# RESULTS

Forty patients suffering from knee O.A. were included in this study. Their age was ranged between 45-64 years; with a mean age of 53.6±6.1 years. They were 11 males (27.5%) and 29 females (72.5%) with a male to female ratio of 1:3.7.

Multidimensional assessment using knee pain scale (KPS), WOMAC scale and measurement of morning serum cortisol levels and also CT scanning were done at baseline and at end of treatment course (8 weeks).

Table (2): shows patients characteristics and clinical variables in patients with knee O.A.

Table (3) and Fig. (1): show radiographic grading of O.A. patients in the acupuncture group.

Table (4) and Fig. (2): show radiographic grading of O.A. patients in control group.

Table (5) and Fig. (3): shows the insignificant difference ($P>0.05$) from baseline to end of treatment in the control group as regards to mean KPS and its subscales, which include

- Transfer frequency subscale (TFS).
- Ambulation/climbing frequency subscale (AFS).
- Transfer intensity subscale (TIS).
- Ambulation/climbing intensity subscale (ATS).

Table (6) and Fig. (4): show the significant difference ($P<0.05$) from baseline to end of treatment in the acupuncture group as regards to KPS and its subscales, which include

- Transfer frequency subscale (TFS).
- Ambulation/climbing frequency subscale (AFS).
- Transfer intensity subscale (TIS).
- Ambulation/climbing intensity subscale (ATS).

Table (7) and Fig. (5): show the statistical comparison between both study groups, as regards KPS, at end of treatment. This illustrates the significant difference ($P<0.05$) at end of treatment in the acupuncture group.

Table (8) and Fig. (6): show insignificant difference ($P>0.05$) from baseline to end of treatment in the control group as regards to WOMAC scale and its subscales, which include

- WOMAC pain subscale.
- WOMAC stiffness subscale.
- WOMAC disability subscale.

Table (9) and Fig. (7): show significant difference ($P<0.05$) from baseline to end of treatment in the acupuncture group as regards to WOMAC scale and its subscales, which include

- WOMAC pain subscale.
- WOMAC stiffness subscale.
- WOMAC disability subscale.

Table (10) and Fig. (8): shows the statistical comparison between both study groups, as regards WOMAC score, at end of treatment. This illustrates the significant difference ($P<0.05$) at end of treatment in the acupuncture group.

Table (11) and Fig. (9): shows the mean serum cortisol at baseline and at end of treatment in control group.

Table (12) and Fig. (10): shows the mean serum cortisol at baseline and at end of treatment in acupuncture group.

Table (13) and Fig. (11): shows the statistical comparison between both study groups, as regards mean serum cortisol levels, at end of treatment. This illustrates the significant difference ($P<0.05$) at end of treatment in the acupuncture.

Table (14) and Fig. (12 [a-b]) shows correlation coefficient (r) between morning serum cortisol before and after each line of treatment. There was a positive significant correlation between morning serum cortisol levels and the application of acupuncture therapy, ($r=0.632$, $P<0.05$). On the other hand, there was a positive non-significant correlation between morning serum cortisol levels and the use of conventional therapy, ($r=0.469$, $P>0.05$).

Table (15) and (Fig. 13 [a-d]) show correlation coefficient (r) between morning serum cortisol and KPS and its subscales. There was a negative significant correlation between morning serum cortisol levels and the mean transfer frequency subscale, ($r=-0.491$, $P<0.05$). Mean ambulation /climbing frequency subscale, also

showed a negative significant correlation with morning serum cortisol level, ($r=-0.431$, $P<0.05$). Similarly, mean transfer intensity subscale showed a negative significant correlation with morning serum cortisol level, ($r=-0.443$, $P<0.05$). Also, mean ambulation/climbing intensity subscale showed a negative significant correlation with morning serum cortisol levels, ($r=-0.413$, $P<0.05$).

Table (16) and (Fig. 14 [a-d]) shows correlation coefficient (r) between morning serum cortisol levels and WOMAC scale and subscales. There was a negative significant correlation between morning serum cortisol levels and the WOMAC pain subscale, ($r=-0.452$, $P<0.05$), WOMAC stiffness subscale, ($r=-0.720$ $P<0.05$) and also, WOMAC disability subscale showed a negative significant correlation with morning serum cortisol level, ($r=-0.591$, $P<0.05$).

Pre- and post-treatment scanning carried out on 5 cases of each group and revealed no considerable changes CT pictures of the knee joint, except for the amount of knee effusion, which showed a marked reduction in acupuncture group, (Fig. 15 & 16).

**Table (2): Patients characteristics presented as mean±SD**

| | Control group (n=10) (mean±SD) | Acupuncture group (n= 30) (mean±SD) | P value |
|---|---|---|---|
| **Age (Ys)** | 53.6±6.1 | 53.7±6.65 | >0.05 |
| **Disease duration (Ys)** | 8.1±3.2 | 9±3.3 | >0.05 |
| **Knee Pain Scale (KPS)** | | | |
| • Transfer frequency subscale | 4.7 | 4.72 | >0.05 |
| • Ambulation/ climbing frequency subscale | 4.73 | 4.52 | >0.05 |
| • Transfer intensity subscale | 4.83 | 4.89 | >0.05 |
| • Ambulation/ climbing intensity subscale | 5.23 | 5.26 | >0.05 |
| **WOMAC Scale** | | | |
| • WOMAC pain subscale | 15.7 | 15.3 | >0.05 |
| • WOMAC stiffness subscale | 6.3 | 6.5 | >0.05 |
| • WOMAC disability subscale | 52.5 | 53.5 | >0.05 |
| **S. Cortisol level (µg%)** | 11.8±1.13 | 12.6±1.69 | >0.05 |

**Table (3): Radiographic grading of knee OA of the control group**

| Side / Grade | Rt. knee | Lt. knee |
|---|---|---|
| Grade 0 | 2 (20%) | 3 (30%) |
| Grade I | 1(1%) | 2 (20%) |
| Grade II | 5 (50%) | 3 (30%) |
| Grade III | 2 (20%) | 2 (20%) |
| Grade IV | - | - |

**Table (4): Radiographic grading of knee OA of the acupuncture group**

| Side / Grade | Rt. knee | Lt. knee |
|---|---|---|
| Grade 0 | 6 (20%) | 7 (23.4%) |
| Grade I | 3 (10%) | 10 (33.3%) |
| Grade II | 12 (40%) | 9 (30%) |
| Grade III | 7 (23.3%) | 3 (10%) |
| Grade IV | 2 (6.7%) | 1 (3.3%) |

