

DEPOT MEDROXY PROGESTERONE ASETATE (DMPA) INJECTABLE IN LONG TERM INCREASE CHANGES ON LIPID PROFILES OF DMPA INJECTION CONTRACEPTIVE ACCEPTORS

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ABSTRACT

Introduction: DMPA injectable contraceptives can cause changes in lipoprotein metabolism. Long term use of DMPA increases triglyceride levels, total cholesterol and LDL and decreases HDL levels. So, it can be concluded that DMPA can cause changes in lipid metabolism which can increase the risk of cardiovascular disease. Changes in fat metabolism occur due to the influence of the hormonal progesterone, which causes disruption of the balance of the lipid profile in the body. **Objective:** To determine the effect of using Depo Medroxy Progesterone Acetate injection on the lipid profile of three months injection family planning acceptors based on the duration of use. **Methods:** This research is an analytic observational study with a cross sectional approach, the population in this study were all DMPA sampling technique used was total sampling with a sample size of 30. Examination of the lipid profile was carried out by taking blood samples and then measuring them. lipid profile using the enzymatic colorimetric method (cholesterol oxidase method / CHOD PAP). The measurement results obtained were then analyzed using the Independent T test. **Result:** The T test analysis showed that the P value for cholesterol levels was 0.016 (P <0.05); The p value for triglyceride levels was 0.004 (P <0.05); The p value for HDL levels was 0.046 (P <0.05); The p value for LDL levels was 0.004 (P <0.05). **Conclusion:** From these data it can be concluded that there is a significant difference in the average levels of cholesterol, triglycerides, HDL, LDL between respondents with a duration of use <3 years and >3 years. Respondents are expected to carry out routine lipid profile checks to detect early detection of possible abnormalities in lipid profiles that can lead to the risk of heart defects and stroke.

ABSTRAK

Latar belakang: Kontrasepsi suntik DMPA dapat menyebabkan perubahan pada metabolisme lipoprotein. Penggunaan jangka panjang dari DMPA meningkatkan kadar trigliserida, kolesterol total dan LDL dan menurunkan kadar HDL. Sehingga dapat disimpulkan DMPA dapat menyebabkan perubahan metabolisme lipid yang dapat meningkatkan resiko penyakit kardiovaskular. Perubahan metabolisme lemak terjadi karena adanya pengaruh hormonal progesteron sehingga menyebabkan gangguan keseimbangan profil lipid dalam tubuh. **Tujuan:** Mengetahui pengaruh penggunaan suntik Depo Medroxy Progesterone Acetate terhadap profil lipid pada akseptor KB suntik 3 bulan (DMPA) berdasarkan lama penggunaannya. **Metode:** Penelitian ini merupakan penelitian observasional analitik dengan pendekatan cross sectional, populasi dalam penelitian ini adalah seluruh akseptor KB DMPA di wilayah kerja puskesmas banjar sargon, teknik sampling yang digunakan adalah total sampling dengan jumlah sampel 30. Pemeriksaan profil lipid dilakukan dengan melakukan pengambilan sampel darah kemudian dilakukan pengukuran profil lipid dengan menggunakan metode Kolorimetrik enzimatik (cholesterol oxidase method/CHOD PAP). Hasil pengukuran yang didapat kemudian dianalisis menggunakan Independent T test. **Hasil:** Hasil analisis Uji T didapatkan P value untuk kadar Kolesterol adalah 0,016 (P<0,05); P value untuk kadar Trigliserida adalah 0,004 (P<0,05); P value untuk kadar HDL adalah 0,046 (P<0,05); P value untuk kadar LDL adalah 0,004 (P<0,05). **Kesimpulan:** Dari data tersebut dapat disimpulkan bahwa ada perbedaan secara signifikan rata – rata kadar Kolesterol, Trigliserida, HDL, LDL antara responden dengan lama pemakaian <3 tahun dan >3 tahun. Diharapkan kepada responden untuk selalu melakukan pemeriksaan profil lipid secara rutin untuk deteksi dini kemungkinan terjadinya kelainan pada profil lipid yang dapat menyebabkan resiko terjadi kelainan jantung dan stroke.

