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Case Series

Ultra-low dose oral contraceptives: a game changer in managing puberty menorrhagia-a case series

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ABSTRACT

Puberty menorrhagia, characterized by excessive menstrual bleeding during adolescence, often results from an immature hypothalamic-pituitary-ovarian axis. Effective management is crucial, yet compliance with traditional combined oral contraceptives (COCs) is often low due to side effects like nausea and breakthrough bleeding. This case series investigates the use of ultra-low dose COCs (ULDCOCs) containing 15µg ethinyl oestradiol and 60µg gestodene in five adolescents aged 13-16 years with puberty menorrhagia. The patients presented with prolonged bleeding, irregular cycles, and underlying conditions like polycystic ovarian syndrome (PCOS) and hypothyroidism. Treatment with ULDCOCs resulted in significant improvements: menstrual bleeding reduced, Pictorial Blood Assessment Chart (PBAC) scores dropped from a mean of 103 to 40, and haemoglobin levels improved. Common side effects included mild nausea, breast tenderness, and occasional breakthrough bleeding, which decreased over time. This series suggests that ULDCOCs provide effective cycle regulation and symptom relief with a favourable safety profile in adolescents with puberty menorrhagia. The reduced estrogen content offers fewer side effects while maintaining efficacy. Larger studies are warranted to confirm these findings and establish ULDCOCs as a standard treatment for adolescence-related menstrual disorders.

Keywords: Puberty menorrhagia, COCPs, Puberty, Hormonal contraceptive, Gestodene

INTRODUCTION

A child's body goes through physical and hormonal changes during puberty, which prepares them for sexual maturity and the potential to procreate. Though the exact age range varies greatly, it starts when a female is 8 to 13 years old and a boy is 9 to 14 years old. Growth spurts, secondary sexual traits and major hormonal fluctuations fueled by estrogen and testosterone are all involved. As a person moves from childhood to adolescent, emotional, social, and cognitive changes coincide with these physical changes.[1] During the initial post menarcheal years, irregular and anovulatory cycles are typical. They may be a normal, temporary stage of ovarian hyperandrogenism, but they can also be the result of hormonal disorders affecting the pituitary, adrenal glands, or ovaries. Amenorrhea could indicate an issue with the hypothalamus, pituitary, or ovaries, or it could indicate late puberty.[2] Normal range of cycle is 24-38 days according to FIGO update.[3] Puberty menorrhagia is defined as prolonged, severe bleeding lasting more than equal to 8 days that happens between the age of menarche and the age of 193. It affects 50% of the adolescent.[3] Among the most commonly mentioned reasons of puberty menorrhagia are immature hypothalamus pituitary axis (HPO) causing anovulatory cycles (80%), clotting abnormalities, polycystic ovarian disease, and hypothyroidism. When irregular uterine bleeding begins after a period of regular menstruation rather than at menarche, the prognosis is typically better.[4]

A proper treatment plan is crucial when dealing with severe and frequent menstrual bleeding. Given the transitional nature of the teenage age group, clinical management should involve both obstetricians and paediatricians. Management typically involves antifibrinolytics, haematinics, and hormones like combined oral contraceptives (COC) and Progestins.

The best course of action is to utilize oral contraceptive tablets, as they increase sex hormone-binding globulin, which inactivates testosterone, and inhibit LH, lowering circulating testosterone levels. Cyclic medroxyprogesterone acetate (10 mg orally for 10 days each month) is another option for treating irregular bleeding; however, it does not address androgenic symptoms related to polycystic ovaries.

However, there is no proper guidelines on the treatment of puberty menorrhagia. The compliance to COC by patients is usually low, especially by young population.[5] This is due to the side effects ranging from headache, breakthrough bleeding, bloating to major effects like venous thromboembolism. However, the side effects are due to presence of estrogen content, whose dose can be altered for effective reduction of these effects. The lowest amount of estrogen (15 µg) is found in the latest ultra-low-dose COCs, which are permitted in India and Eastern nations6. Nevertheless, the low estrogen concentrations utilized in contemporary low-and ultra-low-dose COCs are insufficient to consistently have an antiovulatory impact. As a result, attention has turned to the progestin component, which accounts for most of the COCs' antiovulatory actions.[7]

Ultra-low-dose combined oral contraceptives (ULDCOC) with 15µg estrogen and gestodene, has high progestational efficacy and lower androgenic effects; effective in regulating menstrual cycles and reducing bleeding episodes, supported by their favourable pharmacokinetic profile. This case series investigates the effectiveness and safety of ultra-low dose OCPs in treating puberty menorrhagia.