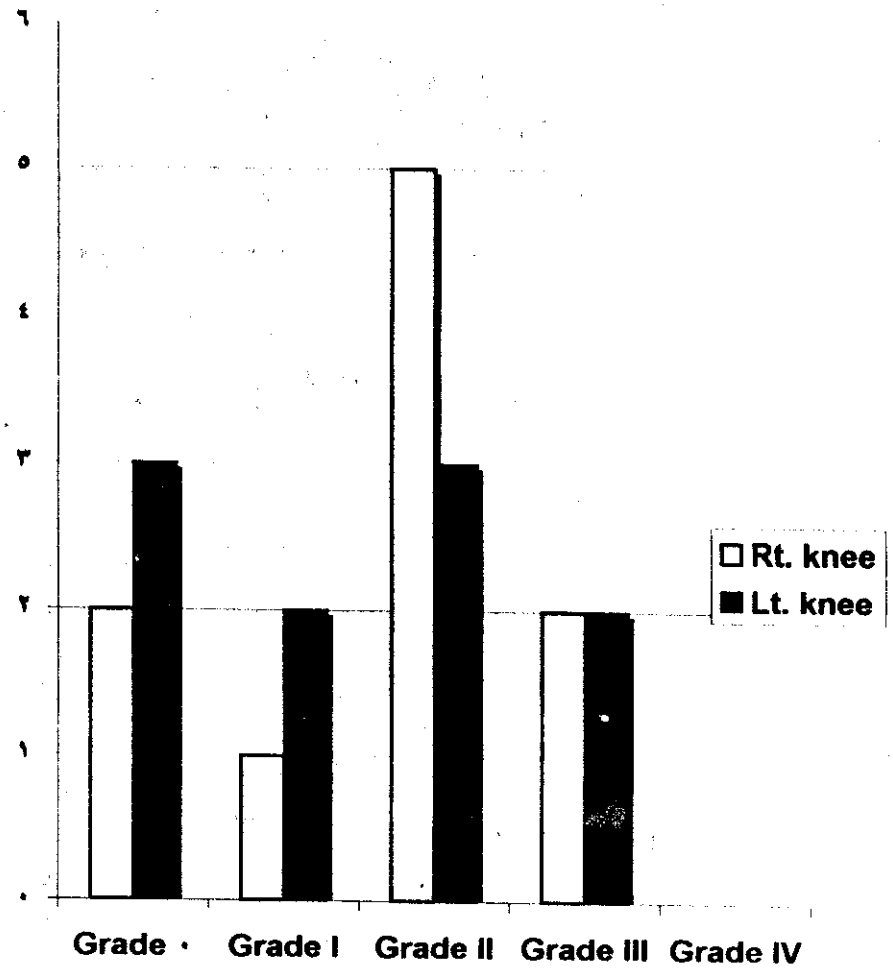


**Fig.(1): Radiological grading of knee OA of control group**

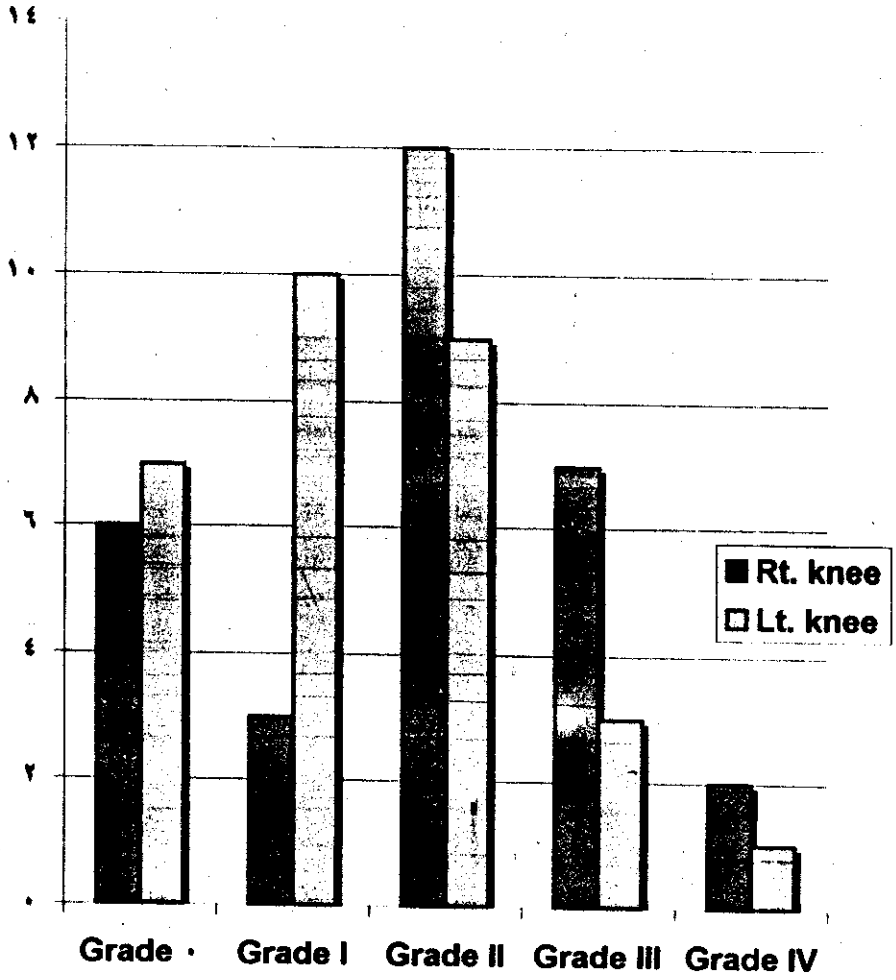


**Fig. (٢): Radiographic grading of knee OA of acupuncture group**

**Table (5): KPS evaluation in the control group**

| Knee pain scale | Baseline (mean±SD) | End of treatment (mean±SD) | P value |
|---|---|---|---|
| Transfer frequency subscale | 4.70±1.07 | 4.40±0.76 | >0.05 |
| Ambulation/climbing frequency subscale | 4.73±0.81 | 4.45±0.63 | >0.05 |
| Transfer intensity subscale | 4.83±1.19 | 4.26±0.72 | >0.05 |
| Ambulation/climbing intensity subscale | 5.23±1.03 | 4.46±0.56 | >0.05 |

**Table (6): KPS evaluation in the acupuncture group**

| Knee pain scale | Baseline (mean±SD) | End of treatment (mean±SD) | P value |
|---|---|---|---|
| Transfer frequency subscale | 4.72±1.04 | 1.98±0.26 | <0.05 |
| Ambulation/climbing frequency subscale | 4.52±0.65 | 2.04±0.3 | <0.05 |
| Transfer intensity subscale | 4.89±1.23 | 1.99±0.23 | <0.05 |
| Ambulation/climbing intensity subscale | 5.26±1.01 | 2.85±0.17 | <0.05 |

**Table (7): KPS at end of treatment in both studied groups**

| Knee pain scale | Control (mean±SD) | Acupuncture (mean±SD) | P value |
|---|---|---|---|
| Transfer frequency subscale | 4.40±0.76 | 1.98±0.26 | <0.05 |
| Ambulation/climbing frequency subscale | 4.45±0.63 | 2.04±0.3 | <0.05 |
| Transfer intensity subscale | 4.26±0.72 | 1.99±0.23 | <0.05 |
| Ambulation/climbing intensity subscale | 4.46±0.56 | 2.85±0.17 | <0.05 |