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Introduction:

DMPA (*Depot Medroxy Progesterone Asetate*) injectable is one of contraceptive methods widely used because this contraceptive has high effectiveness and failure rarely occurs. Moreover, this contraceptive has a relatively cheap price. So, this can make respondents interested in using it. However, not a few of them understand about the side effects that may occur if the contraceptive is used in the long term.

Data source from the Indonesian Ministry of Health (2018) number of active family planning participants in the year 2017 is 63,22%, while those who never used contraception were 18,63%. If seen based on the pattern in the choice of contraception, most of the participants preferred to use injections and pills as contraceptives (>80%) compared to other methods that is injection (62,77%) and pills (17,24%). (Kemenkes RI, 2018)

Data source from the Family Health Section, number of couples of childbearing age in the Jember Regency in the year 2016 recorded as much 411.230. From the number of, coverage of new KB participants is 38.114 (9,3%) and active family planning participants reach 353.403 (85,9%). Meanwhile, coverage of family planning participants according to the type of contraception used in the year 2016 the highest percentage of contraceptive use by participants was injection contraceptive at 51,6 % and the least used contraceptives are MOP (1,1 %), Vaginal Medicine (1,1 %) and MOW (1,2 %). (Profil kesehatan kabupaten jember, 2017)

DMPA injectable contraceptives can cause changes in lipoprotein metabolism, increase in body mass is due to different fat profiles under normal circumstances, DMPA will increase serum fat so that it will have an impact on weight gain (Bakry & Abdullah, 2009). Research on the effect of using hormonal contraceptives on weight gain shows that injection contraceptive use significantly increases the risk of weight gain (Ambarwati & Sukarsi, 2012).

Source (Yadav et al., 2011), in his study of the effect of longterm use of DMPA

on lipid metabolism in 60 women in Nepal who had used it for more than two years demonstrated that triglyceride levels, total cholesterol and Low Density Lipoprotein (LDL) higher than non acceptors, while the levels of High Density Lipoprotein (HDL) decreased. So, It can be concluded that DMPA can cause changes in lipid metabolism which can increase the risk of cardiovascular disease. Changes in fat metabolism occur due to the influence of the hormonal progesterone, causing disruption of the balance of the lipid profile in the body.

Changes in serum lipid profiles (triglycerides, total cholesterol, HDL and LDL) in long-term use of DMPA are a risk factor for atherosclerosis (fat accumulation in artery walls) and cardiovascular disease. Increased levels of triglycerides, total cholesterol, LDL and decreased HDL and increased excess body weight are the diagnostic criteria for metabolic syndrome which can increase the incidence of diabetes mellitus type II and cardiovascular. Therefore, lipid profile is the best predictor of metabolic syndrome.

The purpose of this study was to determine the effect of the use of Depo Medroxy Progesterone Acetate injection on the lipid profile of three month injection family planning (DMPA) acceptors.

Methods:

This type of research is an analytic observational study with a cross sectional approach. The population in this study were all three month injection family planning (DMPA) acceptors at Posyandu Alamanda, Jumerto Village in the Banjar Sengon Health Center, Jember Regency. Number of samples is 30 respondents had met the inclusion and exclusion criteria.

Before conducting the research, this study has received approval from the ethical clearance of STIKES dr. Soebandi Jember No.54/SDS/KEPK/TL/VI/2020. Data collection process was carried out by taking a sample of the respondent's blood and then measuring the lipid profile using the

enzymatic colorimetric method (CHOD PAP). The results of the sampling were then analyzed using SPSS using the independent T test.

Results:

The following will present the results of research on the lipid profile of DMPA injection contraceptive acceptors with a duration of use <3 years and > 3 years.

