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## **A study on injectable DMPA (Depomedroxy Progesterone Acetate) and effect of its use as a short term contraception in immediate postpartum women**

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**Abstract**---Background and Aim: Contraception in the postpartum period is a significant problem. When used correctly, injectable hormonal contraceptives are one of the most reliable methods of contraception currently available. The purpose of the present study was to assess the effect of injectable DMPA as a short term contraceptive in immediate postpartum women. Patients and Methods: This prospective observational study was conducted on 130 postpartum women in the Gynaecology Department of Ayub Teaching Hospital, Abbottabad from December 2018 to December 2019. The study group of 130 postpartum women were given injectable DMPA 150 mg intramuscularly during discharge from hospital and after three months. The mother was subjected to a complete general physical examination. The need of exclusive breast feeding was emphasized. Fasting blood samples were collected for liver function testing (LFT), lipid profile, blood sugar, haemoglobin (Hb). About 130 postpartum women who were not taking any hormonal contraceptive were considered a control group. All the patients were followed-up for six weeks, three months, and six months. Data analysis was done using SPSS version 27. Results: The overall mean age of study group was  $24.6 \pm 2.9$  years with an age range 20 to 34 years. The overall mean age of control group patients was  $25.72 \pm 4.64$  years with an age

range 20-34 years. Regarding the socio-demographic status, about 56% and 47% women were illiterate in study and control group respectively. The incidence of unplanned current pregnancy in study and control group was 67% and 56.7% respectively. The weight gain in study group after 3 and 6 months were significantly higher in study group as compared to control group. Comparing the hemoglobin mean level, there were significant rise in hemoglobin level of study group after 3 months ( $0.85 \pm 0.39$  gm %) and 6 months ( $1.2 \pm 0.43$ ) against the control group 3 months ( $0.47 \pm 0.48$  gm %) and 6 months ( $0.45 \pm 0.48$ ) respectively. There were elevated level of LDL (low density lipoprotein), triglyceride (TG), and fall in HDL (high density lipoprotein) were observed in a study group. Liver function test (LFT), blood pressure, and blood sugar remained unaffected and were insignificant. About 74% women had irregular bleeding at six weeks and 9% at six months. The incidence of amenorrhea was significantly higher (58%) in study group as compared to control group (28%). There were no cases of pregnancy among DMPA users, where as nine women in the control group conceived throughout the research period. Conclusion: The administration of injectable DMPA in the immediate postpartum period is a safe and effective approach with no adverse metabolic consequences. It is very simple to use and does not require the woman to be monitored after birth. Nevertheless, DMPA should only be administered once lactation has been established and breast feeding has been adequately commenced.

**Keywords**--postpartum women, injectable DMPA, contraceptive.

## Introduction

Family planning is critical for controlling and stabilization of population and growth of maternal and child health [1]. The unmet demand for contraceptive was 13% with sole purpose of using for spacing technique based on National Family Health Survey 3 (NFHS - 3) [2]. Globally injectable contraception was introduced as a new type of contraception. In underdeveloped nations, about 17% of women of reproductive age have unmet family planning requirements [3, 4], and 20.6% of pregnancies occur after prior breastfeeding [5]. The rate of unwanted pregnancy was reported to be 12.8 per 100 women per year within the first year postpartum and non-use of contraception accounting for 86% of the cases [6]. Progesterone-only contraception in the form of injectable DMPA is a highly successful method of contraception, particularly during the postpartum period. Most procedure's side effects are only inconvenient rather than risky.

DMPA is being utilized in numerous countries [7]. Numerous women considered amenorrhea induced by injectable contraceptive as advantageous and expedient. The efficacy of injectable contraceptives was shown to be greater than 99% when used consistently and correctly [8]. DMPA is the fourth most often used contraceptive in the world. It is widely utilized as a safe, effective, and accepted measure all across the world [9]. Early postpartum treatment of depomedroxy progesterone acetate raises theoretical concerns about newborn safety and

premature breastfeeding suppression (DMPA) [10]. Nevertheless, a previous research show that newborns cannot efficiently metabolize or absorb progestin until three months of age, and the quantity of hormone transmitted is just 0.05% of the maternal dosage [11]. Additional concern is supply and quantity of milk by DMPA interference and it has been demonstrated that progesterone-only contraception may not impede breastfeeding [12, 13]. The current study aims to assess the influence of short-term injectable DMPA usage in the early postpartum period.