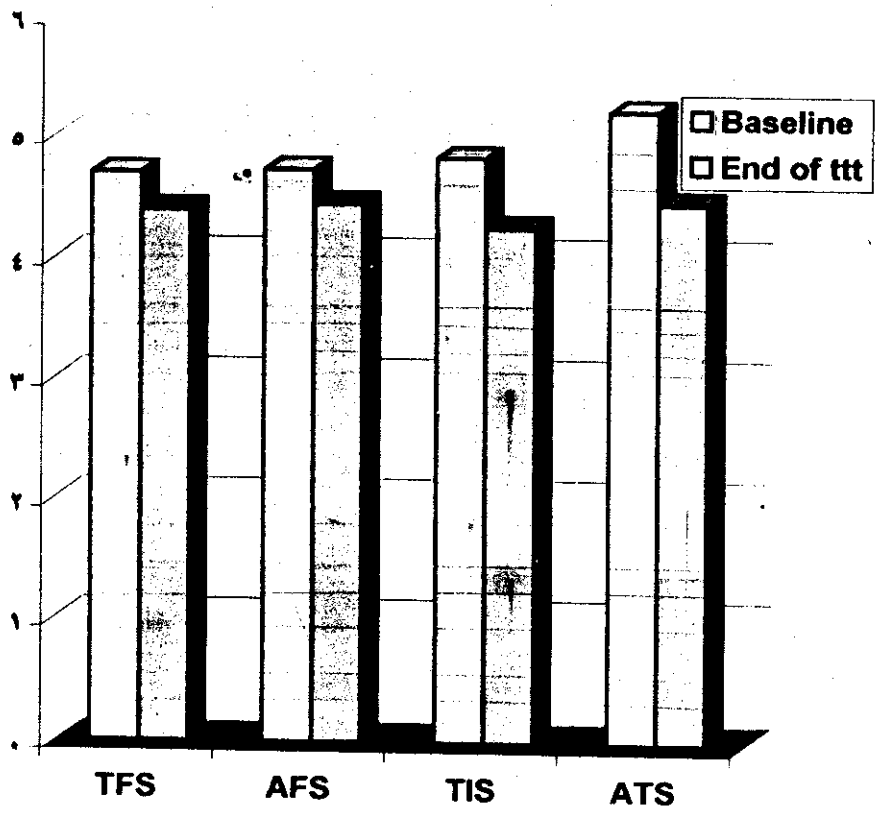


Fig. (٩): KPS evaluation of the control group

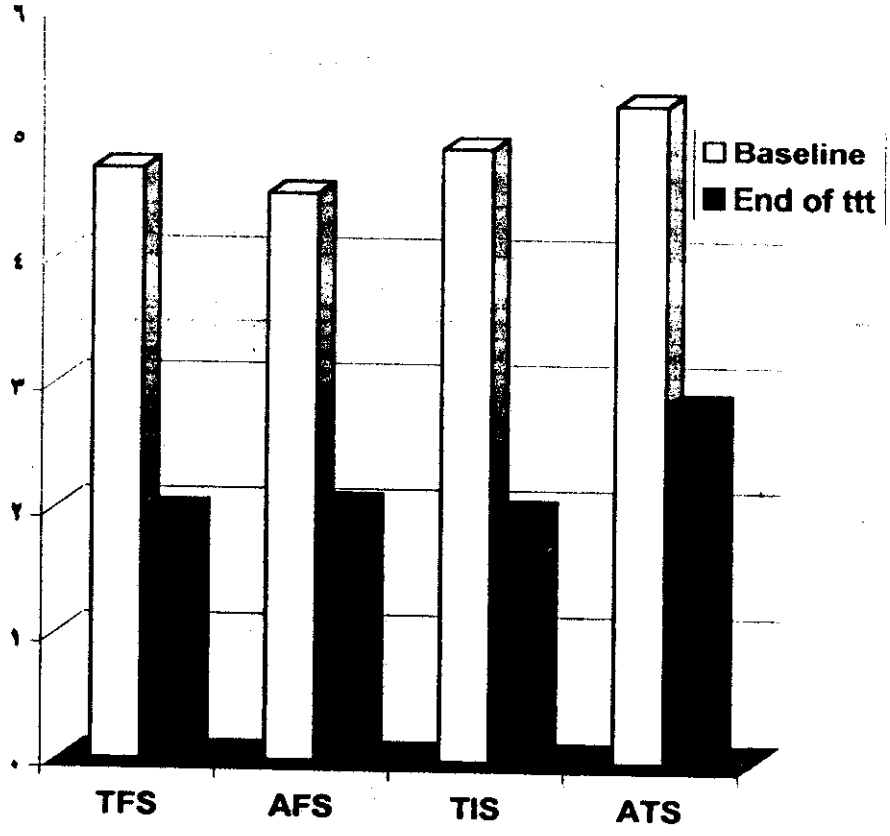


**Fig. (٩): KPS evaluation of acupuncture group**

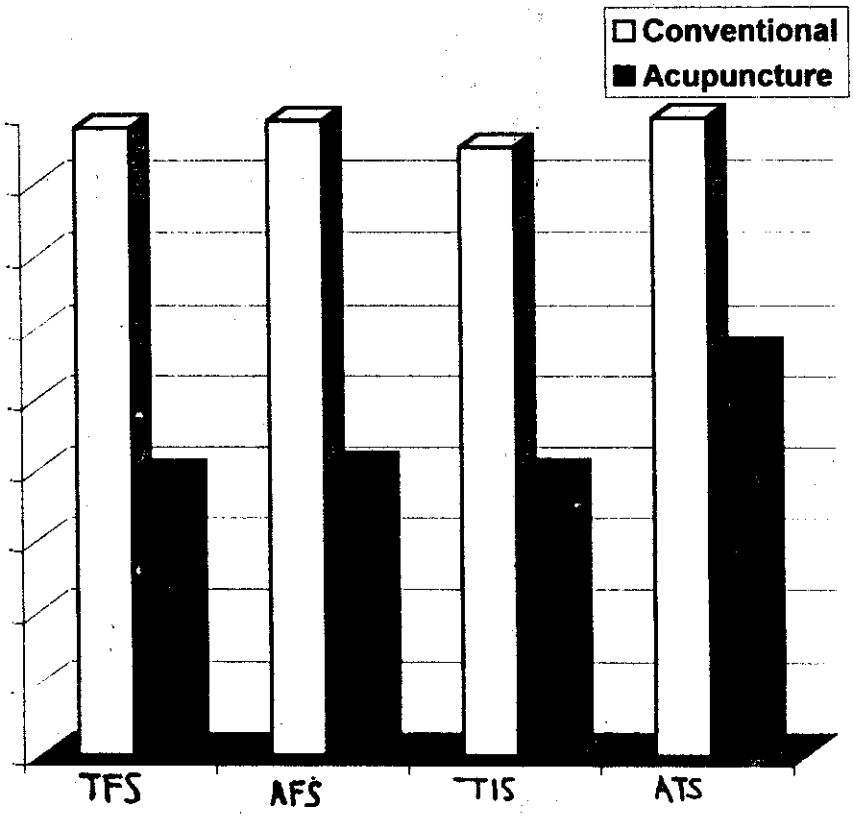


**Fig. (5): KPS evaluation at end of treatment in control and acupuncture groups**

**Table (8): WOMAC scale evaluation of control group**

| WOMAC scale | Baseline (mean±SD) | End of treatment (mean±SD) | P value |
|---|---|---|---|
| WOMAC pain subscale | 15.7±1.76 | 15.4±1.85 | <0.05 |
| WOMAC stiffness subscale | 6.4±1.83 | 6.1±2.02 | <0.05 |
| WOMAC disability subscale | 52.5±12.8 | 52.2±12.1 | <0.05 |

**Table (9): WOMAC scale evaluation acupuncture group**

| WOMAC scale | Baseline (mean±SD) | End of treatment (mean±SD) | P value |
|---|---|---|---|
| WOMAC pain subscale | 15.3±1.65 | 5.6±0.93 | <0.05 |
| WOMAC stiffness subscale | 6.5±1.72 | 2.8±0.66 | <0.05 |
| WOMAC disability subscale | 53.5±13.9 | 22.06±1.73 | <0.05 |

**Table (10): WOMAC scale at end of treatment in both studied groups**

| WOMAC scale | Control (mean±SD) | Acupuncture (mean±SD) | P value |
|---|---|---|---|
| WOMAC pain subscale | 15.4±1.85 | 5.6±0.93 | <0.05 |
| WOMAC stiffness subscale | 6.1±2.02 | 2.8±0.66 | <0.05 |
| WOMAC disability subscale | 52.2±12.1 | 22.06±1.73 | <0.05 |