Table 1. The frequency distribution of the study sample group based on the duration of use

No	Duration of contraceptive usage	Number of	Frequency (%)
1	<3 years	15	50
2	>3 years	15	50
Total		30	100

From Table 1 above, it is known that the number of sample groups in this study is the same as between the groups of respondents with the use of DMPA injection contraceptives <3 years and with > 3 years usage, namely each group of 15 respondents.

Table 2. Average Cholesterol levels at DMPA injection KB acceptors are based on the length of time they are used

Group	Mean	SD	P value
<3 year	151,3333	17,95099	0,016
>3 year	184,8	47,17778	

Based on Table 2 above, it is known that the average value of cholesterol (Mean) for the <3 years group is 151.3333 and the > 3 years group is 184.8. Meanwhile, the T test results obtained P value 0.016 (P <0.05) this means that there is a significant difference in the average Cholesterol levels between the 2 groups.

Table 3. Average levels of triglycerides at DMPA injection KB acceptors were based on the length of time they were used

Group	Mean	SD	P value
<3 year	66,5333	17,10416	0,004

>3 year	96,4	32,96275
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Based on Table 3 above, it is known that the average value of Triglyceride levels (Mean) for the <3 years group is 66.5333 and the > 3 years group is 96.4. While the T test results obtained P value 0.004 (P <0.05), which means that there is a significant difference in the average Triglyceride levels between the 2 groups.

Table 4. The average HDL levels in DMPA injection KB acceptors were based on the duration of use

Group	Mean	SD	P value
<3 year	50	9,05539	0,046
>3 year	43,2667	8,5979	

Based on Table 4 above, it is known that the average HDL level (Mean) for the <3 years group is 50 and the >3 years group is 43.2667. While the T test results obtained P value 0.046 (P <0.05), which means that there is a significant difference in the average HDL levels between the 2 groups.

Table 5. The average LDL level in DMPA injection KB acceptors was based on the duration

Group	Mean	SD	P value
<3 year	99,6667	22,86503	0,004
>3 year	129,3333	28,52234	

Based on Table 5 above, it is known that the average LDL value (Mean) for the <3 years group is 99.6667 and the >3 years group is 129.3333. While the T test results obtained P value 0.004 (P <0.05), which means there is a significant difference in the average LDL levels between the 2 groups.

Discussion:

DMPA (Depot Medroxy Progesterone Asetate) injection or commonly known as three months birth control injection is the most popular method of contraception by women who want to sparse their pregnancies.

However, most of them still do not understand about the side effects that occur if used in the long term. They still feel comfortable with using these contraceptives at the same time being used in the long term because of their high effectiveness and relatively cheap and affordable prices. Meanwhile, from the results of research conducted by (Prasetyorini et al., 2021) which states that the longer the use of three month injection contraception can increase total cholesterol levels because in three month injection contraception there is a progesterone hormone which can affect fat metabolism, especially lipoproteins. Changes in lipid metabolism that occur due to hormonal influences, causing disruption of the development of the lipid profile in the body.

In this study, the researchers also saw a significant change in the lipid profile of DMPA injection KB acceptors with a duration of use > 3 years. The lipid profiles examined in this study included total cholesterol, HDL, LDL and triglyceride levels. From the research results, it is known that the average HDL level (Mean) for the <3 years group is 50 and the >3 years group is 43,2667. Meanwhile, for LDL levels it is known that the mean value for the <3 years group is 99.6667 and the > 3 years group is 129.3333. From these results we can conclude that long term use of DMPA injection can reduce average HDL levels and increase average LDL levels. This is also in line with the results of research conducted by (Sitinjak et al., 2019) which states that 3 months of injection contraception in the long term will cause some side effects because contraception contains the hormone progesterone which can reduce HDL cholesterol levels (good cholesterol) and increase LDL levels. cholesterol (bad cholesterol) in the blood which can increase cholesterol levels.

