# Results

**CLINICAL DATA**

Table 1a shows the range and mean (± SD) of the age, weight and gestational age, while table 1b shows the range and mean ( ± SD) of systolic, diastolic and mean arterial blood pressure in the three study groups.

Table 1a shows that the mean maternal weight was significantly higher in the mild PIH group,compared to normal pregnancy group and severe PIH group (P <0.001).

Table 1b shows that there was no statistically significant difference between mean arterial blood pressure in normal pregnancy and mild PIH, but it was significantly higher in severe PIH compared to mild PIH and normal pregnancy.

**Table 1a:Range and mean (± SD) age, weight and gestational age in the three study groups.**

| Parameter | Group I (Normal Pregnancy) | Group II (Mild PIH) | Group III (Severe PIH) | P Value |
|---|---|---|---|---|
| **Age :** (years) | | | | |
| Range | 20-29 | 20-32 | 29-33 | I : II N.S. |
| Mean | 24.10 | 25.26 | 24.50 | I : III N.S. |
| S D ± | 3.100 | 3.814 | 4.232 | II : III N.S. |
| **Weight :** (Kgm) | | | | |
| Range | 59-85 | 58-88 | 65-86 | I : II< 0.001 |
| Mean | 71.366 | 77.733 | 71.9 | I : III N.S. |
| S D ± | 8.499 | 5.534 | 5.701 | II : III<0.001 |
| **Gest age** (Weeks) | | | | |
| Range | 30-40 | 32-40 | 30-38 | I : II N.S. |
| Mean | 35.30 | 35.266 | 34.566 | I : III N.S. |
| S D ± | 3.185 | 2.434 | 2.207 | II : III N.S. |

Table 1b:Range and mean (± SD) systolic, diastolic, and mean arterial blood pressure in the three study groups.

| Blood pressure | Group I (Normal Pregnancy) | Group II (Mild PIH) | Group III (Severe PIH) | P value |
|---|---|---|---|---|
| **Systolic** | | | | |
| Range | 100-140 | 140-150 | 160-210 | I : II <0.001 |
| Mean | 120.333 | 145.33 | 173.666 | I :III <0.001 |
| S D ± | 10.661 | 5.5.071 | 16.078 | II :III <0.001 |
| **Diastolic** | | | | |
| Range | 60-90 | 90-100 | 110-150 | I : II <0.001 |
| Mean | 78.33 | 95.83 | 118 | I :III <0.001 |
| S D ± | 7.914 | 4.927 | 11.861 | II :III <0.001 |
| **Mean arterial** | | | | |
| Range | 83.3103.3 | 106.66-116.66 | 126.66-153.33 | I : II N.S |
| Mean | 122.33 | 152.33 | 176.77 | I :III <0.001 |
| S D ± | 27.300 | 30.49 | 39.73 | II :III <0.001 |

In the 30 patients with severe PIH, there were symptoms and signs of eminent eclampsia in 18 patients (60%). In 14 of these 18 patients, there were more than one sign and/or symptom.

Table (2): Symptoms and signs of eminent eclampsia in 18 patients with severe PIH.

| Symptoms and Signs | No. | % |
|---|---|---|
| **Symptoms :** | | |
| Headache | 18 | 100% |
| Epigastric Pain | 12 | 66% |
| Visual disturbance | 5 | 27% |
| Vomiting | 5 | 27% |
| **Signs :** | (6) | |
| Jaundice | 4 | 22% |
| Tender liver | 2 | 11% |
| **Combined symptoms and Signs** | (14) | |
| Headache + Vomiting | 3 | 16% |
| Headache + epigastric pain | 5 | 27% |
| Headache + visual disturbance | 1 | 0.05% |
| Multiple symptoms | 5 | 27% |

Table 3 shows the grades of oedema and albuminuria in patients with mild and severe PIH.

Table 3:Grades of oedema and albuminurea in mild and severe PIH.

| Parameter | Mild PIH (n = 30) | | Severe PIH (n = 30) | |
|---|---|---|---|---|
| Oedema : | | | | |
| Nil | 9 | (30%) | 0 | - - |
| + | 8 | (26%) | 0 | - - |
| + + | 13 | (43%) | 7 | (23%) |
| + + + | 0 | | 23 | (76%) |
| **Albuminuria :** | | | | |
| + | 10 | (33%) | 0 | - - |
| + + | 20 | (66%) | 0 | - - |
| + + + | 0 | - - | 19 | (63%) |
| + + + + | 0 | - - | 11 | (36%) |

LABORATORY RESULTS

Table 4 shows the range, mean, (± SD) of platelet count, serum creatinine, SGOT, and LDH in the three study groups.

Table 4 :Range, and mean, (± SD) of platelet count, serum creatinine, SGOT, and LDH .

| Parameter | Group I (Normal Pregnancy) | Group II (Mild PIH) | Group III (Severe PIH) | P Value |
|---|---|---|---|---|
| **Platelet count(/cumm)** | | | | |
| Range | 170.000-250.000 | 139.000-259.000 | 90.000-170.000 | I:II <0.001 |
| Mean | 212.333 | 193.166 | 121.700 | I:III<0.001 |
| S D ± | 33315.316 | 32528.06 | 26947.1 | II:III<0.001 |
| **Serum creat-inine(mg/dl)** | | | | |
| Range | - - | 0.8-1.8 | 1.1-2 | |
| Mean | - - | 1.796 | 1.623 | N.S. |
| S D ± | - - | 2.895 | 0.299 | |
| **SGOT (U/L)** | | | | |
| Range | 4-27 | 19-78 | 21-141 | I:II <0.001 |
| Mean | 13.062 | 32.466 | 43.266 | I:III<0.001 |
| S D ± | 6.407 | 10.997 | 33.105 | II:III<0.001 |
| **L D H (U/L)** | | | | |
| Range | 100-210 | 113-290 | 178-590 | I:II <0.001 |
| Mean | 137.321 | 182.366 | 376.267 | I:III<0.001 |
| S D ± | 31.08 | 49.278 | 94.105 | II:III<0.001 |

This table shows that the mean platelet count in mild PIH was significantly lower than that in normal pregnancy (P<0.001) and in severe PIH was lower than that in normal and in mild PIH. (P<0.001). There was no statisticaly significant difference between mean serum creatinine levels in mild and severe PIH. On the other hand,the mean serum SGOT and LDH were significantly more in severe PIH compared to mild PIH (P<0.001) and to normal pregnancy (P <0.001) and in mild PIH compared to normal pregnancy (P<0.001).

## THROMBOCYTOPENIA

This means that the platelet count was less than 150,000/cu mm. In mild PIH group, 6 cases were detected (20%) and in severe PIH group, 24 cases were detected (80%), (P<0.001). Out of these 24 cases, 13 cases (54%), had severe thrombocytopenia (i.e. platelet count less than 100,000).

