Noncontraceptive Benefits of 17β-Estradiol COCs During Adolescence

4

George K. Creatsas and Maria Creatsas

Adolescent sexuality and reproductive health care is a discussion topic with issues related to adolescent pregnancies, termination of undesired pregnancies, contraception for adolescents, prevention and treatment of sexually transmitted diseases, and other gynecological pathologies [1–4].

In the USA, adolescent pregnancy accounts for more than 750,000 pregnancies per year, of which 82 % are unintended. A large number (64 %) also occur among young women 20–24 years old [5].

The failure rate of combined oral contraceptives (COCs) during adolescence is estimated between 5 % and 15 %. During the last years, an effort was undertaken to reduce the dose of ethinyl estradiol (EE) in COCs. However, the decrease of the dose had negative effect on the physiology of the menstrual cycle. On the other hand, early attempts to develop 17β-estradiol (E_2)-based COCs (E_2–COCs) accompanied with prolonged or heavy uterine bleeding and discontinuation rates [6–8].

In addition, it was found that EE was responsible for several side effects of COCs, related to the liver function, venous thromboembolism and hypertension. Thus, research was directed to the development of new COCs with E_2 and new progestins as the dienogest, drospirenone, nomegestrol acetate, and other components. An emphasis was given to the development of new progestins with both progestagenic and antiandrogenic efficacy [9, 10].

Furthermore, the noncontraceptive benefits of the new-generation E_2–COCs were studied in combination with the favorable effects of the progestins as: the improvement of acne, the regulation of the menstrual cycle, the prevention of endometrial and ovarian cancers, the prevention from benign ovarian cysts, the management of endometriosis, the severity of pelvic inflammatory diseases (PID),

G.K. Creatsas (✉) • M. Creatsas
2nd Department of Obstetrics and Gynecology, University of Athens-Aretaieio Hospital, 76 VAS SOFIAS ave, Athens 11528, Greece
e-mail: geocre@aretaieio.uoa.gr

A.R. Genazzani, M. Brincat (eds.), *Frontiers in Gynecological Endocrinology: Volume 1: From Symptoms to Therapies*, ISGE Series
DOI 10.1007/978-3-319-03494-2_4,

Table 4.1 No contraceptive benefits of E_2–COCs

Regulation of menstrual cycle
Less menstrual withdrawal, breakthrough bleeding, and spotting
Management of DUB, dysmenorrhea, and premenstrual tension syndrome (PMS)
Management of endometriosis
Improvement of acne and PCO
Prevention from benign ovarian cysts
Decrease of the incidence of endometrial, ovarian, and colorectal cancer
Decrease of the severity of PID
Prevention of bone mass
Beneficial effect on the:
Liver function
Lipid and carbohydrate metabolism
Hemostasis and inflammation markers
Thyroid function
Adrenal indices and SHBG

the protection of bone mass, the management of the polycystic ovarian disease (PCO), as well as the beneficial effect on the liver function and the lipid profile (Table 4.1) [8, 11].

Regarding the regulation of the menstrual period (MP), a significantly shorter MP was succeeded as well as less menstrual, withdrawal, breakthrough bleeding, and spotting. Furthermore, the new E_2–COCs have been used for the management of dysfunctional uterine bleeding (DUB) and dysmenorrhea, especially in cases with endometriosis [12].

Beneficial effects have been reported on the endocrine—biochemical and haemostatic markers, on the thyroid function, the adrenal indices, the SHBG, the inflammation markers, as well as on the lipid and carbohydrate metabolism [13–16].

Furthermore, the E_2–COCs, as it was previously reported, are used for the management of the menstrual irregularities, dysmenorrhea, and PMS as well as for the improvement of the PCO clinical features.

Adolescents are usually unaware of the beneficial effects of COCs, and especially for the effects of the young generation pills. Thus, consultation on contraception should include franc explanation on the use and action of the pills as well as for their long-term beneficial effects [1, 2].

On the other hand, the COSs "negative effects" should be considered before treatment [17, 18]. The myths and misconceptions on the COCs use and especially the beneficial effects of the new-generation E_2–COCs, as these were very well presented, at the 12 European Congress of Contraception (Athens, 2012), are very much related to the COC's compliance. For this reason, proper consultation should be provided to young people and their families to avoid discontinuation and unwanted pregnancies[7].

