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Research

Lipid Profile (Total Cholesterol, LDL, HDL, Triglyceride) of Injection Contraceptive Acceptors in Semarang

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ABSTRACT

Background: Hormonal injectable contraceptives are the most common choice taken by women. The 3-month injection of contraception is DMPA, one of the most effective contraceptive methods currently used. Using injectable contraceptives, especially DMPA, influences fat metabolism, especially lipoproteins. Changes in fat metabolism cause disturbances in the balance of blood fat fractions (fluctuation of HDL, LDL and total cholesterol levels) due to hormonal influences.
Subjects and Method: Descriptive with an observational design study. Seventy-three women accepted injection contraceptive three months with a usage period of more than three years recorded in the Tlogosari Kulon Community Health Center. They were selected based on sample criteria, including inclusion criteria and exclusion criteria, where these criteria determine whether or not the sample can be used. The dependent was lipid profile (cholesterol, trigliceryd, LDL, HDL). The independent variables was contraceptive injections three months. There are seventy-three respondents.
Results: The respondents in this study had 3-month injection contraceptive use of were less than the same as six years of use, namely 41 people, while for use more than the same as seven years there were 32 people and show that most of the research respondents had a lipid profile that was still within normal limits. For the cholesterol levels, 23% is normal, and 76% is abnormal, Trigliceryd level 66% is normal, and 34 % is abnormal. LDL levels 100% is normal, and for the HDL levels, 63% is normal, and 37% is abnormal.
Conclusion: Most of the lipid profiles of respondents were normal. However, on cholesterol levels, respondents had more abnormal levels than normal, but for other lipid profiles (Trigliceryd, LDL, HDL), most respondents had normal levels.

Keywords: lipid profile, injection contraception, DMPA.

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BACKGROUND

Based on the data from the Central Statistics Agency of Semarang in Figures 2018, mentioned that there are 263 373, the number of pairs of childbearing age and become active participants KB. The highest number of fertile age couples was in Pedurungan District, namely 33,236 and one of the contraceptive types is the injection contraceptive type which ranks first with the most acceptors in Semarang City in 2017, namely in Pedurungan District with 13,563 injectable contraceptive acceptors. The village with the

most injection family planning acceptors is Tlogosari Kulon, totalling 2,678 (BPS, 2018).

According to Muniroh (2018), from 26 respondents, it was found that an average level of 150 mg/dL (Mean= 150; SD= 40) with the highest cholesterol level was 305 mg/dl in birth control pill contraceptive respondents. Meanwhile, according to other research, LDL cholesterol levels in injectable contraceptive acceptors for three months with a duration of use <2 years were 46.1% average results and on use >2 years amounted to 53.9%, the results increased. Based on this description, the authors will research "Lipid Profiles on Injectable Contraceptive Acceptors".

SUBJECTS AND METHOD

1. Study Design

The research design used in this study was an observational study with a cross-sectional approach. The study period was from July to October 2020. The research was conducted at the Tlogosari Kulon Community Health Center.

2. Population and Sample

This study's population was the 3-month injection contraceptive acceptors recorded at the Tlogosari Kulon Community Health Center. Samples taken in this study were 73 injection contraceptive acceptors for three months with a usage period of more than three years which were recorded in the Tlogosari Kulon Health Center and were selected based on sample criteria including inclusion criteria and exclusion criteria, where these criteria determine whether or not the sample can be used.

3. Study Variables

The dependent variables of this study was lipid profile. The independent variable was contraceptive injections three months.

4. Operational Definition of Variables

Cholesterol Levels were the results of checking cholesterol levels at three months injection contraceptive acceptors measured using the CHOD-PAP method with a spectrophotometer with mg/dl unit results and a nominal scale.

HDL levels were the results of examining HDL cholesterol levels at three months injection contraceptive acceptors measured using the CHOD - PAP method with a spectrophotometer with mg/dl unit results and a nominal scale.

LDL levels are the results of checking LDL cholesterol levels at three months injection contraceptive acceptors measured using the Friedelwald calculation method with a spectrophotometer with mg/dl unit results and a nominal scale.

Triglyceride levels are the results of examining triglyceride levels at three months injection contraceptive acceptors measured using the GPO-PAP method with a spectrophotometer with mg/dl yield units a nominal scale.

