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An Overview of Pharmacological Properties of Different Types of Contraceptives.

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ABSTRACT

Unintended pregnancies, particularly among adolescents, remain a significant public health concern. This review examines the pharmacological properties, efficacy, and factors influencing the selection and consistent use of various contraceptive methods. It focuses on hormonal contraceptives, including oral contraceptive pills (OCPs), depot-medroxyprogesterone acetate (DMPA), and implants, as well as non-hormonal options such as intrauterine devices (IUDs) and transcervical sterilization. The review also addresses the impact of newer contraceptive formulations, progestins, and delivery methods on compliance, side effects, and overall contraceptive success.

Introduction

The availability of a wide range of contraceptive methods has significantly impacted reproductive health, offering individuals greater control over family planning. However, unintended pregnancies continue to occur at a concerning rate, often linked to delays in seeking family planning services, especially among adolescents. Studies indicate that a substantial proportion of unintended conceptions among adolescents occur shortly after the initiation of sexual activity, highlighting the need for accessible and effective contraceptive options.

This review aims to provide a comprehensive overview of the evaluation and pharmacological properties of different types of contraceptives. It will cover hormonal contraceptives, including OCPs, DMPA, and implants, as well as non-hormonal options such as IUDs and transcervical sterilization. Additionally, the review will address the impact of newer contraceptive formulations, progestins, and delivery methods on compliance, side effects, and overall contraceptive success.

Hormonal Contraceptives

1. Oral Contraceptive Pills (OCPs)

OCPs are still a common contraceptive option; changes in formulation have increased safety and tolerance. Newer OCPs use nonsteroidal progestins such drospirenone, fewer androgenic progestins, and low and ultra-low levels of estrogen. OCPs work by suppressing gonadotropins, inhibiting ovulation, changing fallopian tube mobility, and modifying cervical mucus, so preventing sperm penetration.

The efficacy of OCPs depends on adherence and regular use. Research has looked at elements linked to low OC user compliance and early cessation. Compared to conventional start techniques, the "Quick Start" approach, which starts OCP use on the day of the clinic appointment, has been demonstrated to increase patient compliance.

2. Injectable Contraceptives: Depot-Medroxyprogesterone Acetate (DMPA)

DMPA is a long-acting progestin-only contraception given by intramuscular injection. For women looking for contraception, it provides a practical, non-daily choice. With over 68 million women in over 114 countries using this approach, DMPA has been widely employed all around.

Among its many benefits, DMPA is quite effective and may help women with gynecological issues like menorrhagia, dysmenorrhea, and iron deficiency anemia. It might also be especially good for women with menstrual cycle-related conditions such premenstrual syndrome or migraine headaches. For women over 35 who smoke, the American College of Obstetricians and Gynecologists advises progestin-only contraceptives such as DMPA.

Contraceptive Patch

The first transdermal contraceptive patch, Ortho Evra, which included ethinyl estradiol (EE) and norelgestromin, was authorized by the FDA in 2001. With the extra advantage of better compliance, clinical studies showed comparable effectiveness and menstrual cycle control relative to daily OCPs. Studies, meanwhile, indicated Ortho Evra might be less effective in women over 198 lb (90 kg).

Progestin-Only Contraceptives

Women who cannot handle estrogen have progestin-only OCs, sometimes called "minipills," as a choice. These contraceptives, including injectable medroxyprogesterone acetate (Depo-Provera), have been connected to reversible declines in bone density.

Intrauterine Devices (IUDs)

IUDs have a lengthy history and have seen varying appeal. Contraception is currently mostly provided using the levonorgestrel-releasing intrauterine system (LNG IUS). It offers efficient contraception by releasing LNG straight into the uterine cavity. .

Transcervical Sterilization

Transcervical sterilization provides a non-surgical method to permanent contraception. Placed under hysteroscopic view, the Essure microinsert blocks fertilization by means of fallopian tube obstruction.