Table 5 : shows the clinical characterestics and laboratory findings of the 6 cases with thrombocytopenia in mild PIH gruop.It shows that all the 6 patients had no complaints, their blood pressure did not exceed 150/100, mm Hg, oedema and albuminuria were no more than (++), platelet count was not less than 139,000, serum creatinine level was increased (normal value up to 0.9 mg/100ml), there was elevated level of SGOT (normal value up to 12 U/L) and elevated level of LDH (normal value up to 240 U/L), and there was no evidence of haemolysis.

**Table 5 : Characteristics of patients with thrombocytopenia in mild PIH group.**

| Case No. | Compl-aint | Blood press. (mm/Hg) | Oed-ema | Albu-min | Plat-elet (/cumm) | Creat inine (mg/100ml) | SGOT (U/L) | LDH (U/L) | Haemo-lysis |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Nil | 150/100 | + + | + + | 150.000 | 1.7 | 78 | 290 | Nil |
| 2 | Nil | 150/100 | Nil | + + | 139.000 | 1.7 | 41 | 266 | Nil |
| 3 | Nil | 150/100 | + + | + + | 150.000 | 1.7 | 33 | 238 | Nil |
| 4 | Nil | 150/100 | Nil | + + | 139.000 | 1.7 | 41 | 200 | Nil |
| 5 | Nil | 150/90 | + + | + + | 150.000 | 1.8 | 41 | 238 | Nil |
| 6 | Nil | 150/90 | + + | + + | 150.000 | 1.7 | 200 | 33 | Nil |
| Mean | | Syst. 150<br>Diast. 96.6 | | | 146333.33 | 1.71 | 72.3 | 210.8 | |
| SD ± | | Syst. 0<br>Diast. 30.98 | | | 568.37 | 0.04 | 64.5 | 92.22 | |

Table 6 shows the clinical characteristics and laboratory findings of the 24 patients with thrombocytopenia that were found in the severe PIH group. Symptoms and signs were frequent and were found in 18 patients 80%). The systolic blood pressure ranged from 160 - 210 mm Hg and the diastolic from 110 - 150 mm Hg., Oedema ranged from (++) to (+++) and albuminuria ranged from (+++) to (++++). Lowest platelet count was 90,000. Serum creatinine, SGOT, and LDH were elevated in all cases and there was evidence of haemolysis in 4 cases (13.3%).

**Table 6a shows the clinical characteristics and laboratory findings in the 11 cases with thrombocytopenia (platelet count from 100,000 to 150,000/cu mm) in severe PIH group.**

| Case No. | Complaints | BL.P (mm Hg) | Oed-ema | Album-inuria | Platelet count (/cu mm) | S.Creat-inine. (mg%) | SGOT (U/L) | LDH (U/L) | Haemo lysis |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Headache, nausea and vomiting | 160/100 | +++ | +++ | 137,000 | 1.9 | 57 | 270 | No |
| 2 | Headache | 180/120 | +++ | +++ | 112,000 | 1.9 | 41 | 370 | No |
| 3 | Headache, visual disturbances and Jaundice | 210/120 | +++ | +++ | 150,000 | 1.9 | 141 | 460 | Yes |
| 4 | Headache, Epigastric pain, nausea and vomiting | 160/110 | +++ | +++ | 137,000 | 1.7 | 63 | 360 | No |
| 5 | Headache, Epigastric pain, and visual disturbances | 160/110 | +++ | +++ | 137,000 | 1.6 | 73 | 330 | No |
| 6 | Headache, epigastric pain, and visual disturbances | 200/140 | +++ | +++ | 125,000 | 1.7 | 41 | 350 | No |
| 7 | Headache, epigastric pain, and visual disturbances | 180/140 | +++ | +++ | 119,000 | 1.4 | 57 | 178 | No |
| 8 | No complaints | 160/110 | ++ | +++ | 137,000 | 1.2 | 27 | 380 | No |
| 9 | No complaints | 160/110 | +++ | +++ | 112,000 | 1.2 | 137 | 187 | No |
| 10 | Headache, and epigastric pain | 200/120 | ++ | +++ | 122,000 | 2.0 | 41 | 390 | No |
| 11 | Headache, and epigastric pain | 160/110 | +++ | +++ | 137,000 | 1.8 | 41 | 338 | No |
| Mean | | Syst. 175.45<br>Diast. 117.27 | | | 130045 | 1.66 | 65.3 | 328.45 | |
| S D ± | | Syst. 19.67<br>Diast. 12.72 | | | 12250.4 | 0.28 | 38.6 | 85.49 | |

Table 6b shows the clinical characteristics and laboratory findings in the 13 cases with severe thrombocytopenia (Platelet count less than 100,000/cu mm) in severe PIH group.

| Case No. | Complaints | BL.P (mm Hg) | Oed-ema | Album-in | Platelet count (/cu mm) | S.Creat-inine. (mg%) | SGOT (U/L) | LDH (U/L) | Haemo lysis |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Headache, epigastric pain, visual disturbances and Jaundice | 200/120 | +++ | +++ | 90,000 | 1.9 | 63 | 442 | Yes |
| 2 | Epigastric pain, tender liver and jaundice | 160/110 | +++ | +++ | 100,000 | 1.2 | 103 | 478 | Yes |
| 3 | No complaints | 160/120 | +++ | +++ | 100,000 | 1.8 | 73 | 388 | No |
| 4 | Jaundice,tender liver | 180/110 | +++ | +++ | 95,000 | 1.8 | 33 | 560 | Yes |
| 5 | Headache,epigastric pain, and vomiting | 180/140 | ++++ | +++ | 100,000 | 1.8 | 34 | 353 | No |
| 6 | Headache, epigastric pain and visual disturbances | 180/130 | +++ | +++ | 100,000 | 1.8 | 33 | 360 | No |
| 7 | Headache, and epigastric pain | 200/130 | +++ | +++ | 90,000 | 1.9 | 101 | 491 | No |
| 8 | Headache, epigastric pain and vomiting | 180/120 | +++ | +++ | 90,000 | 1.8 | 33 | 590 | No |
| 9 | No complaints | 160/110 | ++ | +++ | 100,000 | 1.9 | 50 | 430 | No |
| 10 | Headache, epigastric pain and vomiting | 180/110 | +++ | +++ | 95,000 | 1.9 | 69 | 470 | No |
| 11 | Headache, and epigastric pain | 170/120 | +++ | +++ | 90,000 | 1.3 | 27 | 438 | No |
| 12 | No complaints | 160/110 | ++ | +++ | 100,000 | 1.1 | 103 | 310 | No |
| 13 | No complaints | 190/150 | +++ | +++ | 100,000 | 1.3 | 47 | 410 | No |
| Mean | Syst. 176.9 / Diast. 122.3 | | | | 88461.538 | 1.42 | 59.15 | 440 | |
| S D ± | Syst. 14.366 / Diast. 12.3 | | | | 4634.043 | 0.304 | 28.649 | 79.8 | |

Table 7 shows the incidence of thrombocytopenia in relation to age, gestational age and systolic and diastolic blood pressure. This table shows that in both mild and severe PIH, there was no statistically significant difference in the number of patients with thrombocytopenia in the age group 19-25 and 25-52 years, nor in those with a gestational age of 30-36 and 36 to 42 weeks (P: N.S). On the other hand, the number of cases with thrombocytopenia increased significantly with increased levels of systolic B.P. in both mild PIH ($P < 0.001$), severe PIH ($P < 0.05$) and diastolic B.P. in severe PIH ($P < 0.05$).

