

Efficiency and Safety of Different Types of Contraceptive and Its Side Effects: Systematic Review

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Abstract: The oral contraceptive pill, was presented in the beginning of the 1960s and the significance of this invention may not be overstated. For the very first time in history, the woman herself had the possibility to control her own fertility. We aimed by this systematic review study to evaluate the safety and effectiveness of most used contraceptives, moreover we attend to discuss the side effects of each type of contraceptives by reviewing the literature and including studies concerning the same topic. We performed electronic search through, MEDLINE, PubMed, Google Scholar, and EBSCO, for all published articles up to November 2016, we limited our search English studies only, only human trails were included. Constant OCPs are a safe and reputable form of birth control. The metabolic, hormonal, and endometrial results are comparable in constant and cyclic OCP users. The most frequently reported side effect of continuous OCP dosing is irregular vaginal bleeding, however the incidence of this reduces gradually and most patients will get amenorrhea after 1 year of treatment. Constant OCP dosing has proven effective in females with menstrual signs and dysmenorrhea, although larger randomized studies are suggested. Patient fulfillment with both cyclic and constant OCP use is high.

Keywords: cyclic OCP, PubMed, Google Scholar, and EBSCO, Contraceptive and its side effects.

1. INTRODUCTION

The oral contraceptive pill, was presented in the beginning of the 1960s and the significance of this invention may not be overstated. For the very first time in history, the woman herself had the possibility to control her own fertility ⁽¹⁾.

The combined oral contraceptive pill (COC) was found more or less by accident. Throughout the first human trial, in Puerto Rico in 1956, the initial progestin items were contaminated with mestranol, a synthetic estrogen. When the products were cleansed and the estrogen content was decreased, the result was breakthrough bleeding and it was chosen to keep the estrogen for cycle control thus developing the principle of the combined estrogen-- progestin contraceptive pill ⁽²⁾.

Other type of contraceptives which is contraceptives devices such intrauterine releasing hormone and the positioning of contraceptive devices in the uterus for the function of avoiding pregnancy was first described in the scientific literature in the early 1900s. The initial intrauterine devices (IUDs) were made up of contraceptive rings constructed out of a variety of materials, varying from steel to silkworm gut ^(3,4,5,6).

Rapidly after the intro of the pill, a huge variety of women became users; nevertheless, in time a number of health concerns ended up being obvious, but there was also evidence of additional health advantages. Presently, around the world about 100 million women are current users of combined hormonal contraceptives, a lot of regularly utilized in the western world ⁽⁷⁾.

Integrated oral contraceptive pills include an estrogen part, usually ethinyl estradiol, and a progestin part which will vary. Estrogens are known to decrease sebum production. They are assumed to accomplish this in numerous methods, both in your area at the level of the sebaceous gland, and systemically (8). They may directly oppose androgens at the regional level and control genes involved in sebum production and sebaceous gland growth (8). Second, they supply unfavorable feedback on the pituitary/hypothalamus. That is, they prevent the anterior pituitary's production of luteinizing hormonal agent (LH) and follicle-stimulating hormonal agent (FSH), hence decreasing ovarian production of the androgen, testosterone. Third, estrogen administration increases sex hormonal agent binding globulin, which binds serum testosterone, reducing the amount of free testosterone readily available to bind with the androgen receptor (8).

We aimed by this systematic review study to evaluate the safety and effectiveness of most used contraceptives, moreover we attend to discuss the side effects of each type of contraceptives by reviewing the literature and including studies concerning the same topic.

2. METHODOLOGY

Study design:

Systematic review study was conducted according to the international guideline of reviews.

Search strategy:

We performed electronic search through, MEDLINE, PubMed, Google Scholar, and EBSCO, for all published articles up to November 2016, we limited our search English studies only, only human trails were included, we also designed an inclusion criterion for our search which determine the studies that have to be included, and most important among those criteria is all studies discussing the safety and effectiveness and side effects of any type of contraceptives used for humans, we conducted this search strategy through Mesh terms in each database which are: contraceptive, OR oral contraceptives , OR intrauterine contraceptives, OR hormonal contraceptives, Combined with search terms: side effects, AND efficiency , AND effectiveness, AND safety of use. Then Authors investigate each study manually for matching of criteria, we also search particular studies references for similar article concerning any of mentioned aims of this study.

3. RESULTS AND DISCUSSION

Mechanism of Action:

The main contraceptive mechanism of the combination OCP is to prevent ovulation by hindering gonadotropin secretion at both the level of the pituitary gland and the hypothalamus. The estrogen component of OCPs directly hinders follicle-stimulating hormonal agent (FSH) secretion and hence restricts the development of the dominant ovulatory hair follicle. The progestin part of the OCP profoundly reduces luteinizing hormonal agent (LH) secretion and therefore dependably avoids the LH surge which triggers ovulation (9).