CASE SERIES

All patients in this series were prescribed a 24/4 regimen of ultra-low dose oral contraceptive pills containing 15 micrograms of ethinyl estradiol (EE) and 60 micrograms of gestodene for three cycles, following an evaluation to rule out contraindications.

Case 1

A 15-year-old patient with a BMI of 27 kg/m² presented with menometrorrhagia, experiencing 15–60-day cycles with bleeding lasting 60-90 days for one year since menarche. She reported severe cramps, fatigue, and weight gain, with a pictorial blood assessment chart (PBAC) score of 80. Initial investigations revealed an elevated thyroid-stimulating hormone (TSH) level of 6.5, indicating hypothyroidism. The patient was started on Thyronorm 12.5 mcg to manage her hypothyroidism. After two months of thyroid treatment, the patient began using an ULDCOC to address menstrual irregularities. Following the initiation, the patient experienced a significant reduction in menstrual bleeding, with a PBAC score dropping to 25, and an improvement in fatigue and dysmenorrhea. Despite missing two pills in the first month, she did not experience breakthrough bleeding. However, she reported persistent breast tenderness for the first two months of ULDCOC use.

Case 2

A 13-year-old patient with a BMI of 23 kg/m² presented with menorrhagia, characterized by bleeding every 15-20 days with a pictorial blood assessment chart (PBAC) score of 105 since menarche six months ago. Investigations, including a complete blood count (CBC), coagulation profile, thyroid function tests, and a pelvic ultrasound, were all normal.

Initially, the patient was treated with parenteral antifibrinolytics and advised lifestyle modifications. After three months of ULDCOC, the patient reported breakthrough bleeding on day 21 of the first month of treatment. Despite this, there was a notable improvement, with menstrual bleeding now occurring every 3-4 days per 30-day cycle and a reduction in the PBAC score to 30.

Case 3

A 16-year-old patient with a BMI of 25 kg/m² presented with menometrorrhagia, experiencing bleeding for 12 days with a cycle length of 60-90 days and a pictorial blood assessment chart score of 95. The patient also exhibited signs of hyperandrogenism, including acne and acanthosis. Ultrasound investigations revealed polycystic ovarian morphology. To manage the acute bleeding, the patient was initially treated with medroxyprogesterone 10 mg twice daily for 21 days. Following this, ULDCOC was started on the second day of the menstrual cycle for a duration of three months. The outcome included withdrawal bleeding lasting 3-4 days, with a reduction in the PBAC score to 40. No complications were reported.

Case 4

A 14-year-old patient with a BMI of 18 kg/m² presented with menometrorrhagia, characterized by bleeding every 8 days with a cycle length of 60 days for the past 6 months and a pictorial blood assessment chart (PBAC) score of 115. The patient also experienced spasmodic dysmenorrhea but had no signs of hyperandrogenism. Ultrasound investigations revealed polycystic ovarian morphology. The initial treatment included parenteral antifibrinolytics and haematinics to manage acute bleeding. Following this, the patient was started on ultra-low-dose combined oral contraceptives (ULDCOCs). The treatment led to withdrawal bleeding lasting 4 days, with a

reduction in the PBAC score to 50. However, the patient reported complications of nausea and bloating during the course of treatment.

Case 5

A 14-year-old patient with a BMI of 20 kg/m² presented with menorrhagia, experiencing bleeding for 8-10 days every 30-35 days for the past 8 months, and had a pictorial blood assessment chart (PBAC) score of 120. The patient also reported easy fatigability and pallor. Investigations revealed iron deficiency anaemia with a haemoglobin level of 7.8 g/dl. The initial treatment included hematinics and parenteral antifibrinolytics to address the anemia and control acute bleeding. Following this, the patient was started on ultra-low-dose combined oral contraceptives (ULDCOCs) for menstrual regulation.

At the 4-month follow-up, haemoglobin had improved to 11.5 g/dl. The patient experienced normal withdrawal cycles and had one pill-free cycle lasting 5 days, with a reduced PBAC score of 55. However, the patient reported nausea as a side effect of the treatment.

Outcomes

Table 1: Baseline characteristics of patients treated with ultra-low dose OCP in puberty menorrhagia.

Parameters	
Mean age	14.4
Mean BMI	22.6

Table 2: Comparative analysis of clinical parameters before and after treatment with ULDOCP.

Parameters	Before treatment	After treatment
Mean duration of bleeding	10.2	4
Mean PBAC score	103	40
Mean haemoglobin	9.2	11.5

Table 3: Distribution of underlying causes in patients treated.

Cause	No. of cases
Anovulatory DUB	2
PCOS	2
Hypothyroid	1

Table 4: Occurrence of side effects.