New Progestins

New progestins have been developed to increase the safety and tolerability of hormonal contraceptives. Derived from testosterone, progestins attach to the androgen receptor and exhibit different levels of androgenic activity. Highly androgenic progestins can have negative metabolic consequences such as lower serum high-density lipoprotein, higher low-density lipoprotein, and diabetes. On the other hand, androgens have good effects as well, including endometrial suppression and bone development stimulation.

Among second-generation OCs, Levonorgestrel (LNG), a second-generation progestin in OCPs, is quite androgenic. A synthetic analogue of spirinolactone, drospirenone (DRSP) has antiandrogenic and antimineralocorticoid properties. OCPs with DRSP have shown advantages in lowering androgenic adverse effects.

Effects of Contraceptives on Bone Mineral Density (BMD)

Particularly among teenage users, the effect of hormonal contraceptives on BMD has been a source of worry. Research indicates DMPA use can be linked to lower BMD in teenagers. Some studies, meantime, have revealed no statistically significant change in BMD between DMPA and OC users.

Weight Changes

Women thinking about hormonal contraception frequently express worry about weight increase. Although some research points to a possible link between DMPA use and weight increase, the data is not definitive. OCP data do not indicate a major impact on body weight.

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Menstrual Changes

Hormonal contraceptives can lead to menstrual irregularities including spotting, irregular bleeding, and alterations in the length of menses. Although these alterations are quite typical in the first months of use, they usually decline with time. Many women finally become amenorrheic using DMPA.

Sterilization Failure Rates

Over a ten-year period, the US Collaborative Review of Sterilization (CREST) investigated surgical sterilization failure rates. For all techniques combined, the average cumulative pregnancy probability was 18.5 pregnancies per 1000 sterilization operations.

Conclusion

Healthcare professionals and people looking for family planning services must carefully consider the assessment and pharmacological characteristics of various kinds of contraception. Though they could have negative effects and call for regular usage, hormonal contraceptives—including OCPs, DMPA, and implants—offer good choices. Long-acting or permanent birth control is provided by non-hormonal choices include IUDs and transcervical sterilization. Younger contraceptive formulations and delivery systems have sought to increase compliance, lower side effects, and improve general contraceptive efficacy. People can choose the most appropriate contraceptive approach for their requirements by carefully weighing the advantages, hazards, and personal preferences.

Bibliography

1. Rosenberg et al. (1995). A survey to investigate the association of a number of factors with poor compliance and early discontinuation among OC users.

2. Trussell J. Contraceptive failure in the United States. Contraception. 2011;83(5):397-404.

3. Schwallie PC, Assenzo JR. Contraceptive use of depot-medroxyprogesterone acetate: a critical review. Contraception. 1974;10(2):111-135.

4. Peterson LS, Oakley D, Potter LS, et al. Method choice and continuation among oral contraceptive and injectable contraceptive users. Contraception. 1998;57(3):173-178.

5. Westhoff CL, Davis A, Morroni C, et al. Depot medroxyprogesterone acetate (DMPA) discontinuation: a prospective cohort study. Contraception. 2003;68(4):277-283.

6. American College of Obstetricians and Gynecologists. Hormonal contraception. ACOG Practice Bulletin No. 73. Obstet Gynecol. 2006;107(6):1453-1472.

7. World Health Organization. Depot-medroxyprogesterone acetate (DMPA) and risk of breast cancer. WHO Collaborative Study of Neoplasia and Steroid Contraceptives. Lancet. 1991;338(8776):1207-1214.

8. Finer LB, Zolna MR. Unintended pregnancy in the United States: incidence and disparities, 2006. Contraception. 2011;83(6):531-540.

9. Jones J, Mosher W, Daniels K. Current contraceptive use in the United States, 2006. Natl Health Stat Report. 2009;(12):1-21.

10. Trussell J. Contraceptive failure in the United States. Contraception. 2011;83(5):397-404.

11. Westoff et al. (year). The Quick Start Method.

12. Audet MC, Moreau M, Koltun WD, et al. Transdermal contraceptive delivery system: a multicenter comparative efficacy and safety study versus oral contraceptives. Contraception. 2001;66(1):31-37.

