The Differences Between Hormonal Pills and Injection Contraception Adverse Effect: Pekanbaru Puskesmas Case Study

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A B S T R A C T

Background: In Indonesia majority contraception participant using hormonal methods, consist of pills and injection methods. Whereas, hormonal contraception methods causing various adverse effects. Menstrual cycle irregularity, metrorhagia, menorhagia, nausea, headache, breast tenderness, weight gain, negative mood changes, libido changes, acne, palpitation, hair loss

Objectives: To acknowledge the adverse effect differences between pills and injections hormonal contraception

Methodology: The design of this study is cross sectional, using sample from Puskesmas in Pekanbaru. Data was analyze with cross tabulation, and Independent T-test.

Results: Adverse effect that have been found according to its quantities: weight gain (74%), Menstrual cycle irregularity (53%) , mood changes (53%), libido changes (47%), hair loss (47%), headache (24%), nausea (21%), acne (21%), metrorhagia (21%), menorhagia (18%) palpitation (6%). Cross tabulation show that most adverse effect was found on injection hormonal contraception

Discussions: Hormonal contraception adverse effect commonly explained by its effect on metabolic and cardiovascular system. Metabolically, hormonal contraception affecting many target organs with progestin as mostly substance in charge as cause for adverse effect

Conclusions: There is significant differences adverse effect between hormonal injections progestin only contraception methods and hormonal pills estradiol levonorgestrel combination. All adverse effect occur more excessively (18%) on hormonal injection progestin only methods
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Keywords: Hormonal Pills, Injection, Contraception progestin-only method

1. INTRODUCTION

Family Planning Program is held by using contraception methods, which is categorized to long term and short term methods[1,2]. From BKKBN January 2018 report, there is 86,3% short term method, 53,43% is injection users, 22,32% is pills user, and 10,55% is intrauterine device users[1]. Injections and pills methods are using hormonal substance. Hormonal contraception method has many adverse effects. These adverse effects classified by its impact on user's quality of life, as is light, moderate, and severe adverse effect[3]. Generally, hormonal contraception adverse effect explained by its hormonal substance effect on metabolic and cardiovascular system. Metabolically, hormone substance affecting associate endocrine organs, and most adverse effects is caused by it[4]. Adverse effect commonly found

on hormonal method users is light adverse effects, such as: menstrual cycle irregularity, metrorhagia, menorhagia, nausea, headache, breast tenderness, weight gain, negative mood changes, libido changes, acne, palpitation, hair loss, rising blood pressure. This research aim is to acknowledge the adverse effect differences between pills and injections methods. In the future, this research result could be used as a part of contraception counseling or as a baseline for future research.

2. MATERIALS AND RESEARCH METHOD

This study using cross sectional design, accidental sampling technique. Sample acquired from injection and pills contraception user in 3 Puskesmas in Pekanbaru area: Puskesmas Simpang Tiga, Karya Wanita, and Sidomulyo. Hormonal injection contain medroxyprogesterone, and pills contain ethinylestradiol and levonergestrel. By using accidental sampling for 2 weeks, with 34 sample, 25 injection users, and 9 pills users. Data collected through calculating the obtained proportion of each adverse effects for each injection users and pills users. These proportions then analyzed using cross tabulation, and Independent T-test.

3. RESEARCH RESULT

There are 34 sample, 25 injection users (73,5%), and 9 pills users (26,5%). Overall, most adverse effect found for both injection and pills users is weight gain (74%). Next, there are menstruation cycle disorders (53%) and negative mood changes (53%).

Table 1. Cross Tabulation for Hormonal Injection and Pills Contraception Users Adverse effects

Adverse Effect	Injection		Pills		Total	%
	N	%	N	%	N	%
Polymenorrhea	6	18%	1	3%	7	21%
Oligomenorrhea	13	38%	5	15%	18	53%
Irregular cycle	17	50%	1	3%	18	53%
Menorrhagia	4	12%	2	6%	6	18%
Metrorhagia	6	18%	1	3%	7	21%
Nausea	5	15%	2	6%	7	21%
Headache	6	18%	2	6%	8	24%
Breast tenderness	6	18%	1	3%	7	21%
Weight gain	18	53%	7	21%	25	74%
Acne	6	18%	1	3%	7	21%
Negative mood changes	14	41%	4	12%	18	53%
Libido changes	13	38%	3	9%	16	47%
Hairloss	10	29%	6	18%	16	47%
Rising blood pressure	4	12%	1	3%	5	15%
Palpitation	2	6%	0	0%	2	6%
Others	7	21%	1	3%	8	24%