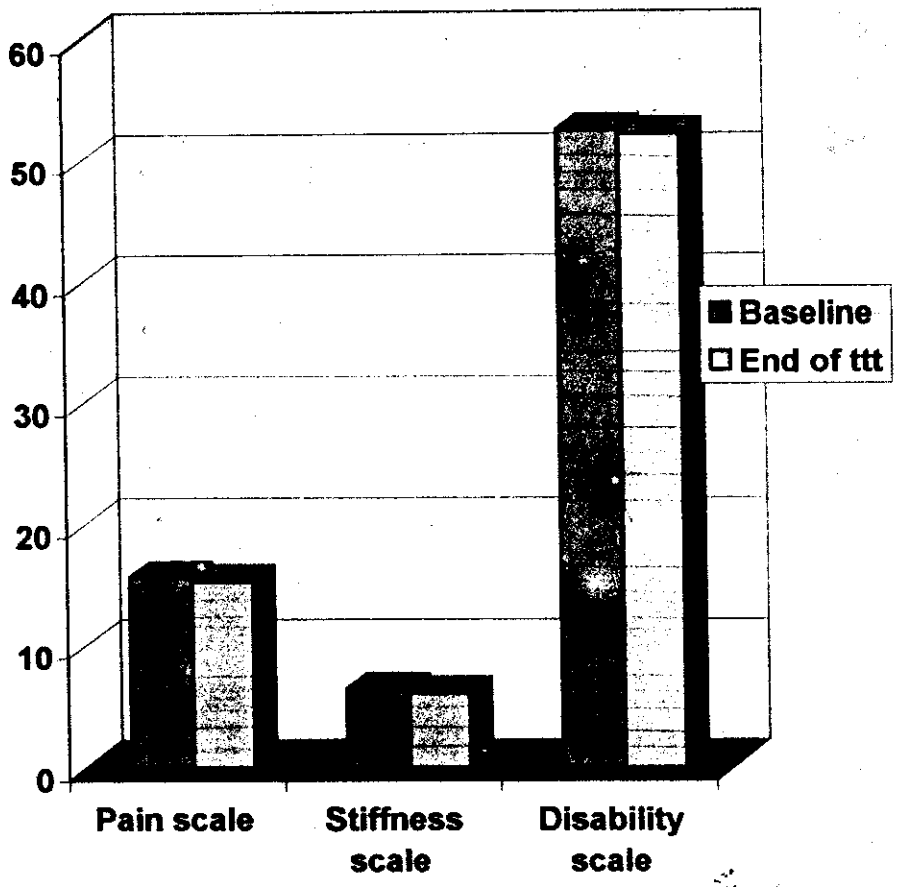


**Fig. (6): Womac scale evaluation of control group**

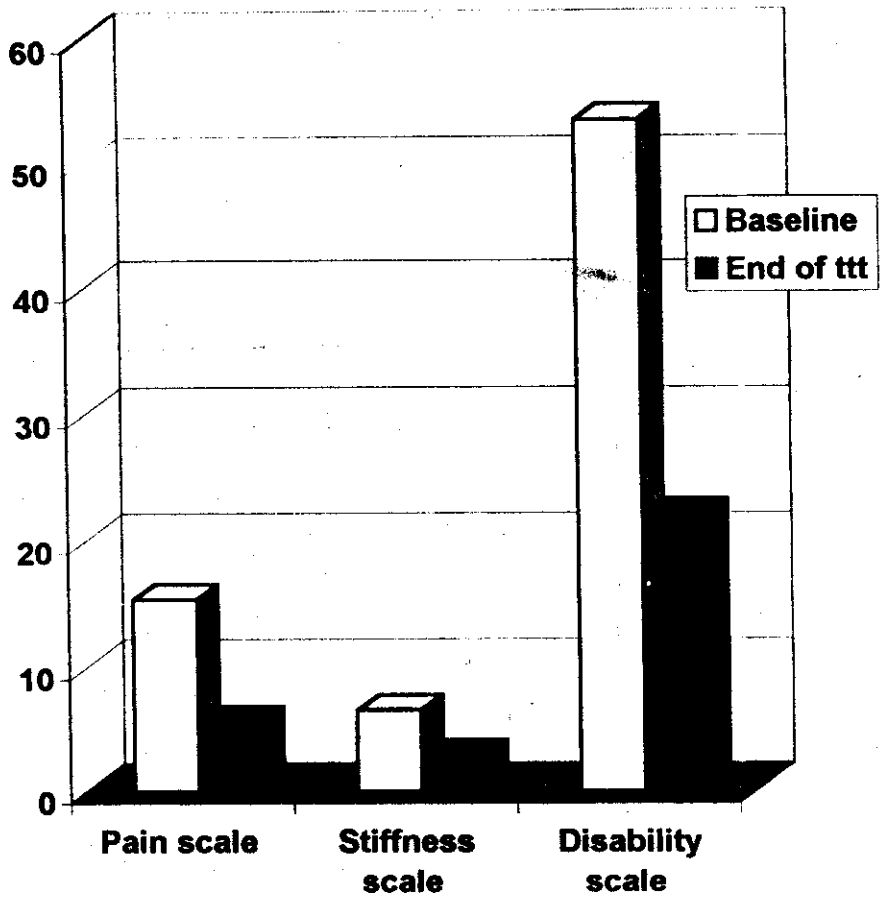


**Fig. (7): Womac scale evaluation of acupuncture group**

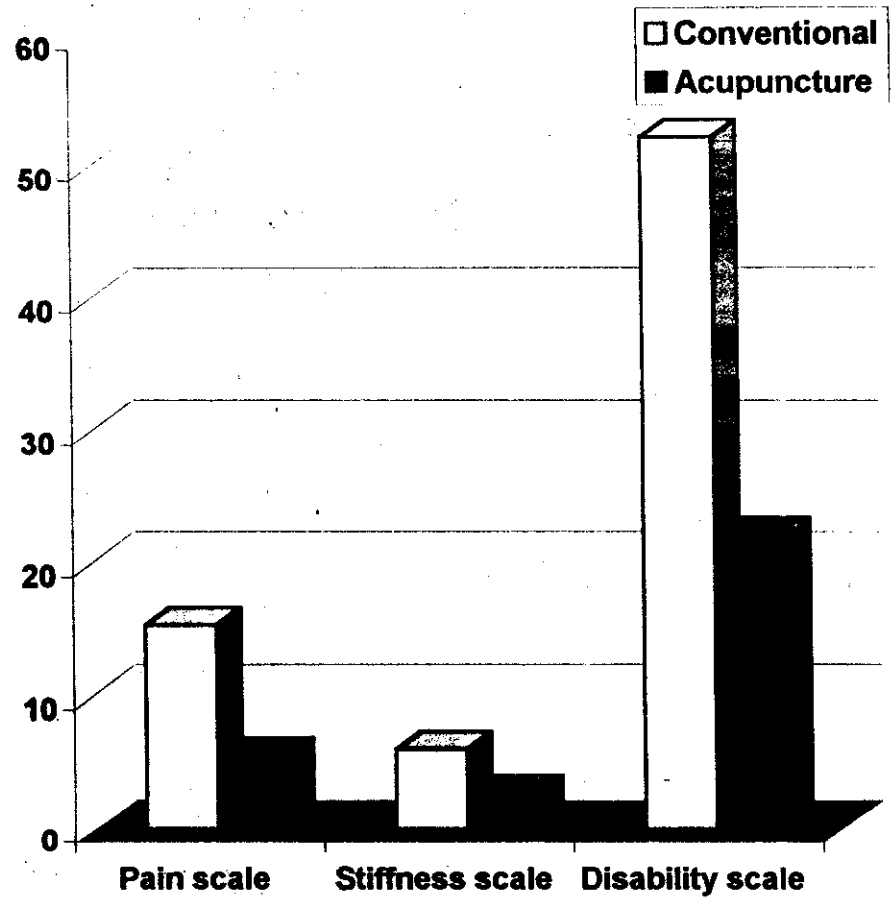


**Fig. (8): Womac scale at end of treatment of both the control and acupuncture groups**

**Table (11): Mean serum cortisol levels (at 8 a.m.) at baseline and at end of treatment in control group.**

| Mean serum cortisol level (μg%) | Baseline | End of treatment | P value |
|---|---|---|---|
| Range | 10-14 | 11-14 | >0.05 |
| Mean±SD | 11.8±1.13 | 12±1.15 | |

**Table (12): Mean serum cortisol levels (at 8 a.m.) at baseline and at end of treatment in acupuncture group.**

| Mean serum cortisol level (μg%) | Baseline | End of treatment | P value |
|---|---|---|---|
| Range | 10-16 | 21-29 | <0.05 |
| Mean±SD | 12.6±1.69 | 25.75±2.1 | |

**Table (13): Mean serum cortisol levels (at 8 a.m.) at end of treatment in both studied groups**

| Mean serum cortisol level (μg%) | Range | Mean±SD | P value |
|---|---|---|---|
| Control | 11-14 | 12±1.15 | <0.05 |
| Acupuncture | 21-29 | 25.75±2.1 | |