## **Methodology**

### **Study Design and Setting**

This prospective observational study was conducted on 130 postpartum women in the Gynaecology Department of Ayub Teaching Hospital, Abbottabad from December 2018 to December 2019.

### **Procedure**

The study group of 130 postpartum women was given injectable DMPA 150 mg intramuscularly during discharge from hospital and after three months. The mother was subjected to a complete general physical examination. The need of exclusive breast feeding was emphasized. Fasting blood samples were collected for liver function testing (LFT), lipid profile, blood sugar, haemoglobin (Hb). About 130 postpartum women who were not taking any hormonal contraceptive were considered a control group. All the patients were followed-up for six weeks, three months, and six months.

### **Exclusion Criteria**

Women who were grand multipara, had preterm or intrauterine growth retardation (IUGR) babies, were undernourished or seriously anemic, or were unable to commence nursing, on the other hand, were excluded.

### **Data Collection**

Women were assessed for monthly irregularity, length and frequency of breastfeeding, and effects on blood tests at six weeks, three months, and six months. At each appointment, the mother's side symptoms (headache, dizziness, acne, abdomen bloating, breast swelling, mood changes, alopecia, and weight gain) were evaluated and questions were answered. Menstrual irregularities such as spotting, irregular bleeding, and menorrhagia were thoroughly evaluated. Severe, moderate, and mild were different severity grades of irregular bleeding. Mild irregularity was defined as spotting alone, which is less than a woman's menstruation. Menstruation was similar to moderate hemorrhage. Persistent and excessive bleeding was seen as a serious anomaly. After six months, all women were offered the option of continuing with injectable contraception or switching to another technique.

## Data Analysis

SPSS version 27 was used for data analysis. The student t-test was used to compare the means of two groups. The Chi-square or Fisher exact test was used to determine the relationship between two category variables. P value 0.05 was considered significant.

## Results

The overall mean age of study group was  $24.6 \pm 2.9$  years with an age range 20 to 34 years. The overall mean age of control group patients was  $25.72 \pm 4.64$  years with an age range 20-34 years. Regarding the socio-demographic status, about 56% and 47% women were illiterate in study and control group respectively. The incidence of unplanned current pregnancy in study and control group was 67% and 56.7% respectively. The weight gain in study group after 3 and 6 months were significantly higher in study group as compared to control group. Comparing the haemoglobin mean level, there were significant rise in haemoglobin level of study group after 3 months ( $0.85 \pm 0.39$  gm %) and 6 months ( $1.2 \pm 0.43$ ) against the control group 3 months ( $0.47 \pm 0.48$  gm %) and 6 months ( $0.45 \pm 0.48$ ) respectively. There were elevated level of LDL (low density lipoprotein), triglyceride (TG), and fall in HDL (high density lipoprotein) were observed in a study group. Liver function test (LFT), blood pressure, and blood sugar remained unaffected and were insignificant. About 74% women had irregular bleeding at six weeks and 9% at six months. The incidence of amenorrhea was significantly higher (58%) in study group as compared to control group (28%). There were no cases of pregnancy among DMPA users, whereas nine women in the control group conceived throughout the research period. Comparison of weight gain effected by DPMA in both groups are shown in Table-I. Effect of DPMA on lipid profile of both groups are shown in Table-II. Table-III represents the effect of DPMA on mean blood sugar during six weeks, three months, and six months. Table-IV shows the DPMA effect on liver test function in both groups. Effect of DPMA on menstrual pattern and irregular bleeding are shown in Table-V.

