

## Blood Calcium Level on *Depo Medroxy Progesterone Acetate* (Dmpa) Hormonal Contraception Users For 2 Years

Henry K D Silaen, Aswar Aboet, M. Oky Prabudi, Sanusi Piliang,  
Rushakim Lubis, Deri Edianto

Departement of Obstetrics dan Gynecology Faculty of Medicine, University of North Sumatera

---

### Abstract

**Background:** Indonesia is the fifth largest population country of 249 million people and one of the cause is high birth rate. To overcome this, the government runs the Family Planning program. According to RISKESDAS, 46.87% of reproductive age women who use injectable contraception and 6.4% -7.7% experienced decreased of bone density, causing the decrease of calcium as one of bone mineral component.

**Objective:** To determine the difference between blood calcium level on *Depo Medroxy Progesterone Acetate* hormonal contraception users for 2 years with non DMPA users.

**Methods:** This study is an analytic study with cross sectional design conducted at Puskesmas Johor Medan, from June 2017-August 2017. 60 study subjects were divided into non DMPA users group and DMPA users group. On both groups, 5 cc of blood was drawn from median cubiti vein to assess the serum calcium level. Data was analyzed by using T-test and Mann-Whitney test.

**Results:** The mean age of DMPA and non DMPA users was  $38.40 \pm 3.244$  years old and  $37.73 \pm 2.753$  years old. The mean body mass index of DMPA and non DMPA users was  $23.1913 \pm 1.67$  and  $24.06 \pm 2.34$ . The mean calcium levels in DMPA and non DMPA users were  $9.51 \pm 0.50$  and  $9.64 \pm 1.21$ , and no significant difference of calcium level in both groups ( $p > 0.05$ ).

**Conclusion:** There was no significant difference in calcium levels between DMPA user after 2 years and non DMPA users ( $p > 0.05$ ).

**Keywords:** *Depo Medroxy Progesterone Acetate*, calcium level

---

Date of Submission: 17-12-2017

Date of acceptance: 08-01-2018

---

### I. Introduction

Maternal mortality in Indonesia is still being a health problem in Indonesia until this time. The maternal mortality rate during pregnancy, labor and the puerperal period of 359 per 100,000 live births. The high rate of birth also plays a major role in increasing maternal mortality.<sup>1-4</sup>

In addition to increasing maternal mortality, increased birth rates are also a major cause of population growth. Indonesia's Demographic and Health Survey (SDKI), from 2007 to 2012, the total number of birth in Indonesia is stuck at 2.6 children per woman so the BKKBN targets to decline the total birth rate to 2.28 children per woman. For this phenomenon the government promotes the use of contraception as a way to reduce the birth rate. The most preferred contraception is the injection contraceptive method of 48.56% and the second most is the birth control pill of 26.60%. One of the most widely used methods of hormonal injections in the community is the depot medroxyprogesterone acetate (DMPA).<sup>3,5-6</sup> Depot medroxyprogesterone acetate (DMPA) is a hormonal contraceptive method containing single progesterone (progestin) administered by injection every three months. Although very effective in preventing pregnancy, the use of DMPA is inseparable from the side effects that can arise to the user, mainly because the main component of the contraceptive method is the hormonal component.<sup>7-11</sup> The use of DMPA is associated with a decrease in bone mineral density that makes the user particularly susceptible to future osteoporosis and bone fractures. Loss of bone mineral density will be more and more along with the longer use of DMPA. Because calcium is one of the most important components of bone mineral, so if there is a decreased in bone mineral density as by the use of DMPA, it will literally affect the levels of calcium in the blood. Based on the above theory it is necessary to further investigate the blood calcium levels in DMPA hormonal contraceptive users (acceptors) after two years of use to anticipate unwanted side effects.<sup>12-15</sup>

Based on the theory above, it is necessary to investigate the blood calcium levels in DMPA hormonal contraceptive users (acceptors) after two years use for anticipating the unwanted side effects.