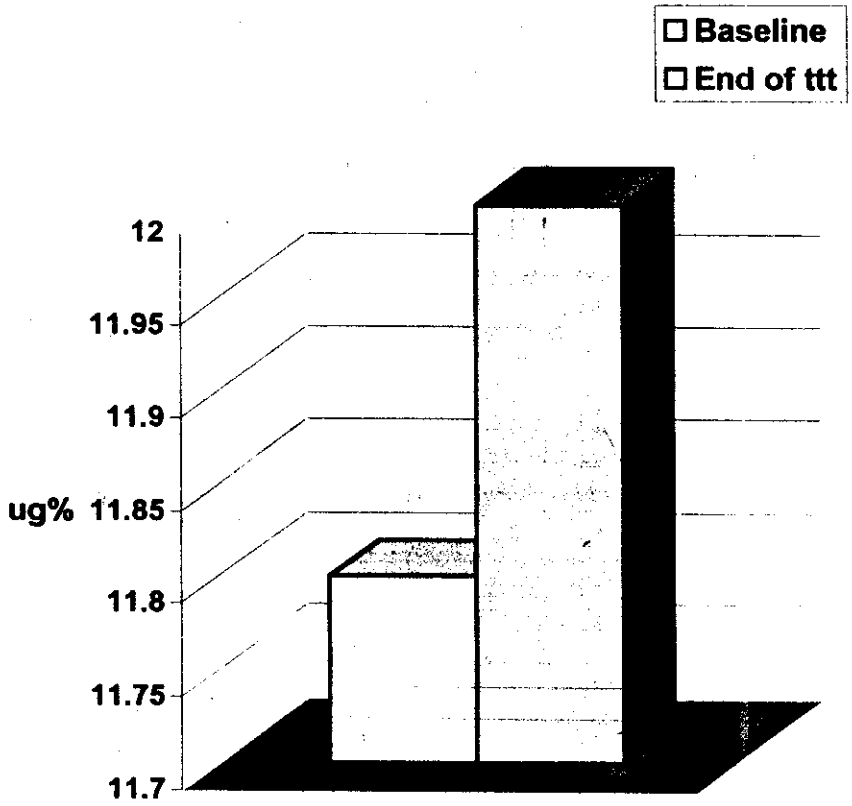


**Fig. (9): Mean serum cortisol levels in the control group**

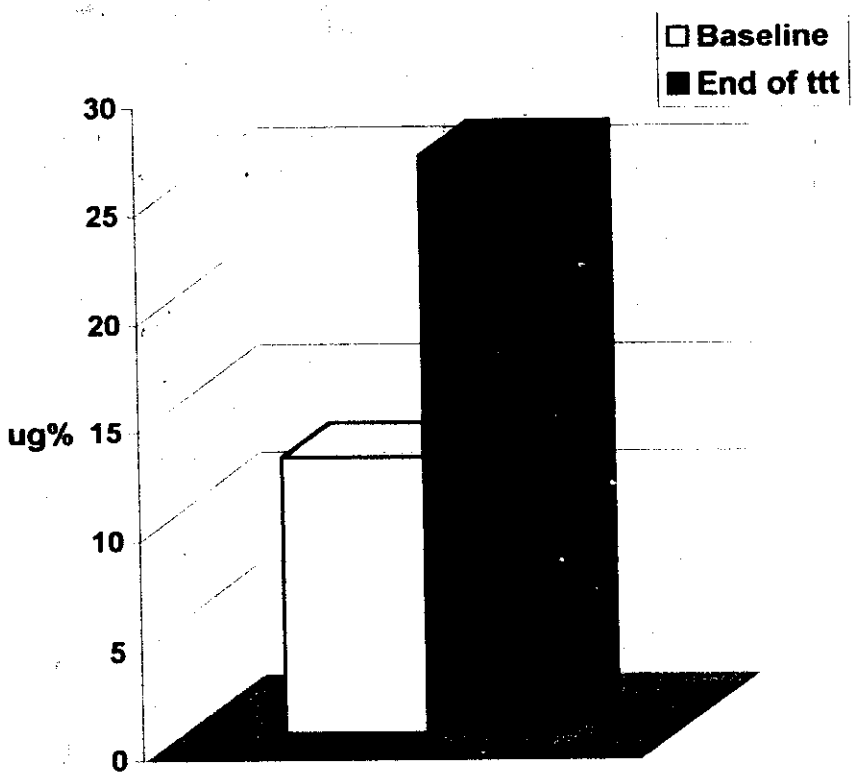


**Fig. (10): Mean serum cortisol levels of the acupuncture group**

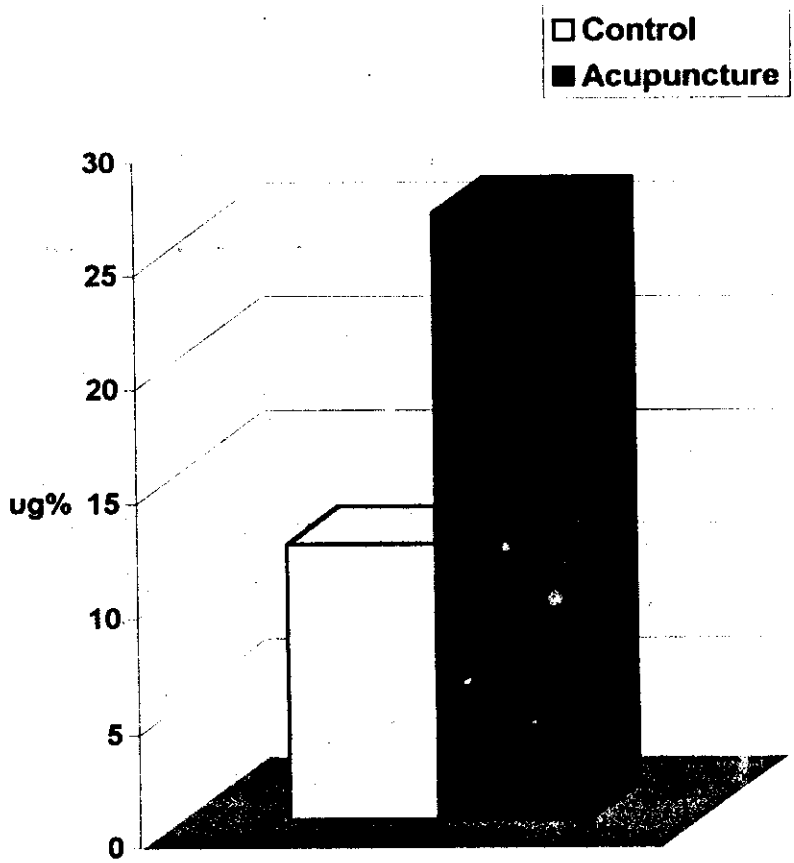


**Fig. (11): Mean serum cortisol levels in the control and acupuncture groups at end of treatment**

**Table (14) shows correlation coefficient (r) between morning serum cortisol levels and the use of both conventional treatment and acupuncture therapy**

| Serum cortisol | "r" | P value |
|---|---|---|
| Conventional treatment | 0.632 | <0.05 |
| Acupuncture therapy | 0.462 | >0.05 |

**Table (15) shows correlation coefficient (r) between morning serum cortisol levels and KPS and its subscales in acupuncture group.**

| Knee pain scale | "r" | P value |
|---|---|---|
| Transfer frequency subscale | -0.491 | <0.05 |
| Ambulation/climbing frequency subscale | -0.431 | <0.05 |
| Transfer intensity subscale | -0.443 | <0.05 |
| Ambulation/climbing intensity subscale | -0.413 | <0.05 |

**Table (16) shows correlation coefficient (r) between morning serum cortisol levels and WOMAC scale and its subscales in acupuncture group.**

| WOMAC scale | "r" | P value |
|---|---|---|
| WOMAC pain subscale | -0.452 | <0.05 |
| WOMAC stiffness subscale | -0.72 | <0.05 |
| WOMAC disability subscale | -0.591 | <0.05 |

