
RESULTS

Chapter VII

RESULTS

This work included 50 women who used Depo Medroxyprogesterone Acetate "DMPA" injections for contraception. In these women, serum levels of calcium, magnesium, zinc, copper and manganese were determined before (a control level), then 48 hours, one week, 2 weeks, one month and 3 months after the first injection. All women attended the followup visits after 48 hours, one week, 2 weeks and one month and only 33 attended the 3 months followup visit.

I- THE EFFECT OF DMPA ON SERUM CALCIUM

This is shown in table 1. This table shows that there was a statistically significant decrease of mean serum calcium level 48 hours after DMPA injection ($P < 0.01$) and a statistically increase one month post-injection ($P < 0.05$), but the mean values were within the normal serum calcium range (9 to 11 mg/100 ml). There was no statistically significant change one week, 2 weeks and 3 months after the injection. The original mean serum calcium level was restored after 3 months of use.

Table 1. Range and mean serum calcium levels before and after administration of DMPA

| Time | No. of women | Range (mg/dl) | Mean \pm S.E. (mg/dl) | S.D. \pm (mg/dl) |
|------------------|--------------|---------------|---|--------------------|
| Before injection | 50 | 9.01-10.93 | 10.19 \pm 0.08 | 0.576 |
| After 48 hours | 50 | 9.04-11.06 | 9.85 \pm 0.08 Decreased (P<0.01) | 0.598 |
| After one week | 50 | 9.04-11.01 | 10.17 \pm 0.07 NS | 0.562 |
| After 2 weeks | 50 | 9.06-10.9 | 10.17 \pm 0.07 NS | 0.52 |
| After one month | 50 | 9.02-11.01 | 10.44 \pm 0.06 Increased (P<0.05) | 0.458 |
| After 3 months | 33 | 9.08-10.9 | 10.199 \pm 0.09 NS | 0.552 |

NS = Non Significant

II- THE EFFECT OF DMPA ON SERUM MAGNESIUM

This is shown in table 2. This table shows that there was no statistically significant change in serum magnesium levels after administration of DMPA injection up to 3 months.

Table 2. Range and mean serum magnesium levels before and after administration of DMPA

| Time | No. of women | Range (mg/dl) | Mean \pm S.E. (mg/dl) | S.D. \pm (mg/dl) |
|------------------|--------------|---------------|-------------------------|--------------------|
| Before injection | 50 | 1.49- 3.03 | 2.38 ± 0.05 | 0.42 |
| After 48 hours | 50 | 1.47- 2.99 | 2.42 ± 0.05 NS | 0.38 |
| After one week | 50 | 1.42- 2.95 | 2.4 ± 0.06 NS | 0.39 |
| After 2 weeks | 50 | 1.61- 3.06 | 2.49 ± 0.05 NS | 0.35 |
| After one month | 50 | 1.36- 3.04 | 2.42 ± 0.05 NS | 0.38 |
| After 3 months | 33 | 1.42- 2.98 | 2.27 ± 0.06 NS | 0.36 |

NS = Non Significant

III- THE EFFECT OF DMPA ON SERUM ZINC

This is shown in table 3. This table shows that there was a statistically significant decrease of mean serum zinc levels after 48 hours, one week, 2 weeks, one month and 3 months of use ($P < 0.01$), compared to mean levels before injection. However, the mean values at all these times were within the normal range of serum zinc (100-124 $\mu\text{g/dl}$).

Table 3. Range and mean serum zinc levels before and after administration of DMPA

| Time | No. of women | Range (µg/dl) | Mean \pm S.E. (µg/dl) | S.D. \pm (µg/dl) |
|------------------|--------------|---------------|--|--------------------|
| Before injection | 50 | 102 - 123 | 114.1 \pm 0.74 | 5.62 |
| After 48 hours | 50 | 100 - 122 | 108.02 \pm 0.76 Decreased (p<0.01) | 5.36 |
| After one week | 50 | 100 - 125 | 109.32 \pm 0.82 Decreased (p<0.01) | 5.8 |
| After 2 weeks | 50 | 100 - 120 | 109.6 \pm 0.78 Decreased (p<0.01) | 5.58 |
| After one month | 50 | 100 - 122 | 109.86 \pm 0.78 Decreased (p<0.01) | 5.52 |
| After 3 months | 33 | 100 - 119 | 109.78 \pm 0.97 Decreased (p<0.01) | 5.6 |

IV- THE EFFECT OF DMPA ON SERUM COPPER

This is shown in table 4. This table shows that there was no statistically significant changes in mean serum copper levels after DMPA use up to 3 months.

Table 4. Range and mean serum copper levels before and after administration of DMPA

| Time | No. of women | Range (µg/dl) | Mean \pm S.E. (µg/dl) | S.D. \pm (µg/dl) |
|------------------|--------------|---------------|-------------------------|--------------------|
| Before injection | 50 | 89 - 136 | 108.2 \pm 1.77 | 12.5 |
| After 48 hours | 50 | 86 - 133 | 109.4 \pm 1.49 NS | 10.5 |
| After one week | 50 | 96 - 128 | 108.5 \pm 1.04 NS | 7.3 |
| After 2 weeks | 50 | 92 - 123 | 109.2 \pm 1.1 NS | 7.8 |
| After one month | 50 | 86 - 123 | 107.1 \pm 1.28 NS | 9.09 |
| After 3 months | 33 | 94 - 121 | 110.0 \pm 1.21 NS | 6.9 |

NS = Non Significant

V- THE EFFECT OF DMPA ON SERUM MANGANESE

This is shown in table 5. This table shows that there was a statistically significant decrease of mean serum manganese 48 hours, one week, 2 weeks after DMPA injection ($P < 0.05$), but the level was within the normal range of serum manganese (1 to 3 $\mu\text{g/dl}$). There was no statistically significant changes after one month and 3 months, compared to the mean value before injection.

