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An Overview of Efficiency, Safety, and Side Effects of Different Types of Contraceptive

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Abstract: **The aim of this review, was to summarize and assess the efficiency and safety of relevant evidence on different contraceptive methods and to emphasize the most suitable contraception method for different populations. We reviewed most articles related to our topic using electronic databases; PubMed/Medline, and Embase up to date we searched studies concerning the efficacy, safety of different types of contraceptive. We included randomized controlled trials, controlled clinical trials and reviews published. Restriction published to English language with human subject. Intrauterine system is an extremely effective, risk-free as well as reversible form of lasting yet relatively easy to fix contraception. Because its efficacy, it is a safer option to irreversible contraceptive methods such as sterilization. It is particularly useful in scenarios where use estrogen-containing birth controls is contraindicated. Attempting another oral solution could be useful, in some cases an adjustment to an additional kind of birth control could be ideal. This includes a progestogen-only approach, such as the contraceptive oral implant intrauterine system, or the non-hormonal copper intrauterine device. These long-acting reversible contraceptive methods are far more reliable at protecting against unexpected pregnancy compared to the pill. They should be discussed with all ladies asking for contraception, specifically those who cannot take the pill as a result of unfavorable effects or determined threat elements or who locate it difficult to remember to take the pill daily. The combined oral contraceptive pill is not suggested during lactation as it may influence breast milk quantity.**

Keywords: **Types of Contraceptive, Intrauterine System.**

1. INTRODUCTION

Contraception is defined as the deliberate prevention of fertilization through using numerous devices, chemicals, drugs, or procedures [(1)]. Nevertheless, in the pre-World War II era, contraception was not just out of favor, it was thought about criminal in several nations. The tablet is one of the most commonly utilized contraceptive method as well as around 50 - 80% of Australian females utilize it at some phase throughout their reproductive lives [(2)]. There is currently a big range of items available with over 30 various registered brand names. While much of these tablets contain comparable hormonal agents and also doses, there are multiple formulations for the prescriber to think about (**Figure 1**) [(2,3)].

Amongst a number of long-acting contraceptive techniques, the intrauterine device (IUD) is the most general as well as prominent it is second most prominent contraceptive technique worldwide after sterilization [(3,4)]. The original intrauterine devices (IUDs) were composed of contraceptive rings constructed of a selection of materials, ranging from steel to silkworm digestive tract [(5,6,7)]. Contraceptive choice is said to be partially dependent on exactly how effective the approach is and also extension rates are generally greater with even more effective techniques. With the male prophylactic, the percentage of ladies experiencing an unintended pregnancy within the very first year of normal usage was reported to be 15%, with the 53% of females proceeding usage at one year [(8,9)]. On the various other hand, with the intrauterine tool the percent of ladies experiencing an unintentional pregnancy within the initial year of normal usage was located to be 0.8%, with the 78% of ladies proceeding use at one year [(9)]. Little is known about health and wellness danger actions associations with birth control techniques aside from condoms. Furthermore, risk organizations between having actually made use of none, one, or multiple compounds as well as sort of contraceptive utilized across multiple sorts of techniques [(10)].