**Table 7 incidence of thrombocytopenia in relation to age, gestational age, systolic and diastolic blood pressure.**

| Parameter | Mild PIH (n=30) | | | Severe PIH (n=30) | | |
|---|---|---|---|---|---|---|
| | No. cases | Thrombocyt | P | No. cases | Thrombocyt | P |
| **Age (years)** | | | | | | |
| 19-25 | 19 | 3 (16%) | N.S | 20 | 14 (70%) | N.S |
| 25-32 | 11 | 3 (27%) | | 10 | 10 (100%) | |
| **Gest. age (Weeks)** | | | | | | |
| 30-36 | 23 | 4 (17%) | N.S | 21 | 15 (71%) | N.S |
| 36-42 | 7 | 2 (28%) | | 9 | 9 (100%) | |
| **Systolic B.P. (mm Hg)** | | | | | | |
| 140-145 | 14 | 0 (00.0%) | P <0.001 | -- | -- | |
| 145-150 | 16 | 6 (73.5%) | | -- | -- | |
| 160-185 | - | -- | | 25 | 19 (76%) | <0.05 |
| 185-210 | - | -- | | 5 | 5 (100%) | |
| **Diastolic B.P. (mm Hg)** | | | | | | |
| 90-95 | 13 | 2 (15%) | N.S | -- | -- | |
| 95-100 | 17 | 4 (23.5%) | | -- | -- | |
| 110-130 | -- | | | 26 | 20 (77%) | <0.05 |
| 130-150 | -- | | | 4 | 4 (100%) | |

Table 8 shows the incidence of thrombocytopenia in relation to oedema,albuminuria and symptoms of severe PIH. This table shows that the incidence of thrombocytopenia increased significantly with the severity of albuminuria, Morever, it increased only in cases with symptoms of severe PIH.

**Table 8:Thrombocytopenia in relation to oedema, albuminuria and symptoms of severe PIH.**

| Parameter | Mild PIH | | | Severe PIH | | |
|---|---|---|---|---|---|---|
| | No. cases | Thrombocyt. | P | No. cases | Thrombocyt. | P |
| **Oedema** | | | | | | |
| Nil | 9 | 0 | | | | |
| + | 8 | 1 (12.5%) | N.S | | | |
| ++ | 13 | 5 (31.0%) | | 7 | 4 (57.1%) | N.S |
| +++ | 0 | 0 | | 23 | 20 (86.9%) | |
| **Albuminuria** | | | | | | |
| + | 10 | 0 (0.0%) | N.S | | | |
| ++ | 20 | 6 (30%) | | | | |
| +++ | 0 | 0 | | 18 | 12 (66%) | <0.05 |
| ++++ | 0 | 0 | | 12 | 12 (100%) | |
| **Symptoms** | | | | | | |
| Epigastric pain | - | - | | 12 | 7 (87.5%) | |
| Headache | - | - | | 18 | 11 (61%) | |
| Visual disturbances | - | - | | 5 | 5 (100%) | |
| Vomiting | - | - | | 5 | 3 (60%) | |

Table 9 shows incidence of thrombocytopenia in relation with serum creatinine, SGOT, and LDH. This table shows that the incidence of thrombocytopenia increased as the levels of serum creatinine, SGOT, and serum LDH increased.

**Table 9 : The incidence of thrombocytopenia in relation with serum creatinine, SGOT, and LDH.**

| Laboratory test | Mild PIH (n=30) | | | Severe PIH (n=30) | | |
|---|---|---|---|---|---|---|
| | No. cases | Thrombocy | P | No. cases | Thrombocy | P |
| **Creatinine (mg/dl)** | | | | | | |
| 0.8-1.4 | 20 | 0 (0.0%) | <0.001 | 10 | 7 (70%) | N.S |
| 1.5-2 | 10 | 6 (60%) | | 20 | 17 (85%) | |
| **SGOT (U/L)** | | | | | | |
| 19-49 | 29 | 5 (17%) | <0.05 | -- | | |
| 50-80 | 1 | 1 (100%) | | -- | | |
| 81-110 | -- | -- | | 24 | 18 (75%) | <0.05 |
| 111-141 | -- | -- | | 6 | 6 (100%) | |
| **LDH (U/L)** | | | | | | |
| 113-233 | 28 | 4 (14%) | <0.01 | 2 | 2 (100%) | N.S |
| 234-354 | 2 | 2 (100%) | | 10 | 5 (50%) | |
| 355-475 | -- | -- | | 11 | 10 (91%) | |
| 476-596 | -- | -- | | 7 | 7 (100%) | |

## HELLP SYNDROME

This is a clinical syndrome characterized by : haemolysis (H), elevated liver enzymes (EL) and low platelet count(LP). We found four cases of HELLP syndrome in the group of severe PIH, the clinical and laboratory findings of which are shown in table 10.

Table 10 : clinical and laboratory findings in the 4 cases with HELLP syndrome.

| Criteria | Case 1 | Case 2 | Case 3 | Case 4 |
|---|---|---|---|---|
| Age (years) | 33 | 20 | 21 | 20 |
| Nausea & vomiting | No | No | No | No |
| Visual disturbance | Yes | No | Yes | No |
| Epigastric pain | Yes | Yes | No | No |
| Headache | Yes | No | Yes | Yes |
| Ecchymosis | Yes | Yes | Yes | Yes |
| Platelet count(cu mm) | 90,000 | 100,000 | 150,000 | 95,000 |
| Oedema | +++ | +++ | +++ | +++ |
| Jaundice | Yes | Yes | Yes | Yes |
| Tender liver | No | Yes | No | No |
| Blood pressure | 200/120 | 160/110 | 210/120 | 180/110 |
| Albuminuria | +++ | +++ | +++ | +++ |
| S. Creatinine mg% | 1.9 | 1.2 | 1.9 | 1.8 |
| SGOT U/L | 63 | 103 | 141 | 33 |
| LDH U/L | 442 | 478 | 460 | 560 |

By using the correlation coefficient we found that : In mild cases with PIH, there was no significant correlation between thrombocytopenia and age, gestational age, and SGOT, but there was a significant correlation between thrombocytopenia, and systolic blood prssure, serum creatinine, and LDH. In cases with severe PIH, we found no significant correlation between thrombocytopenia and age, gestational age, systolic blood pressure, serum creatinine and SGOT, while there was a significant correlation between thrombocytopenia and diastolic blood pressure, and LDH (Table 11).

