Original Article
ISSN (Online): 2350-0530
ISSN (Print): 2394-3629

International Journal of Research - GRANTHAALAYAH
January 2025 13(1), 28–35

A REVIEW STUDY ON SMALL DIFFERENTIATIVE BETWEEN ORAL CONTRACEPTIVES (PROGESTIN-ONLY PILLS/ COMBINED HORMONAL PILLS)

Khushi Upadhyay [1], Shaily Tyagi [2] ✉, Ompi Kumari [3], Soumya Bharadwaj [3]

[1] Research Scholar, Quantum University, Roorkee, India
[2] Assistant Professor, Quantum University, Roorkee, India
[3] Assistant Professor, Lord Buddha Koshi Pharmacy College, Baijnathpur, Saharsa, Bihar, India

Received 11 November 2024
Accepted 16 December 2024
Published 31 January 2025

Corresponding Author
Shaily Tyagi, shailytyagi664@gmail.com

DOI
10.29121/granthaalayah.v13.i1.2025.5903

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

Oral contraceptive pills, are commonly used drugs to manage a number of reproductive health issues and prevent unwanted births. They are divided into two main categories: progestin-only pills (POPs) and combined oral contraceptives (COCs), which contain synthetic estrogen and progestin. In order to stop conception and implantation, COCs mainly function by suppressing ovulation, thickening cervical mucus, and changing the endometrial lining.

Numerous people utilize contraceptives; according to 2019 statistics, 790 million (42%) use the traditional technique. The most popular methods of birth control are female sterilization and male condoms, which are used by 922 million women of reproductive age worldwide. According to 2019 data, 219 million of these women (24%), and 189 million of them (21%), use female sterilization and male condoms, respectively. Since 1994, the use of IUDs and conventional procedures has decreased globally. The WHO states that the condom is the only method of birth control that can prevent both unwanted pregnancies and STDs. Between 2015 and 2020, the need for family planning increased by 77% worldwide. In 2020, there will be 2000 million women who have used family planning methods, up from 900 million in the previous 20 years. The number of people using modern contraceptive techniques has likewise climbed from 663 million to 851 million, with a 47.7% to 49.0% prevalence rate. Numerous types of birth control are available, including hormonal treatments, which include CHC vaginal rings, CHC transdermal patches, and combination hormonal contraceptives. IUDs with progestin, DMPA injections, implants, progestin-only pills, and hormonal male contraceptives are examples of progestin-only techniques. The other approach is non-hormonal and involves vaginal pH modulators, barrier techniques like condoms, and copper IUDs.

Keywords: Combined Oral Contraceptives, Oral Contraceptives, Birth Control Pills, Hormonal Contraceptives, Mini Pills

1. INTRODUCTION

One common form of birth control that gives women an efficient way to avoid getting pregnant is oral contraceptive pills, or OCPs. These drugs are taken orally, and their main mechanism of action is to change a woman's hormone balance. Oral contraceptives have revolutionized reproductive health since their invention, providing not only contraception but also other health advantages.

Oral contraceptives that are combined (COCs): They include two hormones: progestin, a synthetic version of progesterone, and estrogen, typically ethinyl

estradiol. Function by weakening the uterine lining, thickening cervical mucus, and inhibiting ovulation.

Triphasic (changing hormone levels throughout the cycle), biphasic, and monophasic (continuous hormone levels) are among the several formulations that are available. Usually taken for 21 days, with a 7-day placebo or hormone-free break in between to allow for withdrawal symptoms.

1.1. PROGESTIN-ONLY PILLS

Progestin only pills are appropriate for women who are unable to utilize estrogen because they solely contain progestin (such as nursing mothers or those who have a history of blood clots). They mainly by weakening the uterine lining and thickening cervical mucus, with less reliable ovulation suppression. The progestin-only pill (POP), sometimes referred to as the mini-pill, is a kind of oral contraception that doesn't contain estrogen and only contains progestin, a synthetic form of progesterone. It is frequently used as a form of birth control, particularly for women who are unable to use estrogen-containing methods. Sperm cannot access the uterus because POPs thicken the cervical mucus. POPs inhibit ovulation, or the release of an egg, in certain women. Comparing this effect to combined oral contraceptives, however, shows less consistency.