Brand name	Oestrogen	Progestogen	PBS listing
Femme-Tab ED 20/100 Microgynon 20 ED Microlevlen ED Loette Micronelle 20 ED	20 microgram ethinyloestradiol	100 microgram levonorgestrel	Only Femme-Tab ED 20/100 PBS listed
Femme-Tab ED 30/150 Levlen ED Microgynon 30 ED Monofeme Nordette Evelyn 150/30 ED Eleanor 150/30 ED Micronelle 30 ED	30 microgram ethinyloestradiol	150 microgram levonorgestrel	PBS listed
Microgynon 50 ED	50 microgram ethinyloestradiol	125 microgram levonorgestrel	
Logynon ED Trifeme 28 Triphasil Triquilar ED	6 x 30 microgram ethinyloestradiol	6 x 50 microgram levonorgestrel	
	5 x 40 microgram ethinyloestradiol	5 x 75 microgram levonorgestrel	
	10 x 30 microgram ethinyloestradiol	10 x 125 microgram levonorgestrel	
Brevinor 21 and 28 Day Norimin 28 Day	35 microgram ethinyloestradiol	500 microgram norethisterone	PBS listed
Brevinor-1 21 and 28 Day Norimin-1 28 Day	35 microgram ethinyloestradiol	1000 microgram norethisterone	
Norinyl-1 21 and 28 Day	50 microgram mestranol	1000 microgram norethisterone	
Improvil 28 Day Synphasic 28	7 x 35 microgram ethinyloestradiol	500 microgram norethisterone	
	9 x 35 microgram ethinyloestradiol	1000 microgram norethisterone	
	5 x 35 microgram ethinyloestradiol	500 microgram norethisterone	
Marvelon 28 Madeline	30 microgram ethinyloestradiol	150 microgram desogestrel	Not PBS listed
Minulet	30 microgram ethinyloestradiol	75 microgram gestodene	
Brenda-35 ED Carolyn-35 ED Diane-35 ED Estelle-35 ED Jene-35 ED Juliet-35 ED Laila-35 ED	35 microgram ethinyloestradiol	2 mg cyproterone acetate	
Yaz Yaz Flex	20 microgram ethinyloestradiol	3 mg drospirenone	
Isabelle Petibelle Yasmin	30 microgram ethinyloestradiol	3 mg drospirenone	
Valette	30 microgram ethinyloestradiol	2 mg dienogest	
Qlaira	2 x 3 mg oestradiol valerate	–	
	5 x 2 mg oestradiol valerate	5 x 2 mg dienogest	
	17 x 2 mg oestradiol valerate	17 x 3 mg dienogest	
	2 x 1 mg oestradiol valerate	–	
Zoely	1.5 mg oestradiol	2.5 mg nomegestrol acetate	

PBS Pharmaceutical Benefits Scheme

Figure 1: Combined oral contraceptive pills

The aim of this review, was to summarize and assess the efficiency and safety of relevant evidence on different contraceptive methods and to emphasize the most suitable contraception method for different populations.

2. METHODOLOGY

We reviewed most articles related to our topic using electronic databases; PubMed/Medline, and Embase up to date we searched studies concerning the efficacy, safety of different types of contraceptive. We included randomized controlled trials, controlled clinical trials and reviews published. Restriction published to English language with human subject.

3. DISCUSSION

Although several ladies are utilizing a contraceptive method, the unmet requirement for family planning is reported to be high, particularly in developing countries with 23% of ladies wed or in a union, in sub-Sahara Africa reporting that they want no more kids or wish to postpone their next pregnancy by two or more years, not utilizing birth control [(11)]. A restricted range of contraceptive methods is reported to be among the variables adding to this unmet requirement [(12)]. Unmet needs have actually also been determined in industrialized nation setups, such as in Europe [(13)]. It has actually been suggested that instead of attempting to reduce or remove unmet requirement in settings immune to alter, a method for meeting unmet demands may be to provide contraceptive methods that are appropriate to females' needs [(14)].

Efficacy& safety, and Mechanism of action Intrauterine device (IUD):

The primary mechanism of action of the IUD is the prevention of fertilization with a cytotoxic inflammatory reaction that is spermicidal [(15)]. In copper IUD individuals, the copper focus in cervical mucous is substantial and also leads to an inhibition of sperm motility [(16)]. Sperm movement, high quality, and feasibility at the degree of the endometrium is impeded since copper ions likewise result in substantial endometrial adjustments. This impact is believed to be the main mechanism whereby the IUD provides birth control [(17)]. A number of investigators have actually tried to recover spermatozoa from the fallopian tubes of ladies utilizing an IUD as well as from control topics not utilizing an IUD. Spermatozoa recuperation strategies ranged research studies as well as occasionally were not reported in adequate detail to enable replication. Nevertheless, after both groups were inseminated, considerably decreased varieties of spermatozoa were recouped from the ampullary section of fallopian tubes in females using a copper IUD sitting [(18,19)].

Numerous detectives have actually checked out the efficacy as well as safety of numerous IUD gadgets. A Cochrane evaluation released by Kulier et al [(20)] in 2007 analyzed 35 randomized controlled tests that with each other included greater than 50,000 ladies as well as made 16 various comparisons of efficiency from the clinical literary works. The authors wrapped up that the Copper T-380A was extra effective in stopping maternity than the other gadgets consisting of the Multiload 375, Multiload 250, Copper T-220, and also Copper T-200 [(20)].