**Table 11 Correlation coefficient between thrombocytopenia, and age, gestational age, systolic blood pressure, diastolic blood pressure, serum creatinine, SGOT, and LDH in mild and severe PIH.**

| PIH | age | Gest.age | Systolic B.P. | Diastolic B.P. | S.Creatinine | SGOT | LDH |
|---|---|---|---|---|---|---|---|
| Mild | r-.278 | r-.089 | r-.464 | r-.079 | r-.573 | r-.273 | r-.377 |
| | N.S | N.S | P<0.01 | N.S | P<0.001 | N.S | P<0.05 |
| Severe | r-.183 | r-.072 | r-.283 | r-.460 | r-.167 | r-.196 | r-.466 |
| | N.S | N.S | N.S | P<0.01 | N.S | N.S | P<0.01 |

By using the correlation coefficient between thrombocytopenia and the clinical findings and laboratory invistigations in the 60 cases with mild and severe PIH. (table 12) , we found no significant correlation between thrombocytopenia and age, and gestational age, but we found a significant correlation between thrombocytopenia and systolic blood pressure, diastolic blood pressure, serum creatinine, SGOT and LDH.

Table 12Correlation coefficient between thrombocytopenia and age, gestational age, systolic and diastolic blood pressure,and serum creatinine, SGOT, and LDH.

| Variable | Age | Gest. age | Syst. B.P | Diast. B.P | Creatinine | SGOT | LDH P.C |
|---|---|---|---|---|---|---|---|
| In both mild and severe PIH. | r-.0349 N.S | r-.099 N.S | r-.710 P<0.001 | r-.699 P<0.001 | r-.593 P<0.001 | r-.273 P.0. 05 | r-.765 P<0.001 |

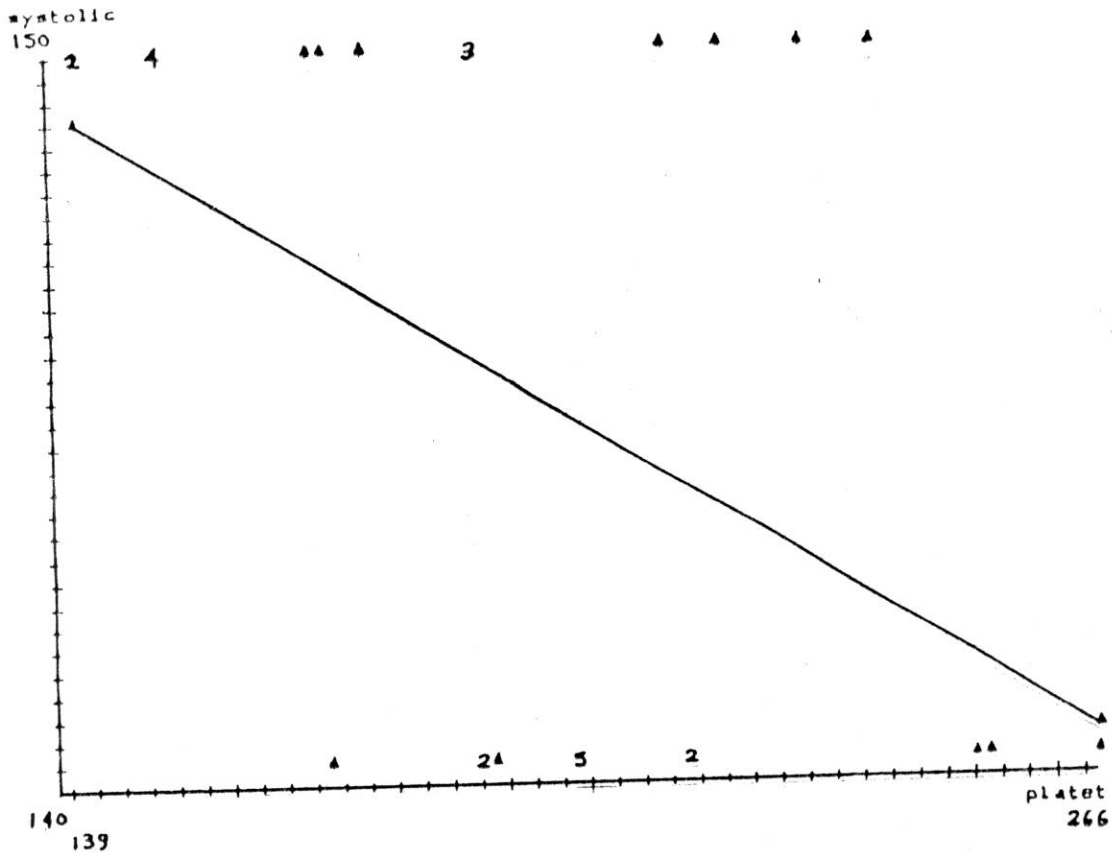


Figure (5): Shows the correlation between platelet count and systolic blood pressure in mild PIH. There was a significant inverse correlation between the level of systolic B.P and platelet count.
$r = -.464$
$P < 0.01$