Table I  
Comparison of weight gain by DPMA in both groups

| Duration     | Weight gain in Study group (N=130) | Weight gain in Control group (N=130) | P-value |
|--------------|------------------------------------|--------------------------------------|---------|
| Six weeks    | $-2.82 \pm 1.74$                   | $-2.59 \pm 0.69$                     | 0.31    |
| Three months | $0.69 \pm 1.11$                    | $0.03 \pm 1.10$                      | <0.01   |
| Six months   | $1.35 \pm 1.21$                    | $0.41 \pm 1.21$                      | <0.01   |

Table II  
Effect of DPMA on lipid profile of both groups

| Groups        | Duration  | TG (mg %)         | LDL (mg %)        | HDL             | Total Cholesterol (mg %) |
|---------------|-----------|-------------------|-------------------|-----------------|--------------------------|
| Study group   | Six weeks | $110.17 \pm 12.2$ | $106.12 \pm 11.4$ | $52.39 \pm 6.5$ | $181.83 \pm 13.59$       |
| Control group | 3         | 3                 | 2                 | 1               | $183.67 \pm 14.64$       |

|               |              |                  |                  |                |              |
|---------------|--------------|------------------|------------------|----------------|--------------|
|               |              | 107.89±11.7<br>2 | 108.87±12.4<br>9 | 52.75±6.8<br>9 |              |
| Study group   | Three months | 113.35±9.83      | 111.74±9.56      | 53.14±5.4      | 187.29±10.03 |
| Control group |              | 115.01±13.8<br>7 | 110.52±9.28      | 54.37±7.0<br>3 | 188.89±12.94 |
| Study group   | Six months   | 116.13±9.43      | 116.31±9.59      | 50.08±4.3      | 190.59±8.56  |
| Control group |              | 111.84±13.3<br>2 | 111.98±11.4<br>2 | 53.21±7.8<br>4 | 188.69±11.95 |

Table III  
Effect of DPMA on mean blood sugar (Mean BP) during six weeks, three months, and six months

| Duration     | Mean BP in Study group (N=130) | Mean BP in Control group (N=130) | P-value |
|--------------|--------------------------------|----------------------------------|---------|
| Six weeks    | 98.53±10.64                    | 103.84±11.34                     | 0.0006  |
| Three months | 104.29±10.89                   | 99.63±11.83                      | 0.0001  |
| Six months   | 104.67±11.15                   | 101.79±12.24                     | 0.31    |

Table IV  
DPMA effect on liver test function in both groups

| Groups        | Duration     | Bilirubin (mg %) | SGOT IU/L  | SGPT IU/L      | Alkaline Phosphatase IU/L |
|---------------|--------------|------------------|------------|----------------|---------------------------|
| Study group   | Six weeks    | 0.49±0.34        | 21.42±4.89 | 2.09±4.49      | 71.41±13.24               |
| Control group |              | 0.59±0.29        | 23.63±6.69 | 23.14±5.4<br>2 | 74.19±17.03               |
| Study group   | Three months | 0.61±0.22        | 21.23±4.59 | 21.83±5.4      | 74.85±12.94               |
| Control group |              | 0.54±0.32        | 20.62±4.20 | 22.21±4.8<br>7 | 74.72±12.49               |
| Study group   | Six months   | 0.51±0.34        | 22.53±5.10 | 22.82±4.4      | 70.89±12.19               |
| Control group |              | 0.55±0.29        | 24.14±5.13 | 23.69±5.5<br>2 | 72.49±13.76               |

Table V  
Effect of DPMA on menstrual pattern and irregular bleeding in both groups

| Groups        | Duration     | Normal menstrual bleeding | Absent     | Irregular bleeding |
|---------------|--------------|---------------------------|------------|--------------------|
| Study group   | Six weeks    | 2 (1.54%)                 | 28 (21.5%) | 96 (74%)           |
| Control group |              | 0 (0)                     | 24 (18.5%) | 79 (60.8%)         |
| Study group   | Three months | 42 (32.3%)                | 44 (33.8%) | 35 (26.9%)         |
| Control group |              | 41 (31.5%)                | 43 (33.1%) | 12 (9.2%)          |
| Study group   | Six months   | 43 (33.1%)                | 54 (41.5%) | 12 (9%)            |
| Control group |              | 68 (52.3%)                | 32 (24.6%) | 4 (3.1%)           |