Copper T-380A is approved for use in the United States for 10 years and also is accredited for usage in the United Kingdom for 8 years, it has actually been shown to constantly preserve its effectiveness for 12 years [(21)]. A lot of failures will certainly happen in the first year after insertion. Still, the annual maternity rate, consisting of both intrauterine as well as ectopic maternities, for the first year of use is rather reduced, in between 0.5 and also 1.0 each 100 females [(20,21,22)]. The published collective maternity price for the staying contraceptive life expectancy of the Copper T-380A has actually been continually really low. An acting analysis of a recurring, big, international study reported a complete maternity rate of 1.7 each 100 women for the very first 3 years of use [(23)]. Various other large researches have reported the collective pregnancy rate of 1.5 per 100 females for the first 7 years of use [(21,24)]. The cumulative maternity rate seems extremely reduced after the 7th year. Merged data from 2 large studies (n = 4,932) demonstrated no maternities after the eighth year of use [(21,24)]. After 12 years of use, a large international research study performed by the World Health Organization reported that the cumulative maternity rate for the Copper T-380A was 2.2 per 100 females [(21,24)].

Considering pregnancy avoidance, the high efficacy of the Copper T-380A puts it in the leading tier of contraceptive methods and also makes it comparable to the 10-year maternity price of 1.9 each 100 females that has actually been reported in women that have gone through medical sterilization [(26)]. There are likewise some small researches that have recommended that the Copper T-380A can be utilized beyond 12 years. A research study performed by Bahamondes et al [(26)] in Brazil, complied with a tiny group of women using Copper T-380A for birth control for a total of 16 years. The bulk of ladies who had made use of the Copper T-380A for 10 years selected to stop it after they were educated it was only approved for use for 10 years, 45% of subjects were still utilizing the Copper T-380A at 12 years with no reported pregnancies. After 16 years of use, there were still no reported pregnancies; although by now, almost 80% of topics had

actually stopped utilizing the Copper T-380A. The mean age of the research population at the 10-year mark was 38.4 years. A research study carried out by the Population Council adhered to women using the Copper T-380A with 20 years. The small number of topics added a total of 70 woman-years of observation in between 15 and also 20 years, and throughout this moment period, no females conceived [27]. In both research studies, the reported high contraceptive effectiveness could have been related to the fact that ladies that have actually utilized an IUD for more than 12 years are normally older, with lowered fertility prices. Sufficient information is plainly lacking, the writers of these research studies assumed that females as young as 25 might potentially use a Copper T-380A for contraception until menopause [27].

Opening of the womb happens at the time of IUD insertion at a price of 1- 2 per 1,000 insertions [28,29]. A study that consisted of more than 21,000 insertions with pooled information from numerous worldwide studies estimated the rate of perforation to be 1.5 each 1,000 insertions for the Copper T-380A [28]. Variables connected with a boosted danger of perforation include skill of the clinician and also anatomic elements, such as a stenotic cervix or an immobile or a retroverted uterus. Of note, no particular IUD has actually been found to be much easier to insert or more likely to pierce compared to the others [28].

Combined oral contraceptive, efficiency and safety:

Although the least expensive reported maternity rate for the combined pill throughout common use is 0%, recent researches suggest that maternities do happen, albeit seldom, throughout best use. For this reason, we established the perfect-use price quote for the pill at the really reduced level of 0.3%. The most affordable reported pregnancy rate for the progestin-only pill surpasses 1% [30,31]. It is most likely that the progestin-only tablet is much less reliable than the combined tablet throughout normal use, because the progestin-only tablet is probably less flexible of nonadherence to the application schedule. Whether the progestin-only pill is additionally much less efficient during best use is unidentified [32].

The first offered formulation of the integrated oral contraceptive pill included 50 micrograms of ethinyloestradiol for cycle control. Nonetheless, an association between the pill as well as venous thromboembolism quickly emerged. This was due to the result of oestrogen on the synthesis of clotting factors (30). To mitigate this threat, and also decrease oestrogenic damaging impacts, the dosage of ethinyloestradiol was reduced to 35 as well as 30 micrograms and extra just recently 20 microgram without an obvious loss of contraceptive efficacy [31].

The pills readily available in Australia are primarily in 28-day packs with 21 energetic and 7 non-active pills, to resemble the menstrual cycle. Some formulas consist of 24 energetic and also 4 non-active pills (24/4 regimens) which might lower the opportunity of contraceptive failure and also breakthrough ovulation [32]. Extended pill-taking programs are used by numerous females to delay or avoid a withdrawal bleed. This is most quickly attained with monophasic programs where each active pill has the exact same amount of oestrogen as well as progestogen as well as the non-active tablets are skipped. Generally, this is done for three months at once. Certainly, evidence is readily available to sustain the security of continuous use the birth control pill for as much as 12 months [33].