Table 5. Range and mean serum manganese levels before and after administration of DMPA

| Time | No. of women | Range ($\mu\text{g/dl}$) | Mean \pm S.E. ($\mu\text{g/dl}$) | S.D. \pm ($\mu\text{g/dl}$) |
|------------------|--------------|----------------------------|--|---------------------------------|
| Before injection | 50 | 1.19-2.99 | 2.18 ± 0.06 | 0.45 |
| After 48 hours | 50 | 1.02-2.91 | 1.9 ± 0.06 Decreased ($p < 0.05$) | 0.47 |
| After one week | 50 | 1.05-2.98 | 1.98 ± 0.07 Decreased ($p < 0.05$) | 0.54 |
| After 2 weeks | 50 | 1.01-2.92 | 1.97 ± 0.06 Decreased ($p < 0.05$) | 0.49 |
| After one month | 50 | 1.07-2.87 | 1.97 ± 0.07 NS | 0.51 |
| After 3 months | 33 | 1.39-2.89 | 2.32 ± 0.05 NS | 0.34 |

NS = Non Significant

Table 6. compiles the mean values (\pm S.E.) of serum calcium, magnesium, zinc, copper and manganese in women who used DMPA injections before, 48 hours, one week, 2 weeks, one month and 3 months after injection.

Table 6. Compiled mean values (\pm S.E.) of serum calcium, magnesium, zinc, copper and manganese before and after administration of DMPA

| Time | No. of women | Calcium Mean \pm S.E. (mg/dl) | Magnesium Mean \pm S.E. (mg/dl) | Zinc Mean \pm S.E. (μ g/dl) | Copper Mean \pm S.E. (μ g/dl) | Manganese Mean \pm S.E. (μ g/dl) |
|-------------------------------|--------------|---|---|--|--|--|
| Before injection (control) | 50 | 10.19 \pm 0.08 | 2.38 \pm 0.05 | 114.1 \pm 0.74 | 108.2 \pm 1.77 | 2.18 \pm 0.06 |
| After 48 hours | 50 | 9.85 \pm 0.08 Decreased ($p < 0.01$) | 2.42 \pm 0.05 NS | 108.02 \pm 0.76 Decreased ($p < 0.01$) | 109.4 \pm 1.49 NS | 1.9 \pm 0.06 Decreased ($p < 0.05$) |
| After one week | 50 | 10.17 \pm 0.07 NS | 2.4 \pm 0.06 NS | 109.32 \pm 0.82 Decreased ($p < 0.01$) | 108.5 \pm 1.04 NS | 1.98 \pm 0.07 Decreased ($p < 0.05$) |
| After 2 weeks | 50 | 10.17 \pm 0.07 NS | 2.49 \pm 0.05 NS | 109.6 \pm 0.78 Decreased ($p < 0.01$) | 109.2 \pm 1.1 NS | 1.97 \pm 0.06 Decreased ($p < 0.05$) |
| After one month | 50 | 10.44 \pm 0.06 Increased ($p < 0.05$) | 2.42 \pm 0.05 NS | 109.86 \pm 0.78 Decreased ($p < 0.01$) | 107.1 \pm 1.28 NS | 1.97 \pm 0.07 NS |
| After 3 months | 33 | 10.19 \pm 0.09 NS | 2.27 \pm 0.06 NS | 109.78 \pm 0.97 Decreased ($p < 0.01$) | 110 \pm 1.21 NS | 2.32 \pm 0.05 NS |

NS = Non Significant

Table 7. shows the mean values (\pm S.E.) of serum calcium, magnesium, zinc, copper and manganese before and 3 months after administration of DMPA injection.

Table 7. Mean value of serum calcium, magnesium, zinc, copper and manganese before and 3 months after DMPA injection .

| Element | No. of women | Mean \pm S.E. | S.D. \pm | Range | Change |
|--|--------------|---------------------------------------|----------------|-----------------------------|-----------------------|
| Calcium (mg/dl). Before injection. After 3 months. | 50 33 | 10.19 \pm 0.08 10.199 \pm 0.09 | 0.576 0.552 | 9.01 - 10.93 9.08 - 10.9 | NS NS |
| Magnesium (mg/dl). Before injection. After 3 months. | 50 33 | 2.38 \pm 0.05 2.27 \pm 0.06 | 0.42 0.36 | 1.49 - 3.03 1.42 - 2.98 | NS |
| Zinc (μ g/dl). Before injection. After 3 months. | 50 33 | 114.1 \pm 0.74 109.78 \pm 0.97 | 5.62 5.6 | 102 - 123 100 - 119 | Decreased (p<0.01) |
| Copper (μ g/dl). Before injection. After 3 months. | 50 33 | 108.2 \pm 1.77 110 \pm 1.21 | 12.5 6.9 | 89 - 136 94 - 121 | NS |
| Manganese (μ g/dl). Before injection. After 3 months. | 50 33 | 2.18 \pm 0.06 2.32 \pm 0.05 | 0.45 0.34 | 1.19 - 2.99 1.39 - 2.89 | NS |

NS = Non Significant
N.B. The dose of DMPA was 150 mg every 90 days (three months).