## Discussion

The current study was designed to investigate the metabolic implications of starting injectable progestogen (DMPA) contraception in the postpartum period. The current study's large percentage of unintended births is comparable to prior research, where 67% and 49% of pregnancies were unplanned, respectively [14, 15]. This high percentage of unintended births demonstrates that either present contraceptive options are unacceptable to couples or contraception information is insufficient. Contraception acceptability is closely related to parity; although 68% of women with more than three surviving children use contraception, just 5% of those with no living children do [16]. During three and six months of follow-up, we found a substantial increase in Hb in the study group. Hb rises in the study group ranged from 0.3 to 2.2 gm/dl. A comparable rise in hemoglobin was seen in women using hormonal contraceptives, ranging between 0.2 and 0.7 gm%. The increase in Hb found in DMPA users might be due to amenorrhea or decreased menstrual flow.

The contraceptive acceptors mean age was reported significantly higher since the survey respondents used all kinds of contraception [17]. In the current study, over two-thirds of the users cited irregular menstruation problems as the reason for quitting, which was consistent with the findings of another study. This study identified irregular menstruation (74%), as well as amenorrhea (58%), as major causes [18]. Lactation in postpartum women remained unaltered after taking injectable contraceptives, which was fairly comparable to our study, where 76.56% of users reported no breastfeeding problems [19]. Damtie et al. in her study found that safe and effective contraceptive strategy during early postpartum period was to use injectable DMPA [20]. Another study conducted on 457 postpartum women revealed a frequency of 55.1%. The most popular permanent procedure was tubectomy, whereas the most common temporary option was male condoms. In compared to a recent survey, the prevalence of "Antara" use was fairly low (4.7% vs. 30.2%) [21].

With continued usage, the amount of weight gain may rise. Another investigation on 700 postpartum women reported that significant weight gain was seen in women who completed DMPA users [22]. Another comprehensive investigation found that DMPA causing weight gain was not associated with adult's baseline weight [23]. Another study that looked at plasma lipids in groups of women who used DMPA found little or no change in mean triglyceride and total cholesterol levels, but in all seven trials that tested mean HDL cholesterol levels, the DMPA users had lower levels. Three of the five studies that assessed LDL cholesterol found an increase among DMPA users [24]. It has been discovered that DMPA users are more likely to acquire unusually low HDL levels, as well as abnormally high LDL levels and an increase in the LDL to HDL cholesterol ratio [25]. Even if DMPA was continued, the unfavorable effects on blood lipids were only temporary, and levels rose over time.

The present study found that no significant changes in blood sugar were seen in the study group. Similarly, a prior research used an intravenous glucose tolerance test to investigate carbohydrate metabolism, and it was discovered that progestogens had no effect on carbohydrate metabolism [26]. Another trial

employing DMPA on 80 uncomplicated diabetic women found a substantial increase in blood sugar levels at three, six, and nine months [27]. A cross-sectional research examined the metabolic alterations in 57 women who had been using DMPA for at least five years. Users had greater alkaline phosphatase levels than controls, but there was no significant difference in serum bilirubin, SGOT, or SGPT readings [28].

Menstrual alterations occur in virtually all DMPA users and are the most common reason of discontinuation. The primary menstruation disorders found in this study were amenorrhea and irregular bleeding. According to one study, the amenorrhea rate is 20% after three months of usage and 70% after one year [29]. According to another research, the incidence of unplanned bleeding or spong days is around 70% in the first 30 years and decreases to approximately 10% thereafter [30]. Amenorrhea affects around 50% of DMPA users after the first year of usage and approximately 70% in the second year [31]. Some women, however, may consider amenorrhea (along with a reduction or elimination of monthly pains) to be one of the benefits of utilizing this approach.

### **Conclusion**

The administration of injectable DMPA in the immediate postpartum period is a safe and effective approach with no adverse metabolic consequences. It is very simple to use and does not require the woman to be monitored after birth. Nevertheless, DMPA should only be administered once lactation has been established and breast feeding has been adequately commenced. Pre-use counselling for first irregular bleeding and subsequent amenorrhea will increase DMPA's acceptability, satisfaction, and retention rate as a postpartum contraceptive.

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