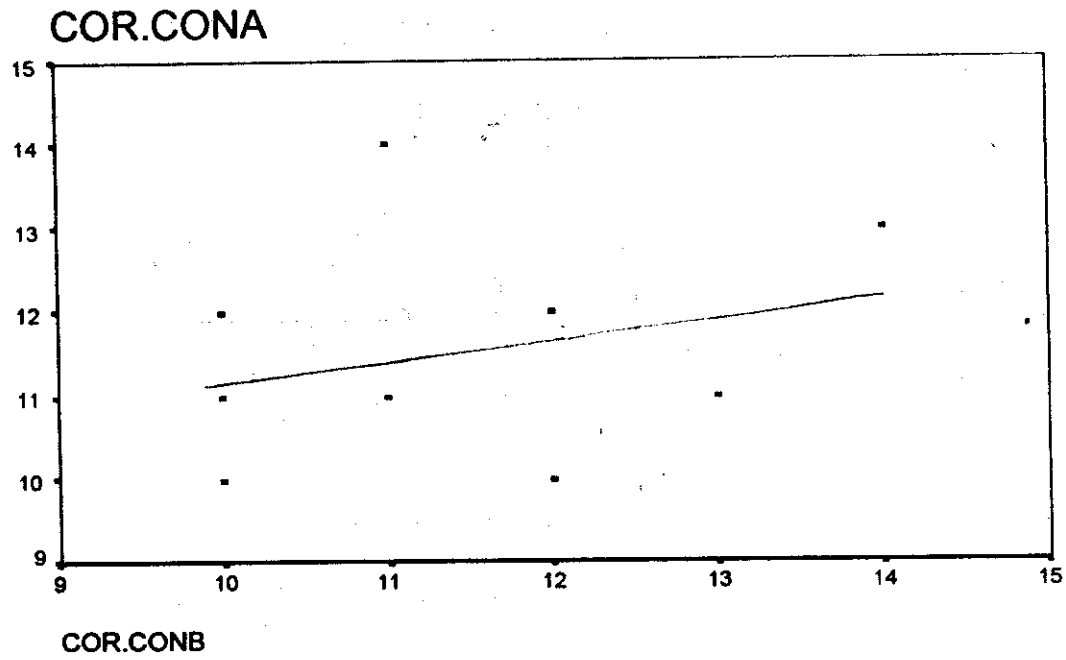


**Fig. (12-a): Correlation between serum cortisol and the use of conventional therapy**

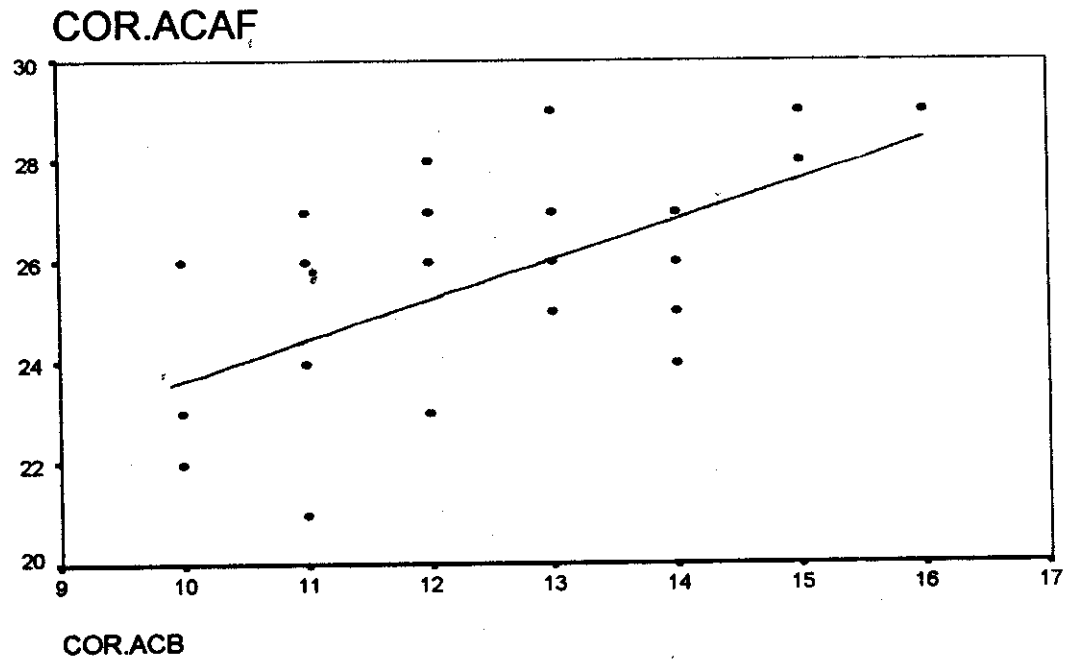


**Fig. (12-b): Correlation between serum cortisol and the use of acupuncture treatment**

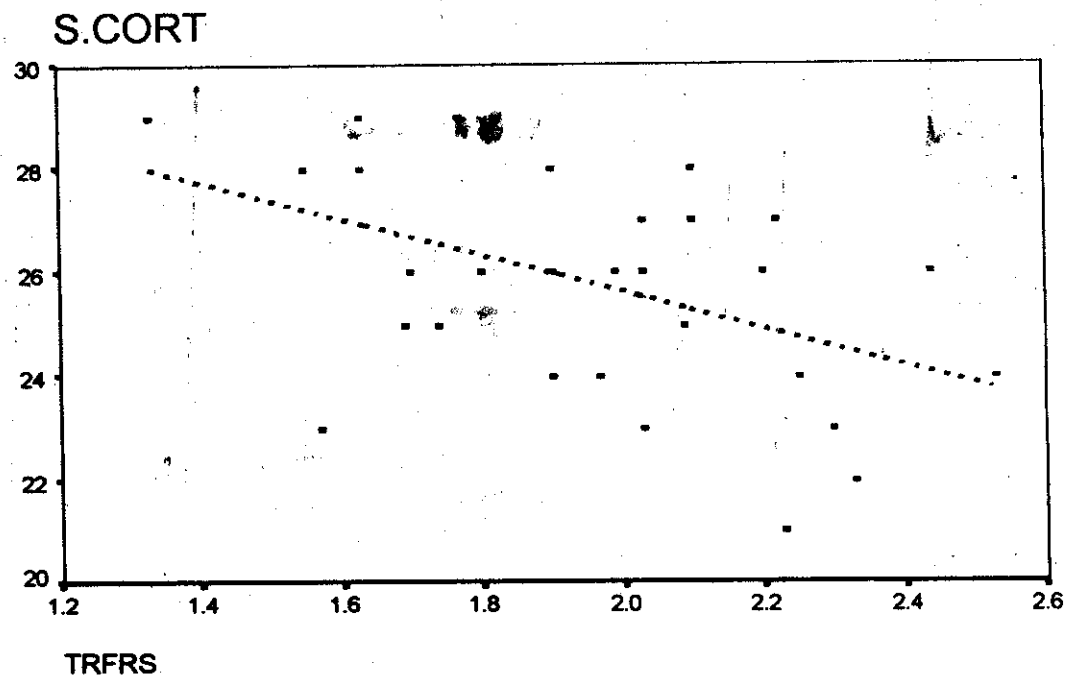


**Fig. (13-a): Correlation between serum cortisol and improvement in mean transfer frequency subscale of knees.**

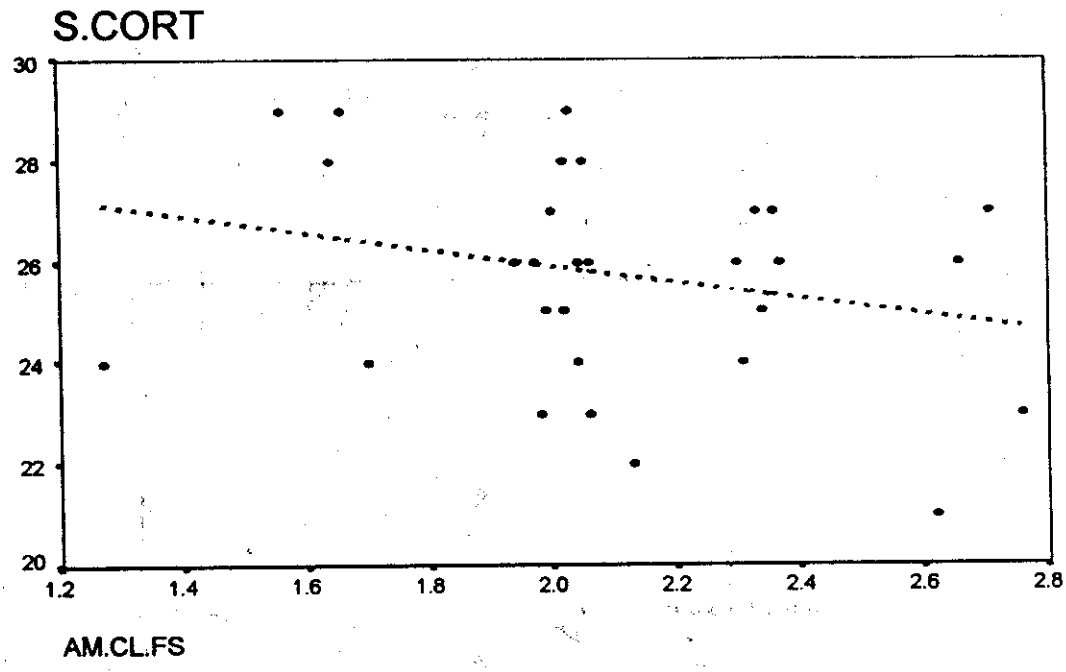


**Fig. (13-b): Correlation between serum cortisol and improvement in mean ambulation/climbing frequency subscale of knees.**