DMPA injection contraception or three months is a 3-month injection contraceptive acceptor with the hormone progesterone's content and the duration of use ≥ three years.

5. Study Instruments

Each lipid profile was measured using a spectrophotometer. statistical analysis was using SSPS 25 version

6. Data analysis

Univariate analysis was used to describe each dependent and independent variable. The data is then grouped according to the type of data and entered into a frequency distribution table. Bivariate analysis is used to determine the correlation between independent variables and the dependent variable using the non-parametric test of Pearson and Kendal tau.

7. Research Ethics

This study was conducted based on the study ethics, which consisted of an informed consent form, anonymity, confidentiality by giving a code to each respondent. The

research ethics was obtained by the Semarang Health Polytechnic Ethics Commission at number 053/IX/KNEPK/ED/2020.

RESULTS

1. Sample Characteristics

Seventy-three women accepted injection contraceptive three months with a usage period of more than three years recorded in the Tlogosari Kulon Community Health Center. They were selected based on sample criteria, including inclusion criteria and exclusion criteria, where these criteria determine whether or not the sample can be used.

Table 1. Sample characteristics

Characteristics	Category	Frequency (N)	Percentage
Age	≤ 36 year old	36	49.3 %
	≥ 37 years old	37	50.7 %
Duration of use	≤Six years	41	43.8%
	≥Seven years	32	56.2%

Based on Table 1, most respondents in this study were aged less than 36 years, namely 36 people, while for those aged over 37 years, there were 37 people. Moreover, it shows that most of the 3-month injection contraceptive use of respondents in this study was less than the same as six years of use, namely 41 people, while for use more than the same as seven years there were 32 people. Sample characteristics of continuous data were described in Table 2.

Table 2. Sample characteristics

Variables	Mean	SD	Min.	Max.
Age	37.22	5.11	29	50
Cholesterol	233.09	46.49	139	364
Triglyceride	130.04	59.512	54	505
LDL	38.33	1.05	20	92
HDL	42.95	1.13	15	60.2

2. Bivariate Analysis

Table 3. Bivariate analysis of the relation of contraceptive duration and age on lipid profiles

Variable		r	p
Independent	Dependent		
Duration	CHOL	0.317	0.001
	TG	No Relation	0.505
	LDL	No Relation	0.776
	HDL	No Relation	0.979
Age	CHOL	0.004	0.333
	TG	No Relation	0.967
	LDL	No Relation	0.785
	HDL	No Relation	0.733

For the correlation test results between the duration of contraceptive use and cholesterol, sig was found to be 0.001, which means that there is a relationship between the respondent's age and cholesterol levels. As for the correlation coefficient (r), the results obtained

were 0.317, which according to the guidelines for the degree of relationship, was categorized as sufficient correlation and had a significant relationship at the 0.01 significance level or what it meant was that it had an error rate of 1%. For triglyceride levels, the result was p= 0.505, which means that there is no relationship between the duration of contraceptive use and triglyceride levels. There is no relationship between the duration of contraceptive use and LDL levels. HDL levels obtained p= 0.979, which means no relationship between the duration of contraceptive use and HDL levels. The relationship between the respondent's age and the cholesterol level (p= 0.004), which means there is a relationship between the age of the respondent and the cholesterol level.

Meanwhile, for the Pearson correlation (r), the results obtained were 0.333, which according to the guidelines for the degree of the relationship, was in the weak correlation category and had a significant relationship at the 0.01 significance level or what it meant was that it had an error rate of 1%. The relationship between the respondent's age and the triglyceride status and the sig was 0.967, which means that there is no relationship between the respondent's age and the triglyceride status. There is a relationship between the respondent's age and the LDL level, and the sig result is 0.785, which means that there is no relationship between the respondent's age and the LDL level. The relationship between the respondent's age with HDL status (p= 0.733), which means that there is no relationship between the age of the respondent and the HDL status.

