metabolites can regulate the

production of cyclooxygenase pathway products by stimulating the release of prostaglandin and thromboxanes. ***( Folceo et al., 1981 )***.

In spontaneous preterm labor, our data showed that the amniotic fluid $LTE_4$ value was insignificantly decreased than control elective section group but significantly decreased than spontaneous vaginal term labor ( $P > 0.05$ , $P < 0.05$ respectively ) ( Table 10 ). These results were in agreement with the results of ***Romero et al. (1987b), Lopez- Bernal et al. (1990) and Romero et al. (1989b)***, as they reported that there was low amniotic fluid concentration of $LTB_4$ and other lipoxygenase products such as 12 - HETE and 15- HETE in women with uncomplicated spontaneous preterm labor than full term labor.

Our finding could be explained by the fact that there is low level of lipoxygenase metabolites and prostaglandins metabolites in amniotic fluid of preterm than term labor ***(Keirse, 1979, Romero et al., 1987a, Seller et al., 1981 and Tamby -Roja et al., 1977)***. Also there is less prostaglandin E production by amniotic cell in preterm than full term labor ***( Lopez- Bernal et al., 1987 )***. Morever, maturational event may account for this difference in the release of $LTB_4$ and other lipoxygenase products into amniotic fluid and evidence supporting this concept is that many women with preterm premature rupture of membranes had nondetectable concentrations of $LTB_4$ and that all nonlaboring women at term with intact membranes had detectable concentrations of $LTB_4$ ***(Romero et al., 1987b).***

These explaination raise the possibility that the mechanism which initiates preterm labor in the absence of obvious pregnancy complications may differ to some extent from that which regulates the onset of labor at term *( Lopez Bernal et al., 1987 )*.

As regard the cord blood , our results showed that $LTB_4$ was significantly higher in those of spontaneous vaginal term labor than of control elective caesarean section group [ $P < 0.05$ - Table ( 11 ) ] . These findings confirmed the studies of ***Pasetto et al. (1989) and Lopez - Bernal et al. ( 1990 )*** who noted that the placental and umbilical cord plasma level of $LTB_4$ output of infant born after spontaneous term labor were higher than infant born by elective caesarean section before labor . This suggest that the placenta may be the source of the raised $LTB_4$ levels found in cord blood and amniotic fluid of women in labor .

As regard the amniotic fluid concentration of estradiol and progesterone in spontaneous vaginal term labor and elective caesarean section at term , our data showed that amniotic fluid progesterone in spontaneous vaginal delivery was insignificantly decreased than control elective section , while amniotic fluid estradiol in spontaneous vaginal delivery was significantly increased than control elective section ( $P > 0.05$ , $P < 0.05$ - Table 12 and Table 14 respectively ) .

These finding supported the studies of *Siiteri & Seron- Ferre , (1981 ), Walsh et al. (1984 ) Romero et al .(1988a), and Mazor et al. (199.1)* who found that an increase in the amniotic fluid concentration of estrogens (estradiol) and no significant changes in amniotic fluid concentration of progesterone between two groups during parturition . Their data suggested that although progesterone withdrawal may occur at a local tissue level, parturition occured without an apparent decrease in circulating maternal , or circulating fetal progesterone and estrogen concentrations neither at term nor in preterm labor. However, there is increasing evidence that amniotic fluid or local tissue concentrations of steroid hormones are more important than circulating hormones in stimulating prostaglandins production by amnion , chorion , or decidua and thus in promoting uterine contraction

Our finding could be explained by proposing that the changes in steroid hormone concentrations occur locally within intrauterine tissues and are not reflected systemically *( Mitchell et al.,1984 )*. Other investigators suggested that differnt intrauterine tissues, such as fetal membranes and decidua are actively involved in the production and metabolism of estrogen and progesterone *( Olson et al., 1983 and Schatz and Gurpide , 1983 )* . According to these data , it has been speculated that paracrine or autocrine secretion of the steroids occurs within the intrauterine tissues during parturition *(Mitchell et al., 1987)*

The steroid events in human pregnancy are somewhat similar to events in the ewe . In any case the endocrine factors bearing on the onset of labor are produced from within the feto-placental unit . In sheep the direct synthesis of progesterone does not decline, but increased metabolism to a 17 - hydroxylated product results in less available progesterone . Progesterone withdrawal is associated with a decrease in the resting potential of myometrium , i.e., an increased response to electric and oxytocic stimuli ***( Klopper, 1991 )*** .