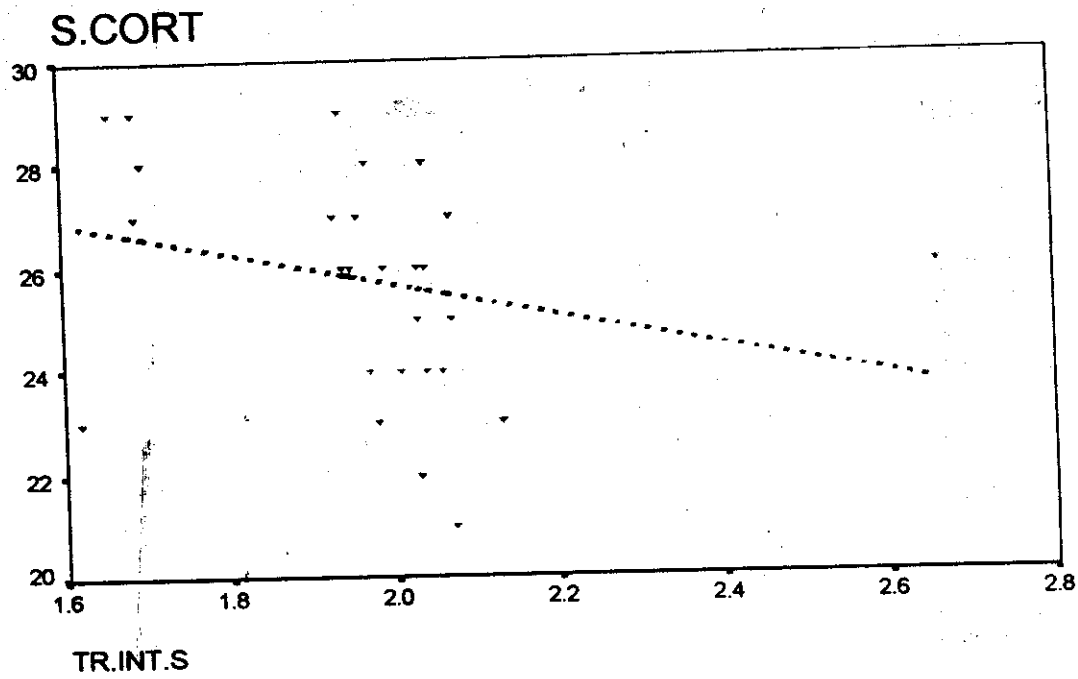


**Fig. (13-c): Correlation between serum cortisol and improvement in mean transfer intensity subscale of knees.**

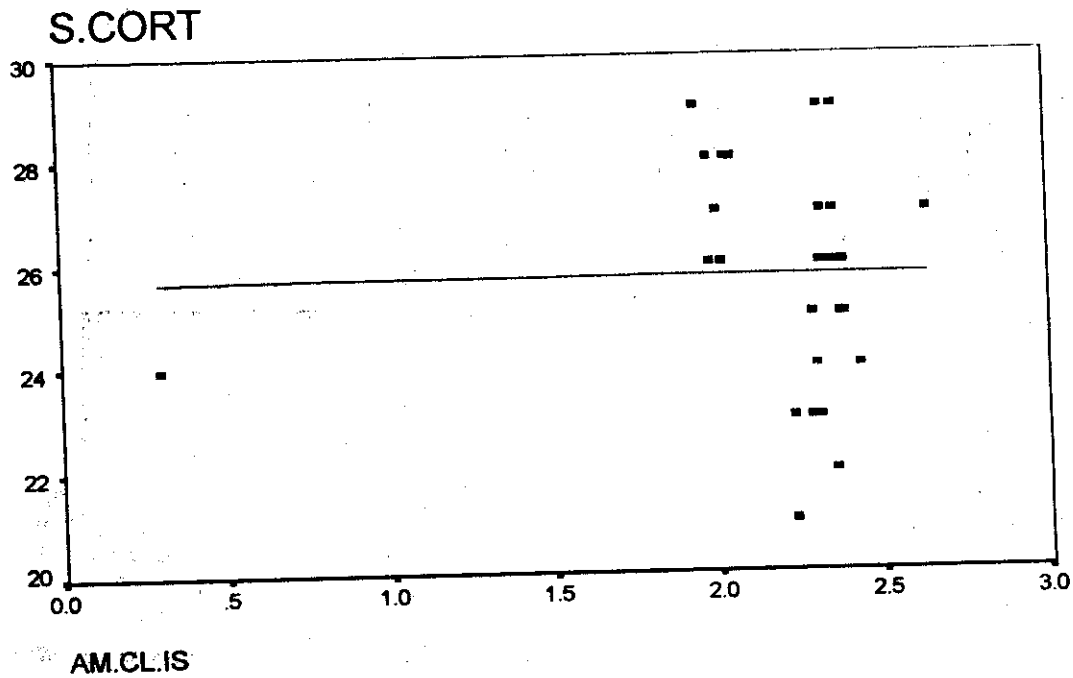


**Fig. (13-d): Correlation between serum cortisol and improvement in mean ambulation/climbing intensity subscale of knees.**