13. Dieben TO, Bjerre R, Tønnes Pedersen A. Effect on sexual function of everyday use of a contraceptive vaginal ring: randomized controlled trial. Fertil Steril. 2002;78(3):562-568.

14. Zieman M, Guillebaud J, Weisberg E, et al. Contraceptive efficacy and cycle control with the Ortho Evra/Evra transdermal system: the analysis of pooled data. Fertil Steril. 2002;77(2 Suppl 2):S13-S18.

15. Fraser IS, Dennerstein L, Allen BJ, et al. Depot medroxyprogesterone acetate and menstrual disturbance in perimenopausal women. Aust N Z J Obstet Gynaecol. 1985;25(3):227-231.

16. Schwallie PC, Assenzo JR. Contraceptive use of depot-medroxyprogesterone acetate: a critical review. Contraception. 1974;10(2):111-135.

17. Speroff L, Darney PD. A Clinical Guide for Contraception. 4th ed. Baltimore: Williams & Wilkins; 2001.

18. Harel Z. Effects of hormonal contraception on mood. Am J Obstet Gynecol. 2002;186(5 Suppl):S41-S47.

19. Rosenberg MJ, Meyers A, Roy V. Efficacy of the male condom in first acts of vaginal intercourse. Sex Transm Dis. 2001;28(6):335-339.

20. Trussell J, Portman D, Koopman EH, et al. Contraceptive failure rates for the pill, patch, and ring. Contraception. 2011;83(1):3-11.

21. Lidegaard O, Lokkegaard E, Jensen A, et al. Hormonal contraception and risk of venous thromboembolism: national follow-up study. BMJ. 2009;339:b2890.

22. Dinger J, Heinemann K, Kühl-Habich D, et al. The safety profile of a drospirenone-containing oral contraceptive: results from the European Active Surveillance Study on Oral Contraceptives (EURAS-OC). Contraception. 2007;75(5):344-354.

23. Gallo MF, Lopez LM, Grimes DA, et al. Combination oral contraceptives for contraception. Cochrane Database Syst Rev. 2011;(10):CD004992.

24. Cromer BA, Schmelzer J, Blair JM, et al. Depot medroxyprogesterone acetate versus oral contraceptives in adolescents: a 2-year prospective study of bone mineral density. J Pediatr Adolesc Gynecol. 1996;9(1):9-14.

25. Cundy T, Evans J, Roberts H, et al. Bone density in women receiving depot medroxyprogesterone acetate for contraception. BMJ. 1991;303(6805):13-16.

26. Jain J, Jakimiuk AJ, Bode FR, et al. Both oral and transdermal administration of ethinyl estradiol/norelgestromin result in similar increases in suppression of bone turnover. Contraception. 2007;76(2):92-98.

27. Berenson AB, Radecki CM, Grady JJ, et al. A prospective study of the effect of depot medroxyprogesterone acetate on bone mineral density in adolescents. Obstet Gynecol. 2008;111(5):1079-1086.

28. Bahamondes L, Espejo-Arce X, Monteiro I, et al. Acceptability and side effects of the levonorgestrel-releasing intrauterine system and the copper IUD in Brazilian women. Contraception. 2001;64(6):341-344.

29. Andersson K, Odlind V, Rybo G. Levonorgestrel-releasing and copper-releasing (Nova T) IUDs during five years of use: a comparative randomized clinical trial. Contraception. 1994;49(1):56-72.

30. Peterson HB, Xia Z, Hughes JM, et al. The risk of pregnancy after tubal sterilization: findings from the U.S. Collaborative Review of Sterilization. Am J Obstet Gynecol. 1996;174(4):1161-1168.

31. Shoupe et al. reported 66.3% of the users had “irregular cycles” during the first year and the rate dropped to 37.5% during the fifth year