## II. Method

This study was an analytical study with cross sectional design using data from clinical and laboratory examination of women using hormonal contraceptive DMPA and without using for 2 years at Puskesmas Johor Medan, North Sumatera in cooperation with BKKBN North Sumatera which was conducted in June-August 2017. The subjects of this study were women using hormonal contraceptive DMPA, while the comparison group in this study were women who were not using the DMPA who fulfill the inclusion criteria. The samples in this research is 58 samples by using a calculation of samples count of two groups of unpaired numerical analytic samples. (CI = 95%).

The inclusion criteria in this study were women in fertile age between 20-45 years old, who have received DMPA hormonal for at least 2 years, did not have gynecological abnormalities such as ovarian cyst which was not endometriosis, ovarian tumor, and uterine myoma, had no history of thyrotoxicosis, diabetes mellitus, ischemic stroke, and celiac disease which were known from anamnesa, while, the exclusion criteria are damaged blood samples, refused to participate in the study, and the acceptor did not adhere to regular injection schedules. The data would be tabulated by using SPSS then made in the form of frequency distribution table of the study sample by age, and the parity of Univariate statistical analysis. To assess the difference in serum calcium levels between DMPA hormonal contraceptive using and without using. Bivariate statistical analysis was performed using T-test (if the distribution normal) or Mann Whitney (if the distribution not normal) test. This study used a confidence level of 95%.

## III. Result

**Table 4.1.1** The characteristics of Samples based on the Age and BMI.

Characteristics	Age(Years)		P value
<b>Samples</b>	<b>Mean ± SD</b>	<b>Range</b>	
<b>Using DMPA</b>	38,40± 3,244	30 – 44	0,227*
<b>Not using DMPA</b>	37,73± 2,753	29 – 40	
	<b>BMI</b>		<b>P value</b>
<b>Samples</b>	<b>Mean ± SD</b>	<b>Range</b>	
<b>Using DMPA</b>	23,19± 1,67	20,81 - 26,67	0,102**
<b>Not using DMPA</b>	24,06± 2,34	19,53 - 28,57	
<b>The duration of DMPA</b>	2,27± 0,18	2 -2,6	

Table 4.1.1 above, explains that the characteristics of the study subjects by age in the DMPA contraceptive users group in average age of  $38.40 \pm 3.244$  years while in the not using group was in average age of  $37.73 \pm 2.753$  years. Based on BMI, DMPA contraceptive users group has a mean value of BMI of  $23.1913 \pm 1.67$  while in not using group with mean BMI  $24,06 \pm 2,34$ . Statistically both groups by age and BMI did not show a significant difference ( $p > 0.05$ ). The average duration of DMPA contraceptive use was  $2.27 \pm 0.18$  years.

To determine the difference of serum calcium level in women DMPA using and not using were tested statistically with Mann-Whitney test because the data were not normally distributed. The statistical test results are shown in the table below.

**Table 4.1.2** The Difference of Serum Calcium Levels in Women Using DMPA and Not Using DMPA

Subjects	Calcium Levels		P value *
	Mean ± SD	Range	
<b>Using</b>	9,64 ± 1,21	7,90 - 15,50	0,818
<b>Not Using</b>	9,51 ± 0,50	8,60 - 11,20	

\*Mann-Whitney test

Based on table 4.1.2 above, can be seen that the average calcium levels of the study not using DMPA samples is in  $9.64 \pm 1.21$  slightly higher when compared with the DMPA using that is  $9.51 \pm 0.50$ . Statistically, there were no significant differences in calcium levels of non-family research subjects with DMPA ( $p > 0.05$ ).

**Table 4.1.3** Average Calcium Level based on BMI DMPA Users

BMI	N	Kadar Kalsium					Nilai p
		Mean	Std. Deviation	Median	Minimum	Maximum	
Normo-weight	24	9,45	0,40	9,55	8,60	10,00	
Overweight	6	9,73	0,79	9,50	9,00	11,20	0,677
<b>Total</b>	<b>30</b>	<b>9,51</b>	<b>,50168</b>	<b>9,5000</b>	<b>8,60</b>	<b>11,20</b>	

Based on table 4.1.3 above, explained that the average calcium content based on BMI on DMPA users. For normoweight group, the average calcium level is  $9.45 \pm 0.40$  and in the group overweight average calcium level is  $9.73 \pm 0.79$ . The statistic used is Mann-Whitney, according to data was not normally distributed. We got the P value from the statistic above 0.677 which showed no significant difference of calcium DMPA user level based on BMI ( $p > 0,05$ ).