An additional technique is called a 'menstrually signalled' regimen. Ladies take the pill continually up until they experience four days of vaginal detecting or bleeding after which they have a four-day pill break. Triphasic pills are commonly prescribed in Australia, yet have no evidence-based advantage over monophasic pills in connection with their damaging effect account or cycle control. A quadriphasic combined oral contraceptive pill which contains oestradiol valerate and desogestrel is developed with an oestrogen step-down and progestogen step-up sequence [34].

The pill is a user-dependent method. Its failing price for that reason differs between 'perfect usage' (0.3% every year) by ladies that take it consistently as well as appropriately and 'normal use' (9% yearly) when the pill is made use of inconsistently or incorrectly [35].

Lasting associate researches reveal that, compared to non-users of the integrated oral contraceptive pill, users have lower rates of death from any type of cause. They likewise have considerably reduced prices of fatality from cancer cells, heart disease as well as other illness [36]. Ladies might experience a range of damaging effects as well as managing these can be tough. (**Figure 2**) lays out some usual damaging impacts as well as approaches that could enhance the symptoms should the female desire to continue with the pill.

Problem	Management strategies based on practice
Nausea	Reduce oestrogen dose Exclude pregnancy Take pills at night Change to progestogen-only method
Breast tenderness	Reduce oestrogen and/or progestogen dose Change progestogen Consider using a pill containing drospirenone
Bloating and fluid retention	Reduce oestrogen dose Change to progestogen with mild diuretic effect (i.e. drospirenone)
Headache	Reduce oestrogen dose and/or change progestogen If headache occurs in hormone-free week, consider: • extended use or • giving oestradiol 50 microgram transdermal patch in this week or • try oestradiol valerate/dienogest pill[18]
Dysmenorrhoea	Extended pill regimen to reduce the frequency of bleeding
Decreased libido	No evidence supports a benefit of one type of oral contraceptive pill over another
Breakthrough bleeding	If taking an ethinyloestradiol 20 microgram pill, increase oestrogen dose to a maximum of 35 microgram Change progestogen if already taking an ethinyloestradiol 30–35 microgram pill Try another form of contraception. Consider the vaginal ring.

Figure 2: Managing Common adverse effects associated with the combined oral contraceptive pill

Venous thromboembolism as risk factor of combined contraceptive pills:

There is a risk of venous thromboembolism associated with the combined hormonal contraception, but the risk is much less than that during pregnancy and the immediate postpartum period. Non-users of hormonal contraception have a baseline risk for venous thromboembolism of around 20 per 100 000 woman-years. Current research points to a three-fold increased risk of venous thromboembolism for women using a combined pill over baselin [(37,38)]. Women should be informed of the risk of venous thromboembolism with combined oral contraceptive pills and be aware of the signs. The factors that influence the risk include age, smoking, body mass index, immobilisation, and a personal or family history of thromboembolism or thrombogenic mutations. These factors need to be assessed when considering the safety of the combined oral contraceptive pill. If a woman has a significant risk factor for venous thromboembolism, she is not suitable for any combined hormonal method. Progestogen-only methods are safer for women with risk factors for venous thromboembolism. The risk of venous thromboembolism appears to vary with oestrogen dose and progestogen type. Pills containing 50 microgram ethinyloestradiol have the highest risk. Compared with pills containing levonorgestrel, those with desogestrel, gestodene, cyproterone acetate and drospirenone may have a higher risk, although the evidence is conflicting [(39,40)].

4. CONCLUSION

Intrauterine system is an extremely effective, risk-free as well as reversible form of lasting yet relatively easy to fix contraception. Because its efficacy, it is a safer option to irreversible contraceptive methods such as sterilization. It is particularly useful in scenarios where use estrogen-containing birth controls is contraindicated. Attempting another oral solution could be useful, in some cases an adjustment to an additional kind of birth control could be ideal. This includes a progestogen-only approach, such as the contraceptive oral implant or intrauterine system, or the non-hormonal copper intrauterine device. These long-acting reversible contraceptive methods are far more reliable at protecting against unexpected pregnancy compared to the pill. They should be discussed with all ladies asking for contraception, specifically

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