DISCUSSION

The majority of respondents in this study were aged less than 36 years, namely 36 people, while for those aged over 37 years there were 37 people. The research respondents' age ranged from 30-40 years, which is the productive age because they have not experienced menopause. In this age range, the contraceptive acceptors reduce the birth rate. The period of age 20-35 years is a period of spacing of pregnancies for which a contraceptive method is needed which is quite adequate, long term (2-4 years) and reversible. The appropriate contraceptive priorities are IUD, injection, mini pill, pill, simple method, Norplant (AKBK) and Kontap (Prawirohardjo, 2016). In contrast to the type of contraception used by mothers who are more than 35 years old. At this age, it is the phase of terminating pregnancy so that contraception with higher criteria is needed, namely very high effectiveness and does not add to existing disorders/diseases (Prawirohardjo, 2016).

It shows that most of the 3-month injection contraceptive use of respondents in this study was less than the same as six years of use. The effect of long-term use of injectable contraceptives on lipid metabolism after two years of use indicates that total cholesterol levels are higher. With this, it can be concluded that injection contraception can cause lipid metabolism changes, increasing cardiovascular disease risk (heart disease) (Yadav *et al.*, 2011). Besides, there is a relationship between the length of time using injection contraceptives and the respondents' body weight. The use of injectable contraceptives can affect the weight gain that occurs between the ages of 20-35 years (Rohmatin, 2015). This increase in the body affects total cholesterol because the fat stored under the skin increases (Rahmawati, 2011).

Rahayu and Wijanarko (2017) found that DMPA injection contraceptives with a prolonged use after two years were menstrual disorders in the form of amenorrhea, vaginal discharge, and weight gain. According to Mayulu, the use of hormonal contraceptives can cause various side effects, one of which is the acceptors' body weight. This is due to the

progesterone hormone, which makes it easier to convert carbohydrates and sugars into fat, so that the fat under the skin tissue increases in depth (Novalia, 2015).

Wulandari and Surati (2019) reported that there is an effect that the use of DMPA contraception has on changes in body weight. Of the 25 respondents observed, 20 respondents experienced body weight changes, and five did not experience body weight changes. These results further strengthen the linkage of use of DMPA contraceptives to changes in body weight. This weight gain indicates an unbalanced metabolism between the number of calories that the body enters and expends (Prihati et al., 2019).

The result showed that most of the research respondents had a lipid profile that was still within normal limits. It has a standard value below 200 mg/dl, and it was found that 56 respondents were above the standard limit or > 200 mg/dl while 17 other respondents had normal cholesterol levels. Triglycerides have average values below 150 mg/dl, and it was found that 43 respondents had triglyceride levels that were still within normal limits, while 25 others had abnormal values or were >150 mg/dl. Whereas for the LDL value, it was found that all 73 respondents had normal triglyceride values, which were within the limit of less than 100 mg/dl, then for the HDL lipid profile in this study, 46 respondents had normal HDL levels, namely less than 40 mg/dl while 27 other respondents had abnormal LDL levels or were above 40 mg/dl.

Al-Youzbaki (2011) stated that there is no significant difference in LDL levels between DMPA and non-DMPA users. LDL cholesterol itself is a lipoprotein which is responsible for carrying serum cholesterol into blood vessel cells. Statistically, it shows no significant difference between the two groups; this is that several factors affect LDL levels, including hormones, food intake and dietary patterns. Fertile women who use hormonal contraceptives cause the hormones estrogen and progesterone imbalance, resulting in decreased HDL and increased LDL. Decreasing HDL in DMPA contraceptive users causes LDL levels to increase. That is because HDL's function is to break down triglycerides and LDL to be re-synthesized in the liver, thereby reducing the attachment of plaque in blood vessel walls (Menazza and Murphy, 2016).

Increased LDL and decreased HDL have a significant effect on increasing total cholesterol levels (Murray, 2014). This causes combined contraceptive users to have relatively stable cholesterol levels compared to DMPA contraception due to combined contraceptives containing Ethynil Estradiol that balances the hormonal level in the body (Astuti et al., 2018). According to the research in Harar regarding the risk of dyslipidemia in hormonal contraception acceptors shows that in the contraceptive injection acceptors with a duration of 6-42 months, it was found that 33% of acceptors were diagnosed with dyslipidemia. The length of use of contraception also influences it. In the users with a duration of >42 months, there are 75% of users identified as dyslipidemia (Sufa et al., 2019).

AUTHOR CONTRIBUTION

Surati processed the data and Djoko Priyatno compiled and reviewed this article.

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CONFLICT OF INTEREST

There is no conflict of interest in this study.

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