#### IV. Conclusion

Characteristics of DMPA contraceptive users by age and BMI statistically show no significant difference ( $p > 0,05$ ). The average duration of DMPA contraceptive use was  $2.27 \pm 0.18$  years. Statistically, there was no significant difference of non-KB group calcium content with KB DMPA ( $p > 0,05$ ). From statistic test with Mann-Whitney got p value = 0,677 which showed no significant difference of calcium content of DMPA user based on BMI ( $p > 0,05$ ).

#### References

- [1]. Ministry of Health of the Republic of Indonesia. Ministry of Health Strategic Plan 2015-2019: Decree of the Minister of Health of the Republic of Indonesia No. HK.02.02 / MENKES / 52/2015. Ministry of Health RI 2015
- [2]. UNICEF Indonesia. Health of both mother and child. Summary of the 2012 Review
- [3]. Ministry of Health of the Republic of Indonesia. Indonesia Health Profile Year 2013. Kemenkes RI 2014
- [4]. The Millenium Development Goals Report 2013. We Can End Poverty: Millenium Development Goals and Beyond 2015: Fact Sheet. United Nations 2013 Department of Economic and Social Affairs. Trends in Contraceptive Use Worldwide 2015. United Nations New York 2015
- [5]. World Health Organization. Selected Practice Recommendations for Contraceptive Use Third Edition.
- [6]. WHO 2016 DHMK/FHA/CMCH Maryland. Depot Medroxyprogesterone Acetate. Maryland Family Planning & Reproductive Health Program Clinical Guidelines 2012
- [7]. Faculty of Sexual & Reproductive Healthcare. Progestogen Only Injectable Contraception. FSRH 2014
- [8]. National Institute for Health and Care Excellence. Long Acting Reversible Contraception: Subcutaneous Depot Medroxyprogesterone Acetate (DMPA-SC). NICE 2014
- [9]. S, Malarcher., O, Meirik., E, Lebetkin., I, Shah., J, Spieler., J, Stanback. Provision of DMPA by Community Health Workers: What the Evidence Shows. Contraception 2010
- [10]. Singh, P., Vyas, RC., Ushma., Yadav, P. Study of Effectiveness of DMPA in Postpartum and Postabortal Period. IOSR Journal of Dental and Medical Sciences 2015;14(2):74-78
- [11]. The National Women's Health Network. Depo-Provera and Bone Loss: Fact Sheet. NWHN 2015 O. Akinloye, T.O. Adebayo, O.O. Oguntibeju, D.P. Oparinde, dan E.O. Ogunyemi. Effects of Contraceptives on Serum Trace Elements, Calcium and Phosphorus Levels. West Indian Med J 2011; 60 (3): 309
- [12]. Africander, DJ. Comparative Study of the Molecular Mechanism of Action of the Synthetic Progestins, Medroxyprogesterone Acetate, and Norethisterone Acetate. Stellenbosch University 2010
- [13]. Scheller, J., Chalaris, A., Arras, DS., John, SR. The Pro-and Anti-Inflammatory Properties of The Cytokine Interleukin-6. Elsevier 2011:878-888
- [14]. Christine Demers, Christine Derzko, Michèle David, dan Joanne Douglas. Gynaecological and Obstetric Management of Women With Inherited Bleeding Disorders. JOGC JUILLET 2005
- [15]. Eriberto A. Roveri, Gustavo Chapo, Irene Grappiolo, dan Rodolfo C. Puche. Effects Of Depot Medroxyprogesterone Acetate On The Calcium Metabolism Of Adult Ovariectomized Rats. Medicina (Buenos Aires) 2000; 60: 482-486
- [16]. 2006

Henry K D Silaen "Blood Calcium Level on Depo Medroxy Progesterone Acetate (Dmpa) Hormonal Contraception Users For 2 Years". IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 7, no.1 , 2018, pp. 16-18.