2. HORMONAL CONTRACEPTIVES

2.1. COMBINED HORMONAL CONTRACEPTIVES

It includes the combination of synthetic estrogen and progestins. Its failure rate is less than 1% with the proper prescribed use and 7% to 9% with typical unprescribed use. These are most often prescribed by medical practitioner. Progestin prevents the release of eggs from ovaries by inhibiting LH surge, results in suppressed ovulation. They thicken the cervical mucus and makes the endometrium atrophic. Estrogen suppress FSH production, results in inhibition of development of dominant follicle. CHCs are basically taken for three weeks. Withdrawal bleeding takes place after three weeks that may assure that user is not pregnant.

Common side effects of CHCs includes shorter menstrual cycle, reduction in menstrual flow upto 40% to 50%, nausea, breast tenderness, headaches, emotional stress, irregular bleeding, reduced PMS.

2.2. SOME DISADVANTAGES LIKE

- POPs need to be taken at the same time every day, three hours apart (or twelve hours apart for certain more recent POPs, such as tablets that include desogestrel).
- Spotting, irregular periods, or amenorrhea (lack of periods) are common adverse effects.
- Its efficacy may be less than that of combined oral contraceptives if improperly used.

CHCs pills: These pills are available in markets easily; they contain the combinational salt of 10 to 35 mcg ethinyl estradiol and a generation of progestins. Theses pills should be taken at same time every day, if the dose is missed then user should take the dose as soon as they remember, the gap of more than 48 hours between missing dose do not assure the ovulation suppression, missing of a pill will

have effect on effectiveness of the pill. In case if the dose is missed the backup contraceptive method should be used for 7 days to prevent pregnancy.

Major disadvantages of hormonal pills:

- They do not protect against sexually transmitted diseases.
- Doses should not be missed.
- Irregular bleeding, low menstrual flow.
- Women with high BP cannot take these pills.
- These pills can often cause cycle irregularities.

CHC transdermal patch: it is a thin square of 2 inches, it contains the combinational salt of 150 mcg norelgestromin and 35 mcg ethinyl estradiol. It can be placed anywhere like stomach arm buttocks and is should be completely attached on the skin for maximum effective results. It is used for three weeks and is replaced every week for up to three weeks.

Major disadvantages:

- It does not protect against sexually transmitted diseases.
- Irregular bleeding
- It can cause reactions and side effects like headaches, nausea etc.
- Can skin reactions like irritation.

3. DIFFERENCE BETWEEN PROGESTIN ONLY PILLS OR COMBINED HORMONAL PILL

1) Progestin Pills:

They do not contain estrogen; it only contains progestin, a synthetic version of the Hormone progesterone.

To stop sperm from getting to the egg, cervical mucus is thickened.

lessens the chance of implantation by thinning the lining of the uterus.

suppresses ovulation in certain situations (but not as frequently as CHCs).

Women with a history of blood clots, lactation, migraines with aura, or other contraindications to estrogen, or those who are unable to take it.

It must be taken daily at the same time. Delays of even a few hours can lessen their efficacy. Side effects could include spotting, irregular bleeding, or no periods at all. Strict scheduling is necessary; it must be taken daily at the same time within a window of only three hours (some more recent POPs permit up to twelve hours).

2) Combined Hormonal pill:

Both progestin and estrogen are present in its composition.

Consistently stops ovulation by inhibiting the ovaries' ability to release eggs.

thins the uterine lining and thickens cervical mucus (similar to POPs).

Women who don't have any estrogen contraindications and who want normal menstrual cycles or extra benefits (such lighter periods or less acne).

More adaptable than POPs; protection is usually maintained even if a dose is missed

For up to 12 hours. Side effects include breast pain, nausea, and an elevated chance of blood clots; however, most women have a low risk of this.