Dihydroxyprogesterone also serves as a precusor for the rise in estrogen levels which occurs a few days prior to parturition . Thus progesterone withdrawal and estrogen increase lead to an enhancement of conduction and excitation . The final event is arise in $PGF_{2\alpha}$ and leukotrienes production hours before the onset of uterine activity ***( Mazor et al., 1993 )*** .

Changes in intrauterine steroid concentrations may alter in a paracrine way the biomolecular events related to parturition . So, rising concentration of amniotic fluid estrogens would promote local progesterone withdrawal and would amplify the effect of circulating estrogens in stimulating prostaglandins production ***( Mitchell et al., 1982 )*** .

As regard the cord blood , our study showed that progesterone in spontaneous vaginal term labor was insignificantly increased than

control elective section group , while estradiol in spontaneous vaginal delivery was significatly increased than control section group ( $P > 0.05$ , $P < 0.05$ respectively ) ( Table 13 and 15 ) .

These results were in agreement with the results of ***Challis et al . (1971) , Darwood and kelmkamp (1977) and Keresztes et al . (1988 )*** who found no difference in umbilical cord serum progesterone levels when comparing fetuses delivered by elective caesarean section with those delivered after spontaneous labor . While our results concerning the significant increase in umbilical cord blood estradiol were in agreement with the results of ***Patten et al. (1973) , Shearman et al .(1974) , Smith et al .(1975)*** and ***Keresztes et al .(1988)***, who suggested that $E_2$ levels in laboring women were significnatly elevated in umbilical cord serum than non - laboring women . Thus the initiation of labor in human is clearly associated with an increase in estradiol rather than a decrease in progesterone .

Our data strongly support a modulating role for alterations in steroid hormones at the onset of human labor by suggesting that, the increase in estrogen rather than the classic " withdrawal " as the prime factor in estradiol / progesterone ratio , changes associated with labor ***( Keresztes et al ., 1988 )*** . The stimulus for the rise in fetal and maternal estrogens before parturition is not known , but functioning fetal adrenal glands are required because the prepartum estrogen increases are absent when the fetus is dead or functionally

hypophysectomized *(Novy and Walsh , 1983)*. In addition, there is abundant evidence that monkey fetuses, like human fetuses can influence estrogen biosynthesis by producing adrenal androgens that undergo placental aromatization *(Walsh et al., 1980)*. However, from the evidence available, there is no really convincing and confirmed evidence of a fall in progesterone level either in the maternal or fetal compartment before the onset of labor.

As regard progesterone / estradiol ratio , our results showed changes in this ratio associated with parturition . This was similar to that reported by ***Romero et al. (1988a), Keresztes et al. (1988) and Mazor et al. (1993)*** who concluded that the biochemical events associated with human parturition are modulated by a local change in the progesterone / estrogen ratio .

The possible causes for this change in progesterone / estradiol ratio may be due to the changes in estrogen and in progesterone relative to each other, rather than an absolute fall in progesterone and this is essential for triggering labor ***(Kauppila et al ., 1980*** and ***Keresztes et al., 1988 )***.

In correlation study there was significant postitive correlation between amniotic fluid $LTB_4$ and amniotic fluid progesterone in spontaneous vaginal term labor( r : 0.559 , $P < 0.01$ - Table 19 ) . Also , there was significant positive correlation between amniotic fluid

LTB4 and amniotic fluid $E_2$ in spontaneous preterm labor ( $r = 0.554$ , $P < 0.05$ - Table 19 ).

These data was in agreement with the results of ***Haning and Meier (1984)*** and ***Hahn et al. (1985)*** who found that both leukotrienes and prostaglandins induced uterine contractions are influenced by changing concentration of both progesterone and estradiol . These findings may have applicability in the clinical cases of dysmenorrhea, initiation of parturition .

We conclude that the physiology of labor is associated with the local changes in steroid hormones ( estrogen and progesterone ) relative to each other, rather than an absolute fall in progesterone . Peripheral Ovarian steroids may regulate the levels of leukotrienes and prostaglandins by shunting arachidonic acid metabolism from one pathway to other . So a possible involvement of leukotriene $B_4$ in biochemical and metabolic events of human parturition is suggested.