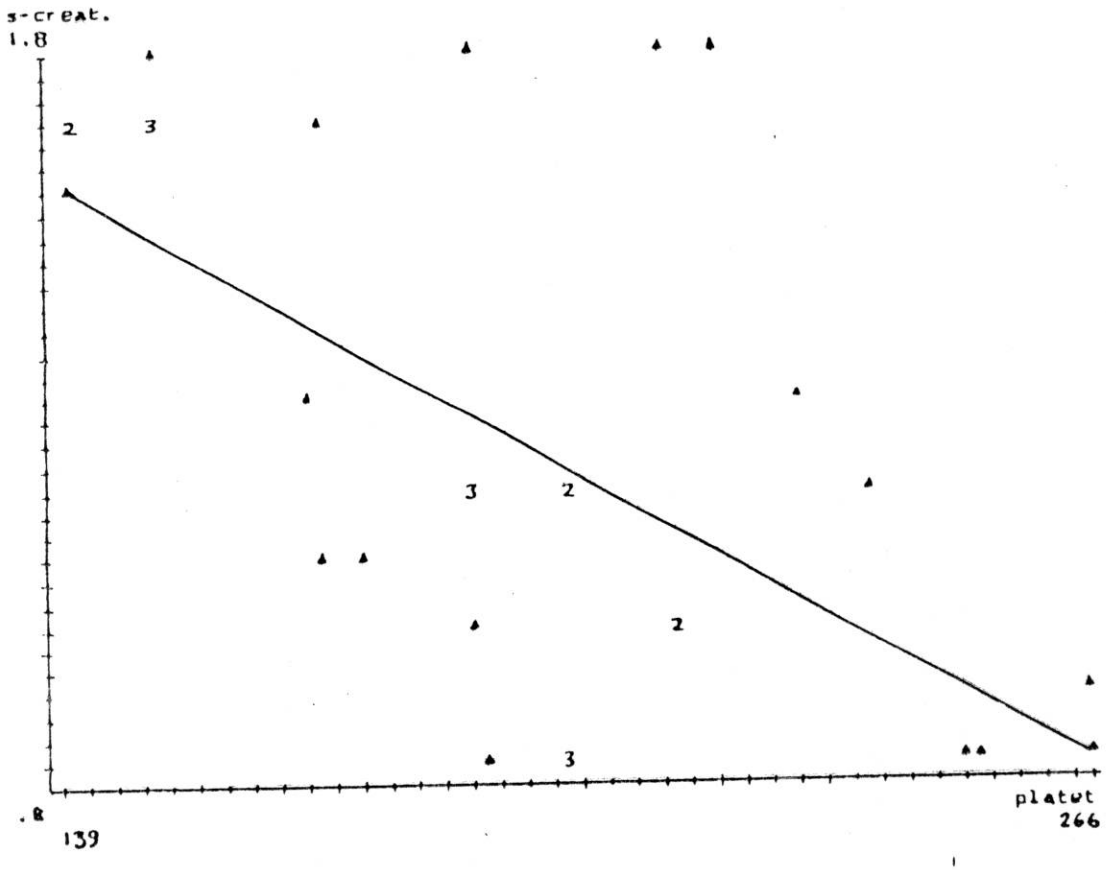


Figure (6): Shows the correlation between platelet count and serum creatinine in mild PIH. There was a significant, inverse correlation between level of serum creatinine and platelet count.
$r = -.583$
$P < 0.001$

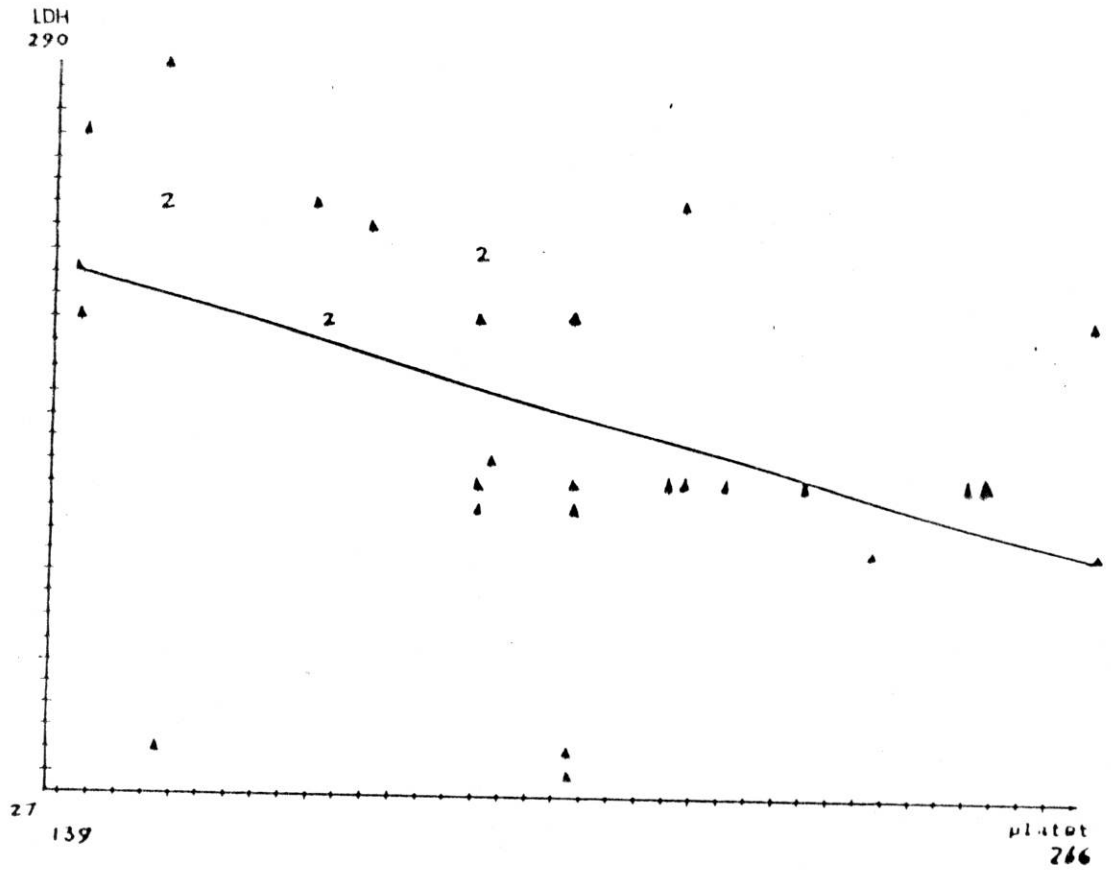


Figure (7): Shows the correlation between platelets count and LDH in mild PIH. There was a significant, inverse correlation between the level of LDH and platelet count.
r = -.377
P < 0.05

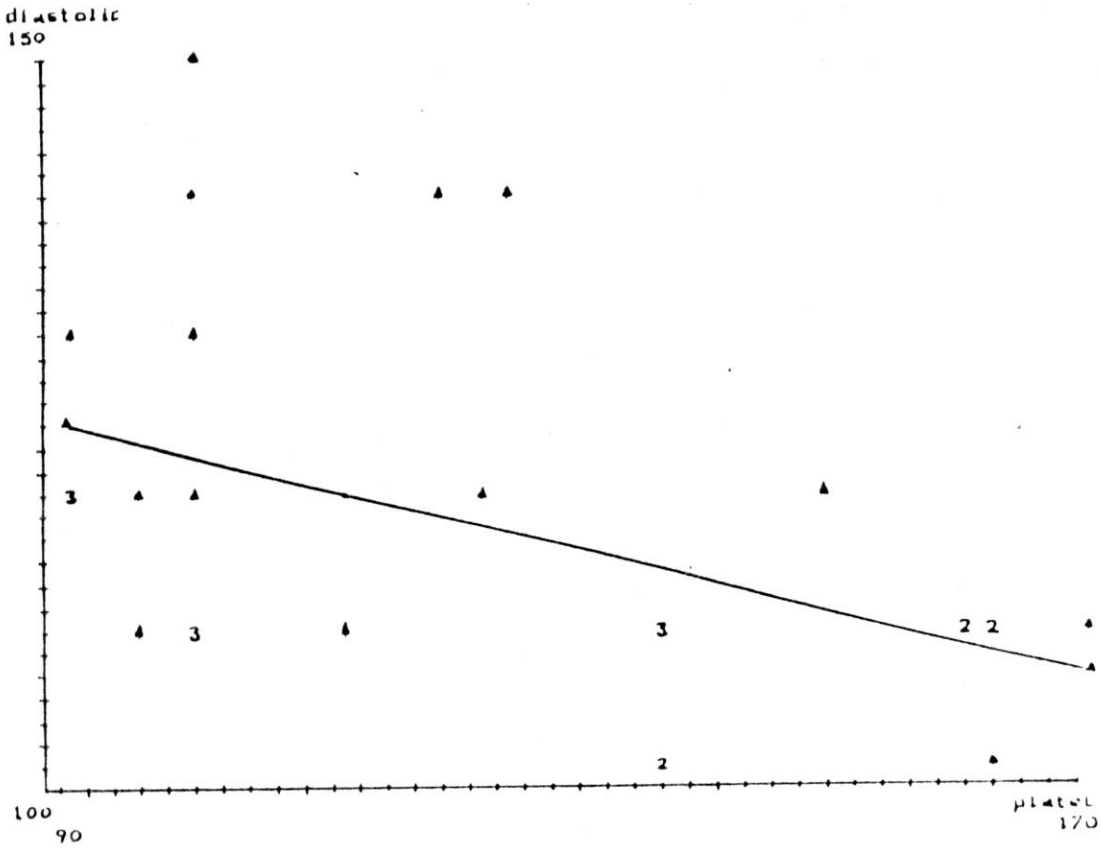


Figure (8): Shows the correlation between platelet count and diastolic blood pressure. There was significant, inverse correlation between level of diastolic blood pressure and platelet count.
r = -.460
P < 0.01