Women with estrogen contraindications (such as a history of thromboembolic events, migraines with aura, uncontrolled hypertension, etc.) are not advised to use this medication.

The majority of sexually active women, particularly those in their teens, are quite concerned about preventing unwanted pregnancies. Eighty-one percent of women between the ages of 15 and 19 who were at risk of becoming pregnant unintentionally were estimated to have used contraceptive techniques in 1995; many of them reported using two methods: one as a contraceptive method and the other to prevent sexually transmitted diseases (STDs). Male condoms accounted for 46% of the instances, oral contraceptives for 44% of the cases, or both systems for 8% of the cases. However, user compliance is crucial to the success of these techniques. Particularly with teenagers, the issues include improper pill consumption or not using a condom right before sex.

Table 1

Table 1 Feature	**Progestin-Only Pills (POPs) And Combined Hormonal Pills (CHCs)**	
Hormones	**Progestin only**	**Estrogen + Progestin**
Mechanism:	Thickens mucus, thins uterine lining, sometimes inhibits ovulation	Consistently inhibits ovulation, thickens mucus, thins uterine lining
Timing Strictness	Very strict (3-12 hours)	More forgiving (24 hours)
Bleeding Patterns	Irregular or no periods	Regular, predictable periods

The availability of fake medications on the illicit market is influenced by a number of factors, according to the World Health Organization (WHO). These causes include inadequate national regulations for the production and distribution of drugs, lax enforcement of drug laws, inadequate penalties for drug law infractions, and inadequate regulation among exporting nations. The intricate transactions involving numerous middlemen, the high demand and expense for preventative and curative medications, and the ineffective cooperation of stakeholders are additional significant reasons.

The ease of getting prescription goods from online platforms and their relatively reduced prices compared to products purchased from conventional pharmacies are the main reasons for the growing popularity of online pharmacies. However, a significant public health concern has been the quality of prescription medications purchased online. Furthermore, it may be doubtful if internet pharmacies that sell prescription medications are legitimate. Most significantly, there are worries about consumer safety because improper prescription medication use may be harmful. Thus, the current study focused on three key topics in order to do a systematic analysis of online pharmacies: the nature and traits of internet pharmacies; the caliber of prescription medications bought online; and the traits of customers buying prescription medications.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

American College of Obstetricians and Gynecologists' Committee on Health Care for Underserved Women, Contraceptive Equity Expert Work Group, and Committee on Ethics. Patient-centered Contraceptive Counseling: ACOG Committee Statement Number 1. Obstet Gynecol 2022;139:350. https://doi.org/10.1097/AOG.0000000000004659

American Public Health Association (2021). Opposing Coercion in Contraceptive Access and Care to Promote Reproductive Health Equity. Policy No. 202110: American Public Health Association.

Amy, J. J., & Tripathi, V. (2009). Contraception for Women: An Evidence Based Overview. Bmj, 339 https://doi.org/10.1136/bmj.b2895

Bradley, SEK., Polis, C.B., Micks, E.A., Steiner, M, J. (2023). Effectiveness, Safety, and Comparative Side Effects. In: Cason P CC, Edelman A, Kowal D, Marrazzo JM, Nelson AL, Pollicar MS, Hatcher RA, eds. Contraceptive Technology. 22nd ed. Burlington, MA: Jones-Bartlett Learning.

CDC (2021). US Public Health Service Preexposure Prophylaxis for the Prevention of HIV Infection in the United States-2021 Update: A Clinical Practice Guideline. Atlanta, GA: US Department of Health and Human Services, CDC.

CDC (2021). Updating CDC's Contraception Guidance Documents: U.S. Medical Eligibility Criteria for Contraceptive use and U.S. Selected Practice Recommendations for Contraceptive Use. Atlanta, GA: US Department of Health and Human Services, CDC.