References

1. Creatsas G (1995) Adolescent pregnancy in Europe. Int J Fertil 40(Suppl 2):80–84
2. Creatsas G (1997) Improving adolescent sexual behaviour: a tool for better fertility outcome and safe motherhood. Int J Gynecol Obstet 58(1):85–92
3. Creatsas G, Deligeoroglou E (2009) Pediatric, adolescent & young adult gynecology. In: Altchek A (ed) Contraception in adolescence. Wiley, Chichester
4. Creatsas G, Vekemans M, Horejsi J, Uzel R, Lauritzen C, Osler M, Athea N, Toublanc JE, Molnar A, Orley J, Bruni V, Rademakers J, Siegberg R, Widholm O, Stedman Y (1995) Adolescent sexuality in Europe: A multicentric study. Adolesc Pediatr Gynecol 8:59–63
5. Finer LB, Henslaw SK (2006) Disparities in the rates of unintended pregnancy in the United States, 1994 and 2001. Perspect Sex Reprod Health 38:90–96
6. Alsina JC (2010) After 50 years of ethinylestradiol, another oestrogen in combined in oral contraceptives. Eur J Contracept Reprod Health Care 15(1):1–3
7. Deligeorogluou E, Creatsas G (2012) Menstrual disorders. Endocr Dev 22:160–170
8. Kuhl H (1997) Ideal dose of ethinylestradiol. In: Elstein K (ed) Extragenital effects of oral contraceptives. Parthenon Publishing Group, New York, NY, pp 27–38
9. Hoffmann H, Moore C (1998) Approaches to the replacement of ethinylestradiol by natural 17 beta- estradiol in combined oral contraceptives. Exp Toxicol Pathol 50(4–6):458–464
10. Krattenmacher R (2000) Drospirenone: pharmacology and pharmacokinetics of a unique progestogen. Contraception 62(1):29–38
11. Lattakova M, Borovsky M, Payer J, Killinger Z (2009) Oral contraception usage in relation to bone mineral density and bone turnover in adolescent girls. Eur J Contracept Reprod Health Care 14(3):207–214
12. Mansour D, Verhoeven C, Sommer W, Weisberg E, Taneepanichskul S, Melis CB, Sundstrom-Poromaa I, Korver T (2011) Efficacy and tolerability of a monophasic combined oral contraceptive containing nomegestrol acetate and 17β- oestradiol in a 24/4 regimen, in comparison to an oral contraceptive containing ethinylestradiol and drospirenone in a 21/7 regimen. Eur J Contracept Reprod Health Care 16(6):430–443
13. Agren UM, Antilla M, Macnpaa-Liukko K, Rantala ML, Rautiainen H, Sommer WF, Mommers E (2011) Effects of a monophasic combined oral contraceptive containing nomegestrol acetate and 17-b oestradiol in comparison to one containing levonorgestrel and ethinylestradiol on markers of endocrine function. Eur J Contracept Reprod Health Care 16 (6):458–467
14. Agren UM, Antilla M, Macnpaa-Liukko K, Rantala ML, Rautiainen H, Sommer WF, Mommers E (2011) Effects of a monophasic combined oral contraceptive containing nomegestrol acetate and 17-b oestradiol with one containing levonorgestrel and ethinylestradiol on haemostasis, lipids and carbohydrate metabolism. Eur J Contracept Reprod Health Care 16(6):444–457
15. American College of Obstetricians and Gynecologists, Women's Health Care Physicians (2010) Noncontraceptive uses of hormonal contraceptives. Obstet Gynecol 115(1):206–218
16. Creatsas G, Kontopoulou-Griva I, Deligeoroglou E, Tsangaris A, Kallipolitis G, Milingos S, Michalas S (1997) Effects of two combined monophasic and triphasic ethinylestradiol/ gestodene oral contraceptives on natural inhibitors and other hemostatic variables. Eur J Contracept Reprod Health Care 2:31–38
17. Haider Z, D'Souza R (2009) Non-contraceptive benefits and risks of contraception. Best Pract Res Clin Obstet Gynaecol 23:249–262
18. Westhoff C, Kaunitz A, Korver T, Sommer W, Bahamondes L, Darney P, Verhoeven C (2012) Efficacy, safety and tolerability of a monophasic oral contraceptive containing nomegestrol acetate and 17β – estradiol. Obstet Gynecol 119(5):989