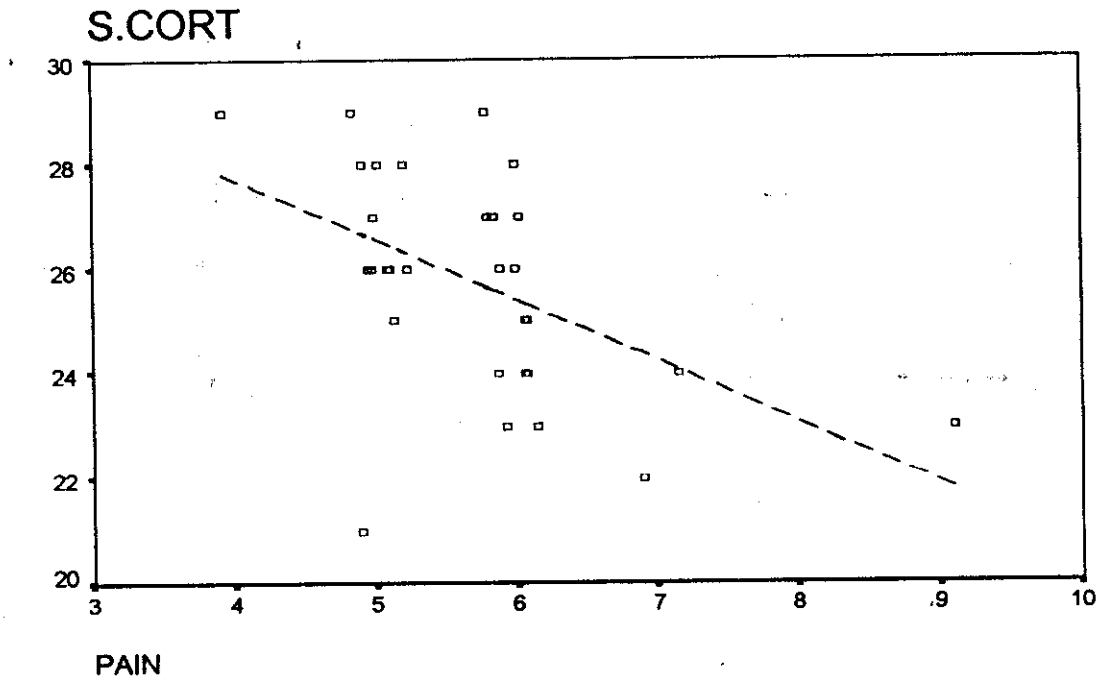


**Fig. (14-a): Correlation between serum cortisol and improvement in WOMAC pain subscale of knees.**

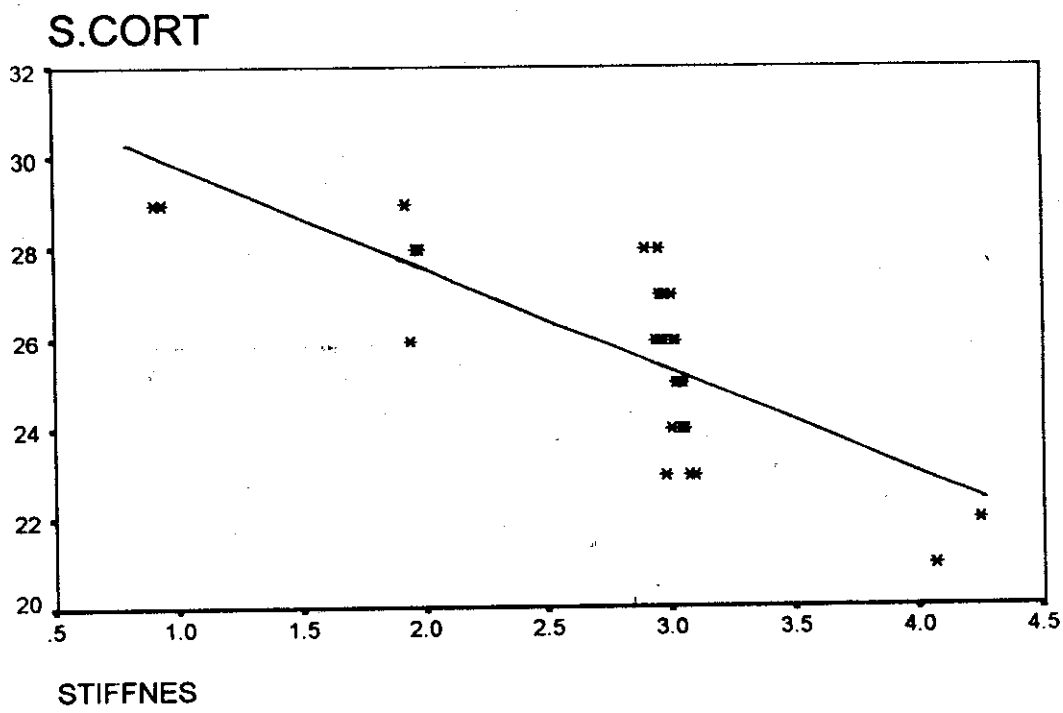


**Fig. (14-b): Correlation between serum cortisol and improvement in WOMAC stiffness subscale of knees.**

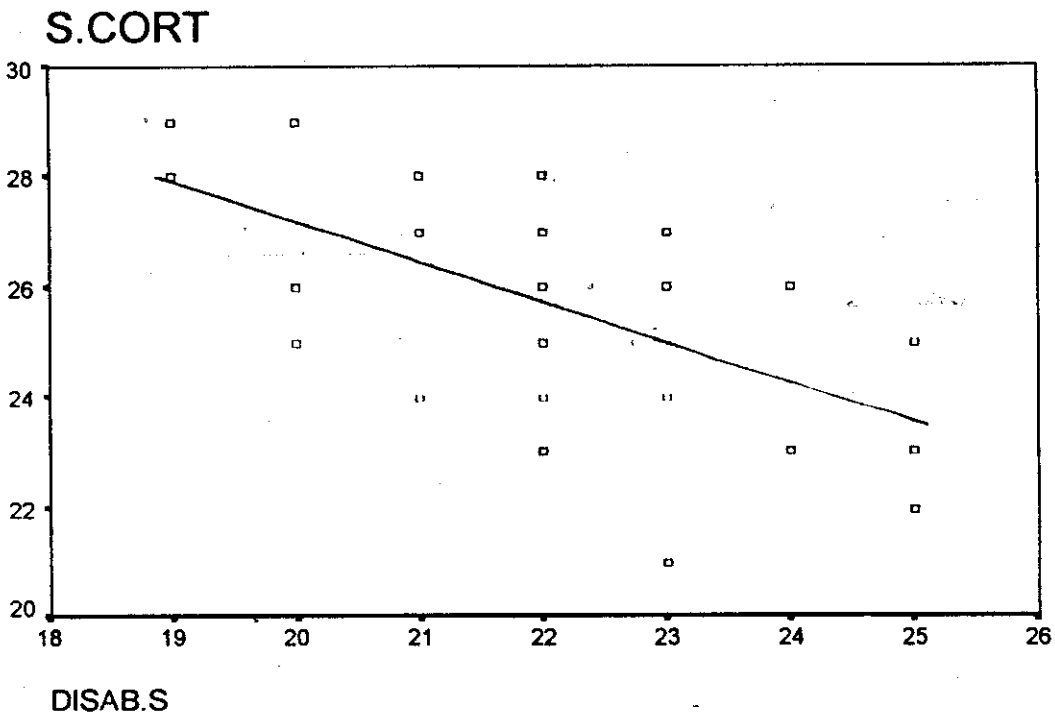


**Fig. (14-c): Correlation between serum cortisol and WOMAC disability subscale**

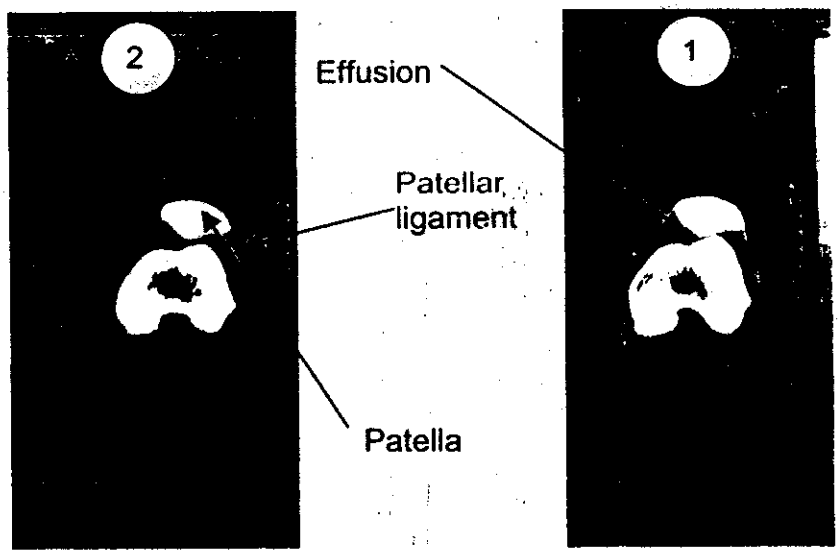


**Fig. (15): CT scanning of knee joint before and after conventional therapy**

1. Before conventional therapy
2. After conventional therapy

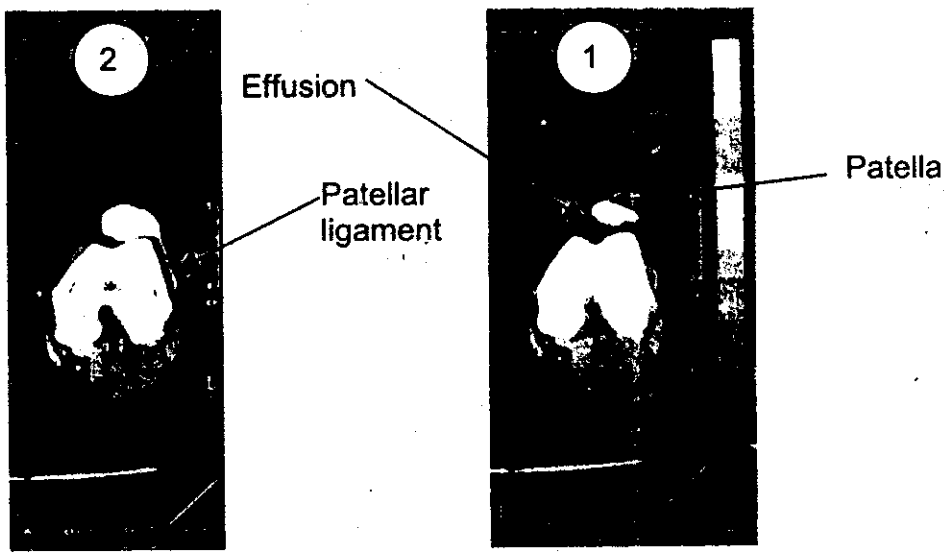


**Fig. (16): CT scanning of knee joint before and after acupuncture**

1. Before acupuncture
2. After acupuncture