Low Density Lipoprotein (LDL) or commonly known as bad cholesterol is a type of cholesterol that can cause bad effects on the body if the levels are too high. This is due to the atherogenic properties of LDL. Meanwhile, High Density Lipoprotein (HDL) is often called good cholesterol because it is a

lipoprotein that transports lipids from the periphery to the liver. HDL can pass through vascular endothelial cells that enter the intima to transport back cholesterol collected in macrophages, besides that HDL also has antioxidant properties so it can prevent LDL oxidation (Anggraeni, 2016). Therefore, the balance between HDL and LDL is needed to avoid accumulation of cholesterol in the blood vessels which can increase the risk of heart disease and stroke.

Research results obtained by the researchers showed that long-term injection of DMPA (> 3 years) can increase the risk of heart disease and stroke because long-term DMPA injection can reduce HDL levels and increase LDL levels in the blood. The same thing was also stated by (Yadav et al., 2011), namely the use of DMPA injection for more than 2 years showed a change in triglyceride levels, total cholesterol and higher Low Density Lipoprotein (LDL) when compared to non acceptors, while the levels of High Density Lipoprotein (HDL) decreased. Any change in the lipid profile can increase the risk of heart disease and stroke. Changes in fat metabolism occur due to the influence of the hormonal progesterone, which causes disruption of the balance of the lipid profile in the body.

Long term DMPA injection also caused significant changes in the levels of triglycerides and cholesterol in the blood of DMPA injection KB acceptors >3 years. From the results of the study, it was found that the average cholesterol (Mean) for the group of respondents with usage <3 years was 151.3333 and the group > 3 years was 184.8. And the average Triglyceride levels (Mean) for the <3 years group was 66.5333 and the > 3 years group was 96.4. This is also explained by (Elfrida et al., 2020) which states that there is a correlation between the length of time using DMPA injection contraceptives with cholesterol levels in the use of DMPA injection contraceptives for ≥ 36 months. (Yadav et al., 2011) also states that one of the side effects or disadvantages of using DMPA injection contraceptive is a change in serum

lipids where cholesterol levels increase in long term use. The effect of DMPA on the cardiovascular system is a slight increase in insulin levels and a decrease in HDL cholesterol.

(Samiasih & Hartiti, 2014) research stated that the longer the use of DMPA injection contraception, it can increase triglyceride levels in the blood. Triglycerides play a role in risk factors for atherosclerosis and coronary heart disease (CHD) when accompanied by a decrease in HDL levels. The results of research conducted by researchers showed that there was a decrease in HDL levels in the blood and an increase in the levels of triglycerides in the blood. From these findings, the researchers concluded that an increase in triglyceride levels in the blood can also increase the risk of heart disease in the 3 months injection family planning acceptors with use of > 3 years.

Many experts argue that the use of DMPA does not cause changes in lipid metabolism, but many studies have found changes in serum lipid profiles (total cholesterol, HDL, LDL, triglycerides) on long-term use of DMPA. In a study conducted by (Samiasih & Hartiti, 2014) on the effect of DMPA on triglyceride levels, it shows an increase in the average triglyceride level 6 months after DMPA administration. In this case, DMPA injection acts as a chemical which in long-term use is able to suppress estrogen levels in the body. DMPA in the blood is able to inhibit positive feedback from estradiol at the hypothalamus-pituitary access, so that the estradiol level remains in the early follicular phase. Estradiol levels are relatively high in the body of women before menopause. Estrogen is thought to provide protection against the incidence of heart disease. Many studies have shown that estrogen can slow the process of atherosclerosis and reduce the risk of coronary heart disease. Meanwhile, DMPA has an impact on reducing estrogen levels, thereby stimulating the occurrence of coronary heart disease (Samiasih & Hartiti, 2014).

Conclusion:

From the results of this study, the results of the independent t test data analysis showed that the P value <0.05 for the results of checking the lipid profile (HDL, LDL, Triglycerides, Cholesterol), which means that there is a significant difference in changes in the lipid profile of DMPA injection family planning acceptors with a long time usage <3 years and >3 years. Respondents are expected to carry out routine lipid profile checks to detect early detection of possible abnormalities in lipid profiles that can lead to the risk of heart defects and stroke.

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