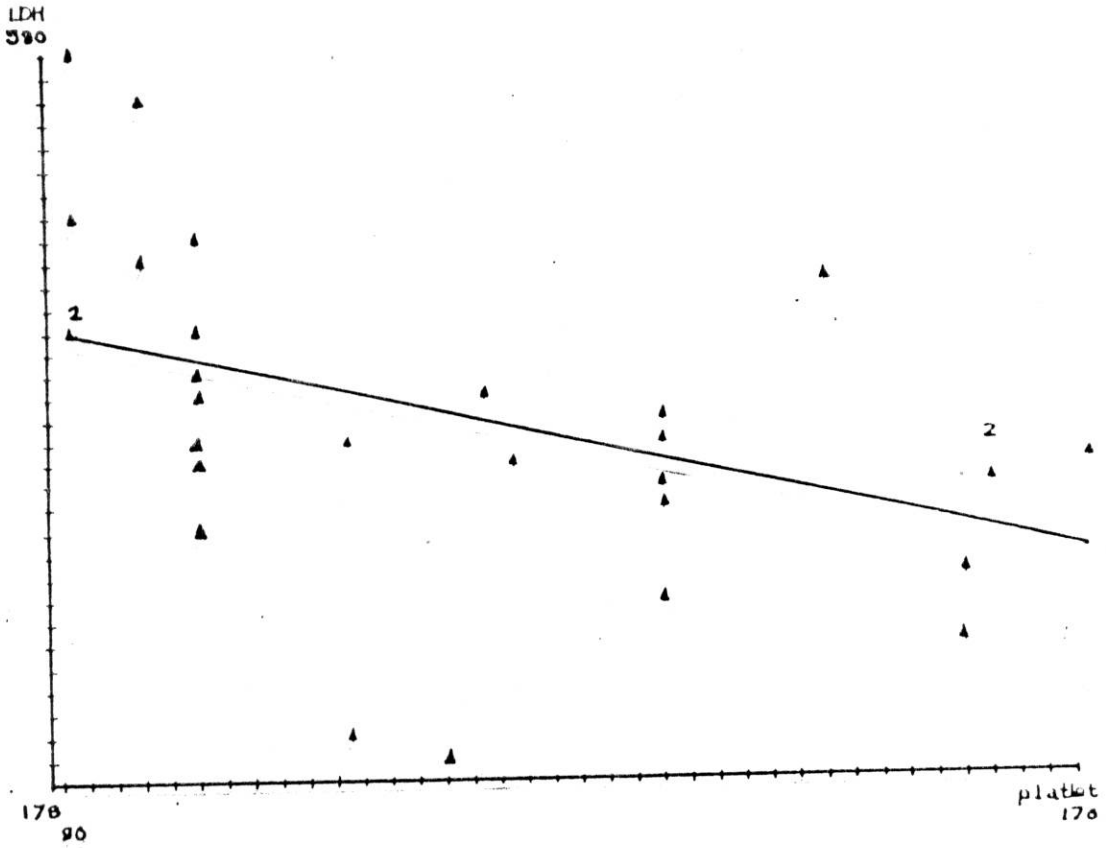


Figure (9): Shows the correlation between platelet count and serum LDH in severe PIH. There was significant, inverse correlation between level of LDH and platelet count.
$r = -.710$
$P < 0.001$

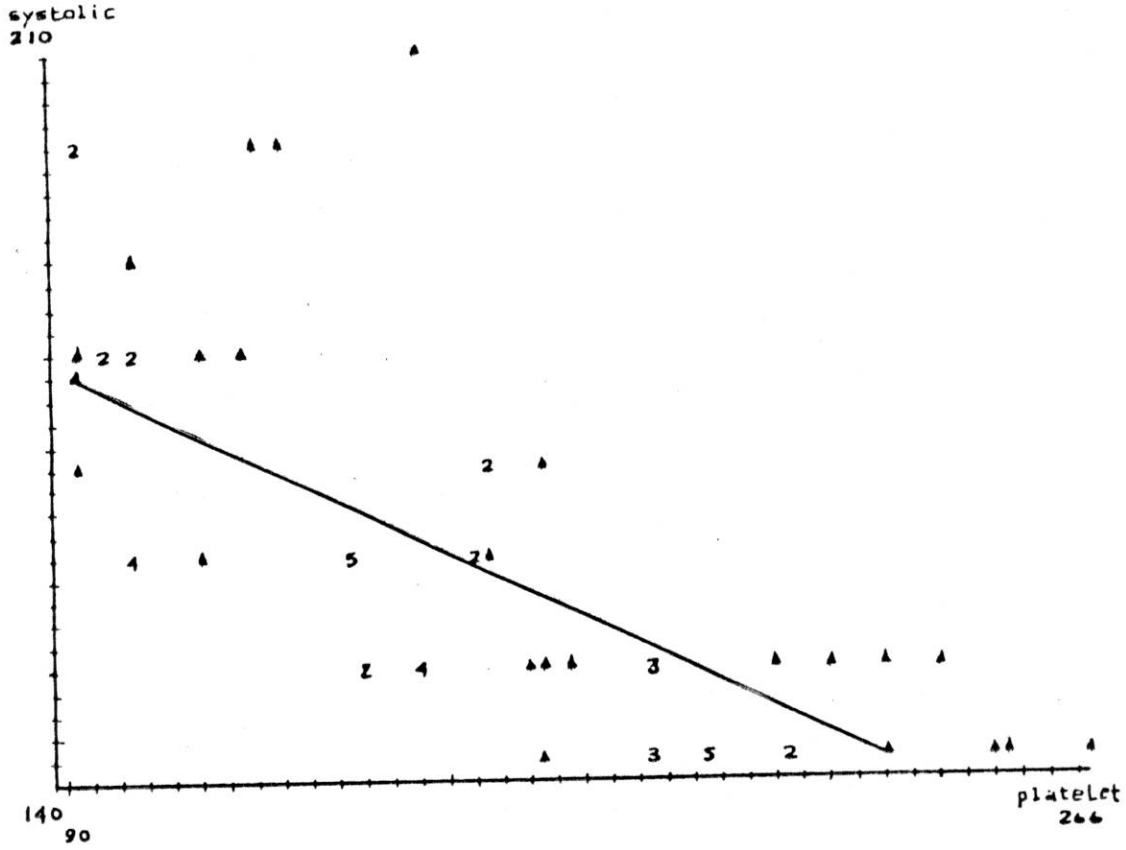


Figure (10): Shows the correlation between platelet count and systolic blood pressure in the 60 cases of both mild and severe PIH. There was significant, inverse correlation between systolic Bl.p and platelet count.