In a typically menstruating female who is not taking contraceptive hormones, progesterone is just present in considerable quantities during the luteal phase of the menstrual cycle, after the development of the endometrium. When combination OCPs are administered, the effect of the progestational agent takes precedence over the estrogen part in the reproductive tract, and the endometrium shows this progestin result (10). The outcome is a thin, decidualized endometrium with atrophied glands that is not receptive to embryo implantation. Progestins likewise cause thick, impermeable cervical mucus, avoiding sperm from reaching the uterine cavity, and reduces tubal movement, altering the movement of sperm and oocytes through the fallopian tube (11,12).

Effectiveness and safety of Oral Contraceptive Pills:

Although progestin alone is an effective contraceptive, there are benefits when estrogen and progestin are integrated in an OCP. By straight hindering FSH, estrogen contributes to the contraceptive efficacy of the OCP by restricting follicular advancement. In the endometrium, estrogen stimulation provides stability and may reduce irregular development bleeding seen with progestin only contraceptives (13). Estrogen also potentiates the action of progestational representatives, most likely by increasing the concentration of intracellular progestin receptors (14). This latter effect might decrease the progesterone dose needed in the combined OCP.

We consisted of one study (15) that revealed there are several essential safety concerns and interactions to think about when starting a patient on contraceptive pills. More major negative events may happen in specific patients and should

hence be prevented in those at risk (**Table 1**). All patients beginning on OCPs for acne ought to be completely vetted relating to threat aspects, with particular focus on lifestyle options and family history. Patients ought to be routinely counseled about possible adverse effects from OCP use and asked about the development of any adverse effects at their follow-up visits ⁽¹⁵⁾.

Table 1: Contraindications to oral contraceptive use ⁽¹⁵⁾

Smokers older than 35 years' old	Morbid obesity
Undiagnosed abnormal uterine bleeding	Estrogen dependent neoplasms, breast cancer, endometrial cancer, hepatic adenomas and carcinomas
Pregnancy and lactation	History of jaundice in pregnancy or with prior OCP use
Thromboembolic disease	Hypersensitivity
Hypercoagulable states	Migraine headaches after age 35 or before age 35 with focal neurologic deficits/aura
Cardiovascular disease including poorly controlled hypertension, angina, complicated valvular disease	Diabetes with evidence of nephropathy, retinopathy, neuropathy, vascular disease or >20 years' duration
Hypertriglyceridemia	Severe cirrhosis

Other identified study ⁽¹⁶⁾ stated that the use of estrogen has a number of security problems, including: increased cardiovascular disease and hypercoagulability, and an increased risk of endometrial and breast cancers. To decrease the risk, a lot of OCPs consist of a mix of an estrogen with a progestin. Artificial progestins act at the progesterone receptor however likewise respond with the androgen receptor to varying degrees and thus may potentiate acne. They can also cause glucose intolerance and interfere with the effect of estrogen on sex-hormone binding globulin. Older synthetic progestins like the first-generation gonane, norethindrone, and the second-generation separates, norgestrel and levonorgestrel, were originated from progesterone ⁽¹⁶⁾.

Effectiveness and Safety of intrauterine device (IUD) Cooper:

The primary mechanism of action of the copper IUD is the prevention of fertilization through a cytotoxic inflammatory response that is spermicidal ⁽¹⁷⁾. In copper IUD users, the copper concentration in cervical mucous is considerable and causes an inhibition of sperm motility ⁽¹⁸⁾. Because copper ions likewise result in significant endometrial modifications, sperm migration, quality, and practicality at the level of the endometrium is prevented. This effect is thought to be the main system by which the copper IUD provides contraception ⁽¹⁹⁾. A number of private investigators have attempted to recover spermatozoa from the fallopian tubes of females using an IUD and from control topics not utilizing an IUD. Spermatozoa healing strategies varied between studies and sometimes were not reported in appropriate detail to allow for duplication. Nevertheless, after both groups were inseminated, considerably decreased varieties of spermatozoa were recovered from the ampullary portion of fallopian tubes in women utilizing a copper IUD in situ ^(18,20,21,22).

A number of investigators have taken a look at the effectiveness of different copper IUD devices. A Cochrane review published by Kulier et al ⁽²³⁾ in 2007 taken a look at 35 randomized controlled trials that all together included more than 50,000 women and made 16 various comparisons of effectiveness from the clinical literature. The authors concluded that the Copper T-380A was more efficient in preventing pregnancy than the other gadgets consisting of the Multiload 375, Multiload 250, Copper T-220, and Copper T-200.