Cole, L.A., Ladner, D.G., Byrn, F/W. (2009). The Normal Variabilities of the Menstrual Cycle. Fertil Steril 91:52PMID:18433748 https://doi.org/10.1016/j.fertnstert.2007.11.073

Curtis, K.M., Jatlaoui, T.C., & Tepper, N.K., et al (2016). U.S. Selected Practice Recommendations for Contraceptive use. MMWR Recomm Rep 65:1-66. PMID:27467319 https://doi.org/10.15585/mmwr.rr6504a1

Curtis, K.M., Nguyen, A., Reeves, J.A., Clark, E.A., Folger, S.G., & Whiteman. M.K. (2021). Update to U.S. selected practice recommendations for contraceptive use: self-administration of subcutaneous depot medroxyprogesterone acetate. MMWR Morb Mortal Wkly Rep 70:739-43. PMID:34014910 https://doi.org/10.15585/mmwr.mm7020a2

Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, CDC. U.S. Selected Practice Recommendations for Contraceptive Use, 2013: Adapted from the World Health Organization Selected Practice Recommendations for Contraceptive Use, 2nd Edition. MMWR Recomm Rep 2013;62(No. RR-5):1-60. PMID:23784109

Donnet, M.L., Howie, P.W., Marnie, M., Cooper, W., & Lewis, M. (1990). Return of Ovarian Function Following Spontaneous Abortion. Clin Endocrinol (Oxf) 1990;33:13-20. PMID:2401092 https://doi.org/10.1111/j.1365-2265.1990.tb00460.x

Festin, M.P.R. (2020). Overview of Modern Contraception, Best Practice & Research Clinical Obstetrics & Gynaecology, 66 https://doi.org/10.1016/j.bpobgyn.2020.03.004

Gavin, L., Moskosky, S., & Carter, M. et al (2014). CDC. Providing Quality Family Planning Services: Recommendations of CDC and the U.S. Office of

Population Affairs. MMWR Recomm Rep 63(No. RR-4):1-54. PMID:24759690

Gavin, L., Pazol, K., & Ahrens, K. (2017). Update: Providing Quality Family Planning Services-Recommendations from CDC and the U.S. Office of Population Affairs. MMWR Morb Mortal Wkly Rep 66:1385. https://doi.org/10.15585/mmwr.mm6650a4

Gavin, L., Pazol, K., (2015). Update: Providing Quality Family Planning Services-Recommendations from CDC and the U.S. Office of Population Affairs. MMWR Morb Mortal Wkly Rep 65:231-4. PMID:26963363 https://doi.org/10.15585/mmwr.mm6509a3

Guyatt, G., Oxman, A.D., & Akl, E.A., et al (2011). GRADE guidelines: 1. Introduction-GRADE Evidence Profiles and Summary of Findings Tables. J Clin Epidemiol 64:383-94. PMID:21195583 https://doi.org/10.1016/j.jclinepi.2010.04.026

Guyatt, G.H., Oxman, A.D., Vist, G.E., et al.(2008). GRADE Working Group. GRADE: an Emerging Consensus on Rating Quality of Evidence and Strength of Recommendations. BMJ 336:924-6. PMID:18436948 https://doi.org/10.1136/bmj.39489.470347.AD

Harris, R.P., Helfand, M., & Woolf, S.H. et al. (2001). Methods Work Group, Third US Preventive Services Task Force. Current methods of the US Preventive Services Task Force: a review of the process. Am J Prev Med 20(Suppl):21-35. PMID:11306229 https://doi.org/10.1016/S0749-3797(01)00261-6

Holt, K., Reed, R., Crear-Perry, J., Scott, C., Wulf, S., & Dehlendorf, C. (2020). Beyond same-day long-acting reversible contraceptive access: a person-centered framework for advancing high-quality, equitable contraceptive care. Am J Obstet Gynecol S878.e1, 878.e6. PMID:31809706 https://doi.org/10.1016/j.ajog.2019.11.1279

Institute of Medicine (2001) . Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, Dc: The National Academies Press.