Based on Independent T test result, there are significant adverse effect differences between hormonal injection and pills contraception (p value 0,000), with mean differences between methods 0.1818 or hormonal injection adverse effect 18% more than hormonal pills adverse effect

Table 2. Independent T test results for Hormonal Injection and Pills Contraception Users Adverse effects

Contraception Method	N	Mean	Std. Deviation	Std. Error Mean	t	Sig (2-tailed)	Mean Difference
Injection	16	.2531	.14323	.03581	4.663	.000	.18188
Pills	16	.0713	.06185	.01546			

4. DISCUSSION

Hormonal contraception adverse effect differences could be explained by differences hormones, there are causing different effect. Despite their biochemical differences, clinically most adverse effect more likely to happened on those progestin only users [5,6] .This phenomena could be explained by antagonist effect between exogenous estrogen and progesterone on production and synthesis of sex hormone-binding globulin. Exogenous estrogen increases production of sex hormone–binding globulin, while progestin bind sex hormone–binding globulin and decrease its synthesis to varying degrees, which result in different levels of androgenicity [5,6]. On this research, hormonal injection contains progestin only, while hormonal pills contains combination of estradiol and progestin.

Weight gain is caused by estrogenic effect on fluid retention and body fat deposition [3,4,5,6.] Even though weight gain is number one adverse effect found in hormonal injection and pills, but it is counted at different quantities, whereas weight gain in hormonal injection users is 53%, there is only 24% in hormonal pills users. Hence, there is significant difference for weight gain. 22 studies shows that hormonal pills users less likely to had weight gain adverse effect than hormonal injection users [5,6.]

Menstrual cycle disorders is caused by progestin effect on suppressing endometrium growth[3,4]. Menstrual cycle disorders could be in form of oligomenorrhea: shortened duration, lengthened cycle; or polymenorrhea: lengthened duration, shortened cycle, and irregular cycle[3,4,5,6]. This study does not include amenorrhea, because sample inclusion minimum 3 months use of contraception methods, and past 3 menstrual cycle whereas amenorrhea diagnosis needed longer duration and more menstrual cycle. Results shows that oligomenorrhea and irregular cycle happened most on both hormonal injections and pills users. Again, as weight gain has, oligomenorrhea among hormonal injections users is higher (38%) than hormonal pills user (15%). Same result found on irregular cycle, hormonal injection users account for 50% irregular cycle, while hormonal pills users only 3%. Previous study also found same results, where irregular cycle, metrorrhagia, menorrhagia were most likely found on those hormonal injection users [5].

Negative mood changes related to progesterone and progestagen effect on triggering GABA receptor activation[3,4]. This explained the negative mood changes were found higher on hormonal injection user (41%) than on hormonal pills user (12%). Previous study shows that progestin only/hormonal injection users show slightly increased rate of depression. Hence clinically foundings, a prospective study found there is no association between hormonal injection and pills with depressive symptomps.

Libido changes related to progestine effect on vaginal glands dryness. On the other side, estrogene and progesterone combination causing negative feedback on testosterone level[3,4,6.]. Theoretically, testosterone level associated closely to libido changes than vaginal glands dryness. Thus, pills users were most likely to have changes on libido. Despite the theory, results shows there are 38% libido changes among hormonal injection users, and 9% among hormonal pills users. Findings from studies of the sexual effects of hormonal contraceptives have been inconsistent. Theeoretically, bioavailable testosterone is lower in women who use combined oral contraceptives than in nonusers; however, one review found

that women who use these contraceptives show more interest in erotic images [5,6] . Sexual function depends on many factors, other causes of sexual dysfunction should be considered before declaring hormonal contraception as the cause [5,6].

Breast tenderness caused by ductal and lobule of mammary gland proliferation caused by estrogene level[4,6]. 18% of hormonal injection users had breast tenderness, while only 3% pills users had. Previous study state that breast tenderness is more likely to found on those using estrogen than progestin and combination between [5.]

Progesterone affected epidermis and dermis biochemistry, sebum glands composition, vascularization, and hair growth. Hence, it could cause the acne vulgaris and hairloss[3,4,6]. As well as other adverse effect, acne vulgaris and hairloss mostly found on hormonal injection users (18% for acne, 29% for hairloss) than on hormonal pills (3% for acne, 18% for hair loss). Various studies also found same results, where acne and hair loss happened mostly on progestin only methods [5,6].

5. CONCLUSIONS and RECOMMENDATION

There is significant differences adverse effect between hormonal injections progestin only contraception methods and hormonal pills estradiol levonorgestrel combination. All adverse effect occur more excessively (18%) on hormonal injection progestin only methods.

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