Efficiency: Although Copper T-380A is authorized for usage in the United States for 10 years and is certified for usage in the United Kingdom for 8 years, it has actually been revealed to consistently preserve its efficacy for 12 years ⁽²⁴⁾. Many failures will take place in the very first year after insertion. Still, the yearly pregnancy rate, including both intrauterine and ectopic pregnancies, for the first year of use is rather low, in between 0.5 and 1.0 per 100 women ^(23,24,25). The released cumulative pregnancy rate for the staying contraceptive life span of the Copper T-380A has been consistently very low. An interim analysis of an ongoing, big, multinational research study reported an overall pregnancy rate of 1.7 per 100 females for the very first 3 years of use ⁽²⁵⁾. Other large studies have reported the cumulative pregnancy rate of 1.5 per 100 women for the first 7 years of use ^(24,26). The cumulative pregnancy rate appears to be very low after the seventh year. Pooled data from 2 big studies (n = 4,932) demonstrated no pregnancies after the eighth year of use ^(24,26). After 12 years

of use, a big multinational research study conducted by the World Health Organization reported that the cumulative pregnancy rate for the Copper T-380A was 2.2 per 100 women ^(24,26).

Thinking about pregnancy avoidance, the high efficacy of the Copper T-380A places it in the top tier of contraceptive methods and makes it comparable to the 10-year pregnancy rate of 1.9 per 100 ladies that has been reported in females who have actually undergone surgical sterilization ⁽²⁷⁾. There are likewise some little studies that have actually suggested that the Copper T-380A can be utilized beyond 12 years. A study performed by Bahamondes et al ⁽²⁸⁾ in Brazil, followed a small group of ladies using Copper T-380A for contraception for an overall of 16 years. Although most of women who had utilized the Copper T-380A for 10 years chose to cease it after they were informed it was just approved for usage for 10 years, 45% of subjects were still using the Copper T-380A at 12 years with no reported pregnancies. After 16 years of use, there were still no reported pregnancies; although by this time, almost 80% of subjects had actually stopped using the Copper T-380A. The mean age of the study population at the 10-year mark was 38.4 years. A study conducted by the Population Council followed women using the Copper T-380A through 20 years. The small number of subjects contributed a total of 70 woman-years of observation in between 15 and 20 years, and during this time duration, no ladies conceived ⁽²⁹⁾. In both studies, the reported high contraceptive effectiveness may have been associated with that females who have actually utilized an IUD for more than 12 years are normally older, with reduced fertility rates. Appropriate information is plainly lacking, the authors of these studies hypothesized that women as young as 25 could possibly use a Copper T-380A for contraception until menopause ⁽²⁹⁾.

Safety: Effective approaches of birth control, such as the Copper T-380A, have actually permitted many women around the world to prevent the health dangers of undesirable pregnancy and have actually provided for the spacing of pregnancies. This has actually added to enhancements in infant and child survival. There are only a handful of unfavorable occasions that accompany the Copper T-380A use consisting of infection, perforation, and expulsion. These infrequent events should constantly be viewed in perspective with the multiple health benefits associated with the ability to prepare fertility ⁽³⁰⁾.

Emergency contraception:

Emergency contraception prevents pregnancy after unprotected sexual intercourse has happened. Unlike hormonal emergency contraceptives, the copper IUD works by preventing implantation and can be inserted up to 120 hours after unguarded sexual intercourse ⁽³¹⁾. Usage of the Copper IUD as an emergency contraceptive has the included benefit of providing long-lasting, highly reliable contraception in a group at risk for unintentional pregnancy. In many places, the Copper T-380A is underutilized for this purpose.

Suggestions regarding using a copper IUD as an emergency situation contraceptive are based upon observational research studies performed in China. In a research study (32) of nearly 2,000 women, insertion of the Copper T-380A within 120 hours after unguarded sexual intercourse resulted in only 2 pregnancies (0.13%) over the course of a year ⁽³²⁾. A meta-analysis, ⁽³³⁾ that included multiple types of copper IUDs, reported just 1 pregnancy in 879 ladies who used a copper IUD after unprotected intercourse and estimated the pregnancy rate with postcoital IUD insertion to be 0.1%. A pregnancy rate much lower than the 1.5% priced quote for a single dose of levonorgestrel ^(34,35).

4. CONCLUSION

Constant OCPs are a safe and reputable form of birth control. The metabolic, hormonal, and endometrial results are comparable in constant and cyclic OCP users. The most frequently reported side effect of continuous OCP dosing is irregular vaginal bleeding, however the incidence of this reduces gradually and most patients will get amenorrhea after 1 year of treatment. Constant OCP dosing has proven effective in females with menstrual signs and dysmenorrhea, although larger randomized studies are suggested. Patient fulfillment with both cyclic and constant OCP use is high.

Intrauterine device contraceptive a very effective, safe, long-term, rapidly reversible method of contraception that does not interfere with intercourse, is exempt to forgetfulness, and once placed, is not subject to modifications in medical supply or access to health care. It is likewise nonhormonal, so it does not have any hormone-related side effects or contraindications and does not affect breastfeeding. The negative occasions of interest fall into 2 classifications: those related to an intrauterine device, such as dysmenorrhea, irregular bleeding, ectopic pregnancy, and expulsion of the device; and those related to progestogens, such as bloating, weight gain, and breast tenderness.

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