Leo,V.D., Musacchio,M.C., Cappelli,V.,Piomboni,P., & Morgante,G. (2016). Hormonal contraceptives: Pharmacology Tailored to Women's Health, Human Reproduction Update, 22 (5), https://doi.org/10.1093/humupd/dmw016

Malmborg, A., Brynte, L., Falk, G., Brynhildsen, J., Hammar, M., & Berterö, C. (2020). Sexual Function Changes Attributed to Hormonal Contraception Use - A Qualitative Study of Women Experiencing Negative Effects. The European Journal of Contraception & Reproductive Health Care 25:3 https://doi.org/10.1080/13625187.2020.1736545

Mohllajee, A.P., Curtis, K.M., Flanagan, R.G., Rinehart, W., Gaffield, M.L., & Peterson, H.B. (2005). Keeping up with evidence a new system for WHO's evidence-based family planning guidance. Am J Prev Med 28:483-90. PMID:15894153 https://doi.org/10.1016/j.amepre.2005.02.008

Nguyen, A.T., Curtis, K.M., & Tepper, N.K. et al. (2024). U.S. Medical Eligibility Criteria for Contraceptive use, 2024. MMWR Recomm Rep ;73(No. RR-4):1-126. https://doi.org/10.15585/mmwr.rr7304a1

Page, M.J., McKenzie, J.E., Bossuyt, P.M., et al. (2021). The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. BMJ 372:n71. PMID:33782057 https://doi.org/10.1136/bmj.n71

Pandey, S., Karki, S., & Pradhan, A. (2009). Practice of Contraceptives. Journal of Institute of Medicine Nepal, 31(3), 3-9. https://doi.org/10.59779/jiomnepal.397

Potter, J.E., Stevenson, A.J., Coleman-Minahan, K. et al (2019). Challenging Unintended Pregnancy as an Indicator of Reproductive Autonomy.

Contraception 100:1-4. PMID:30851238 https://doi.org/10.1016/j.contraception.2019.02.005

Reproductive Health National Training Center (2022). Contraceptive Counseling and Education Elearning.

Rivera, R., Yacobson, I., & Grimes,D. (1999). The mechanism of Action of Hormonal Contraceptives and Intrauterine Contraceptive Devices, American Journal of Obstetrics and Gynecology, 181 (5), https://doi.org/10.1016/S0002-9378(99)70120-1

Rocca, M.L., Palumbo, A.R., Visconti, F., & Di Carlo, C. (2021). Safety and Benefits of Contraceptives Implants: A Systematic Review. Pharmaceuticals https://doi.org/10.3390/ph14060548

Rogerio A. Lobo, Frank, Z. & Stanczyk (1994). New knowledge in the Physiology of Hormonal Contraceptives, American Journal of Obstetrics and Gynecology, 170 (5), Part 2, https://doi.org/10.1016/S0002-9378(94)05011-8

Schindler AE. Non-Contraceptive Benefits of Oral Hormonal Contraceptives. Int J Endocrinol Metab. 2013 Winter;11(1):41-7. doi: 10.5812/ijem.4158. Epub 2012 Dec 21. PMID: 23853619; PMCID: PMC3693657. https://doi.org/10.5812/ijem.4158

Sitruk-Ware, R. & Nath, A. (2010). The use of Newer Progestins for Contraception, 82 (5), https://doi.org/10.1016/j.contraception.2010.04.004

Stanback, J., Nakintu, N., Qureshi, Z., & Nasution, M. (2006). Does Assessment of Signs and Symptoms Add to the Predictive Value of An Algorithm to Rule Out Pregnancy? J Fam Plann Reprod Health Care 32:27-9. PMID:16492334 https://doi.org/10.1783/147118906775275370

Stanback, J., Nanda, K., Ramirez, Y., Rountree, W., & Cameron, S.B. (2008). Validation of a Job Aid to Rule Out Pregnancy Among Family Planning Clients in Nicaragua. Rev Panam Salud Publica 23:116-8. PMID:18371282 https://doi.org/10.1590/S1020-49892008000200007

Stanback, J., Qureshi, Z., Sekadde-Kigondu, C., Gonzalez, B., & Nutley, T. (1999). Checklist for Ruling Out Pregnancy Among Family-Planning Clients in Primary Care. Lancet 354:566. PMID:10470704 https://doi.org/10.1016/S0140-6736(99)01578-0