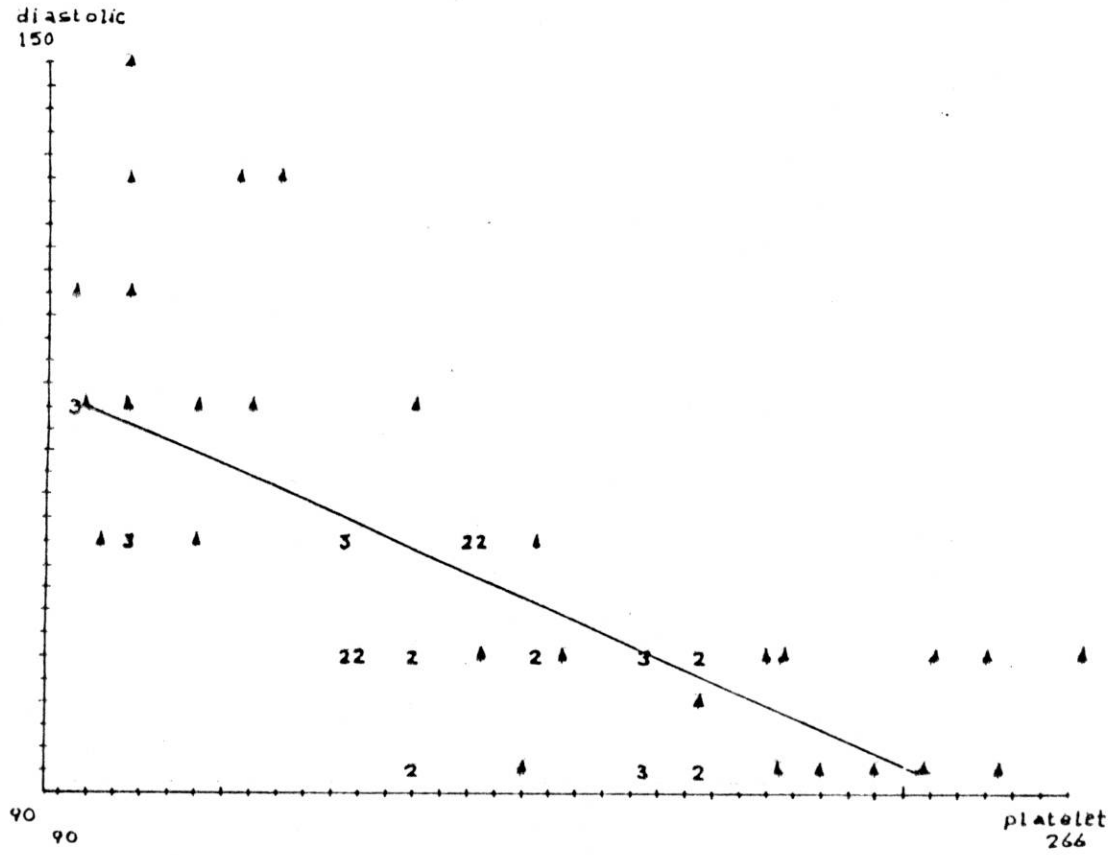


Figure (11): Shows the correlation between platelet count and diastolic blood pressure in the 60 cases of both mild and severe PIH. There was significant, inverse correlation between diastolic Bl.P. and platelet count.
r = -.699
P < 0.001

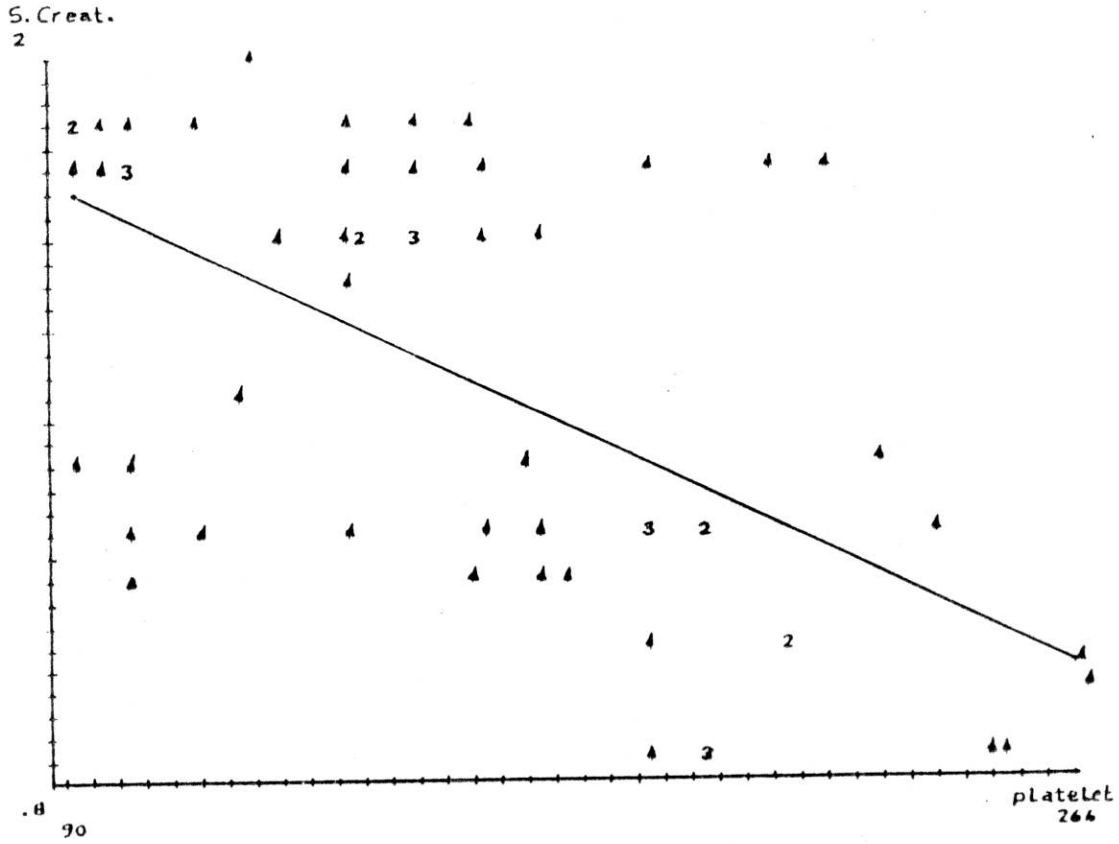


Figure (12): Shows the correlation between platelet count and serum creatinine in the 60 cases of both mild and severe PIH. There was a significant, inverse correlation between serum creatinine and platelet count.
r = -.593
P < 0.001