Steenland, M.W., Rodriguez, M.I., Marchbanks, P.A., & Curtis, K.M. (2013). How does the Number of Oral Contraceptive Pill Packs Dispensed or Prescribed Affect Continuation and other Measures of Consistent and Correct Use? A Systematic Review. Contraception 2013;87:60510. PMID:23040121 https://doi.org/10.1016/j.contraception.2012.08.004

Steenland, M.W., Zapata, L.B., Brahmi, D., Marchbanks, P.A., & Curtis, K.M. (2013). Appropriate Follow up to Detect Potential Adverse Events After Initiation of Select Contraceptive Methods: A Systematic Review. Contraception 87:611-24. PMID:23177264 https://doi.org/10.1016/j.contraception.2012.09.017

Steenland, M.W., Zapata, L.B., Brahmi, D., Marchbanks, P.A., Curtis, K.M. (2013). The Effect of Follow-up Visits or Contacts After Contraceptive Initiation on Method Continuation and Correct Use. Contraception 87:625-30. PMID:23114736 https://doi.org/10.1016/j.contraception.2012.09.018

Steiner, R.J., Pampati, S., Kortsmit, K.M., Liddon, N., Swartzendruber, A., & Pazol, K. (2021). Long-Acting Reversible Contraception, Condom Use, and Sexually Transmitted Infections: A Systematic Review and Meta-analysis, American Journal of Preventive Medicine, 61 (5), https://doi.org/10.1016/j.amepre.2021.04.032

Teal, S., & Edelman, A. (2021). Contraception Selection, Effectiveness, and Adverse Effects: A Review. JAMA. 326(24):2507-2518. doi:10.1001/jama.2021.21392 https://doi.org/10.1001/jama.2021.21392

Tepper, N.K., Curtis, K.M., Steenland, M.W., Marchbanks, P.A. (2013). Physical Examination Prior to Initiating Hormonal Contraception: A Systematic Review. Contraception 87:650-4. PMID:23121820 https://doi.org/10.1016/j.contraception.2012.08.010

Tepper. N.K., Steenland, M.W., Marchbanks, P.A., & Curtis, K.M. (2013). Laboratory Screening Prior to Initiating Contraception: A Systematic Review. Contraception 87:645-9. PMID:23040133 https://doi.org/10.1016/j.contraception.2012.08.009

Torpey, K., Mwenda, L., & Kabaso, M., et al (2010). Excluding Pregnancy Among Women Initiating Antiretroviral Therapy: Efficacy of a Family Planning Job Aid. BMC Public Health 10:249. PMID:20470367 https://doi.org/10.1186/1471-2458-10-249

United Nations Population Fund (1994). Programme of Action of the International Conference on Population and Development. Cairo, Egypt: United Nations, 5-13.

Wilcox, A.J., Dunson, D., & Baird, D.D. (2000). The Timing of the "Fertile Window" in the Menstrual Cycle: Day Specific Estimates from a Prospective Study. BMJ 321:1259-62. PMID:11082086 https://doi.org/10.1136/bmj.321.7271.1259

Workowski, K.A., Bachmann, L.H., & Chan, P.A. et al (2021). Sexually Transmitted Infections Treatment Guidelines. MMWR Recomm Rep 70:1-187. PMID:34292926 https://doi.org/10.15585/mmwr.rr7004a1

World Health Organization (2004). Selected Practice Recommendations for Contraceptive use, 2nd ed. Geneva, Switzerland: WHO Press.

World Health Organization (2015). Medical Eligibility Criteria for Contraceptive use. Geneva, Switzerland: World Health Organization.

World Health Organization (2016). Selected Practice Recommendations for Contraceptive use. Geneva, Switzerland: World Health Organization; 2016.

World Health Organization. Framework for Ensuring Human Rights in the Provision of Contraceptive Information and Services. Geneva, Switzerland: World Health Organization.