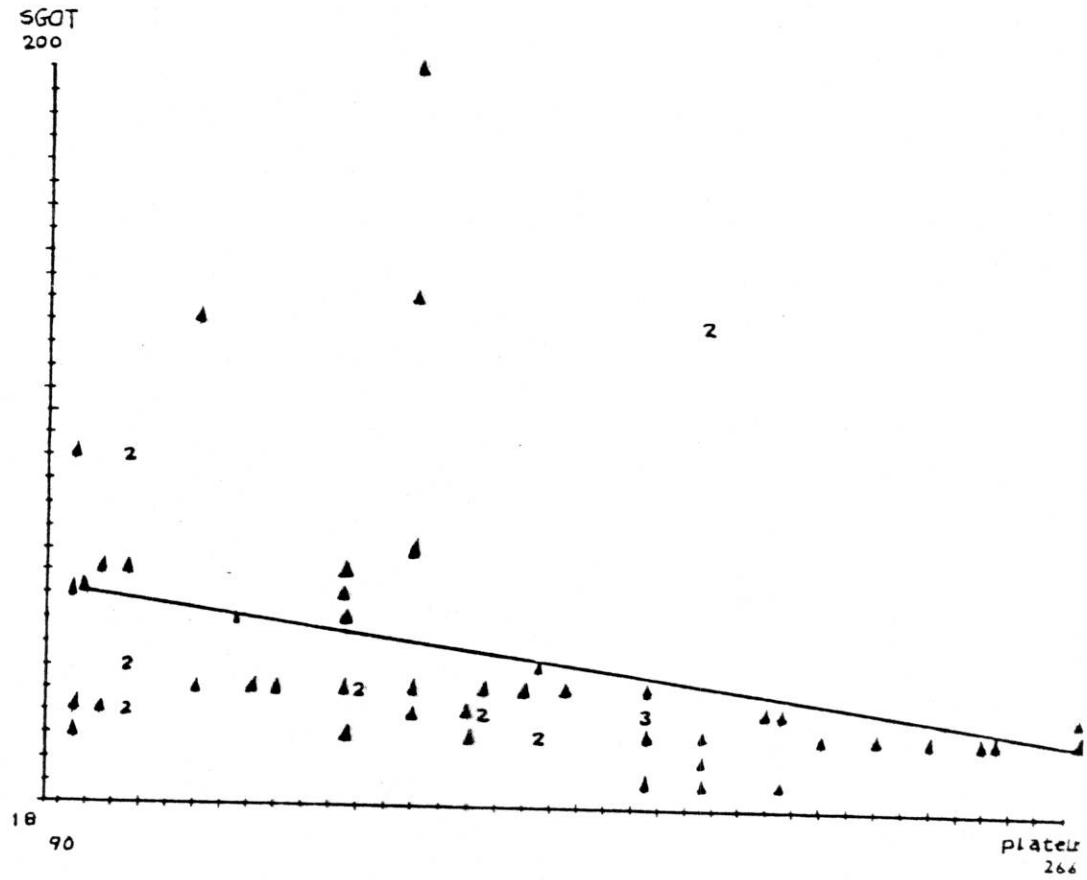


Figure (13): Shows the correlation between platelet count and serum SGOT in the 60 cases of both mild and severe PIH. There was a significant, inverse correlation between serum SGOT and platelet count.
$r = -.273$
$P < 0.05$

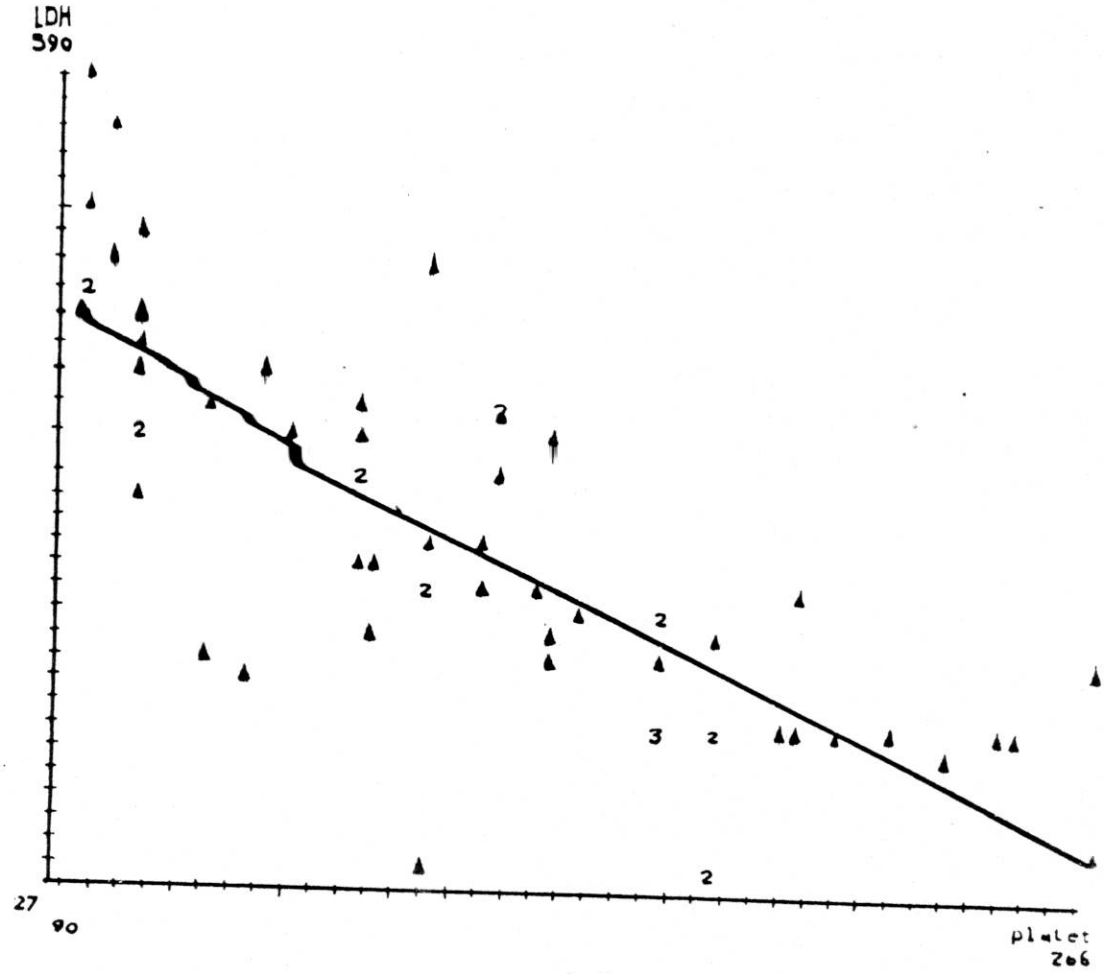


Figure (14): Shows the correlation between platelet count and serum LDH in the 60 cases of both mild and severe PIH. There was a significant, inverse correlation between serum LDH and platelet count.
$r = -.765$
$P < 0.001$