Common side effects	No. of cases
Break through bleeding	1
Breast tenderness	1
Nausea	2
Bloating	1

DISCUSSION

In this case series, we explored the efficacy and safety of ultra-low-dose combined oral contraceptives (ULDCOCs) in managing puberty menorrhagia. Early generation COCs were linked to side effects like irregular bleeding, nausea, weight gain, and thromboembolism. Advancements in COCs have focused on reducing estrogen doses, optimizing progestin types, and adjusting regimens to enhance efficacy and minimize risks. These improvements make modern COCs safer and more suitable for managing conditions like puberty menorrhagia. The estrogen content of modern COC pills is 20 µg (low-dose COC) or 15 µg (ultra-low-dose COC), compared to up to 30 µg in older generations of COCs.

The mean age in our series is 14. Kulkarni et al showed most of their participants with puberty menorrhagia were 13 years and Roychowdhury et al9 showed 52% of their participants belong to 17-19 years had menorrhagia.[8]

Roychowdhury et al showed most of it was caused by DUB (61%) followed by 15 % haematological causes and 10.5% PCOS.[9] Among the AUB due to multiple etiologies, 7.6% responded to third gen OCP alone, 21 % to Tranexamic acid plus ocp and 17.1 % with progesterones. Shiksha Joshi et al showed (78%) having menorrhagia due to anovulatory cycles,14% patients had PCOD and 8% patients had hypothyroidism.[10]

Gestodene (GSD) is a third generational progestin similar to desogestrol and norgestimate, minimizes androgenic effects compared to levonorgestrel, altering its pharmacokinetics.[11] The rate of metabolic clearance of estodene is decreased, and its concentration in the circulation is higher. It exhibits a higher progestational to androgenic effect ratio than levonorgestrel and has a longer half-life with greater sex-hormone binding globulin affinity hence helping in PCOS girls.

It was demonstrated that GSD had reduced androgenicity that was similar to 3-keto-desogestre.[12] Ahuja et al demonstrated that the 24/4 regimen, compared to 21/7, is associated with reduced fluctuations in 17-β-estrodiol levels and improved control of premenstrual symptoms.[11] Gestodene combination OCP had good cycle control as shown by the MINESSE trial which showed 72% of normal cycle with overall breakthrough bleeding in 21% which decreased from cycle 1 to cycle 19.[13]

After four to six months, it has been proposed that using ULDOCP restores the regular menstrual cycle.[13,14,15] A study by Sullivan H et al has demonstrated that using COC containing gestodene/EE (60/15 µg) throughout three treatment cycles resulted in less changes in hormones levels when using the 24/4 regimen as opposed to the 21/7 regimen.[16] Few studies tried to study the efficacy of this pill for contraception.[10-11] However none has been studied for abnormal uterine bleeding. Normalized menstrual

cycles and significant reduction in bleeding were observed in our case series while common side effects included nausea, breakthrough bleeding, breast tenderness, and bloating were reported

The effect on hemostasis was studied by Norris LA et al that showed the effect of estrogen and progesterone dose comparing 30 mcg EE/150 mcg desogestrel, 20 mcg EE/150 mcg desogestrel, 30 mcg EE/75 micrograms gestodene. Results indicated that lower estrogen doses (20 µg) had less effect on coagulation factors (VII and X) which can be modified by the progestogen, suggesting a safer option compared to higher doses (30 µg).[16]

A study by Suresh S et al compared desogestrol containing pill, which is of similar group as gestodene, with levenogestrol containing pill and found that over the course of four months, mean PBAC scores decreased by 79.87% when combination oral contraceptives containing desogestrel were used, as opposed to 74.46% when levonorgestrel was used. The levonorgestrel group experienced more side effects than the desogestrel group, including headaches, acne, and weight gain.[17]

Jaithitivi et al found that ULDOCP achieved 86% normal cycles with a 2.1% incidence of breakthrough bleeding.[18] Side effects included headache, bloating, breast tenderness, and vomiting, which decreased with continued use. Comparing ULDCOCs to previous COCs, a lower risk of side effects is associated with good menstrual regulation, making them a of potential use in treatment of puberty menorrhagia. Given the favourable safety profile and ease of compliance, ULDCOCs can be considered a valuable treatment option offer a promising treatment option for young people with menstrual bleeding as well as for other uses like contraception, simple ovarian cysts. To validate the long-term safety and effectiveness of ultra-low-dose combination oral contraceptives (ULDCOCs) in a larger cohort of teenagers with puberty menorrhagia, more research is required.

CONCLUSION

Ultra-low dose OCPs could be an effective and safe option for the management of puberty menorrhagia. They significantly reduce menstrual blood loss and improve haemoglobin levels with minimal side effects, offering a promising alternative to standard hormonal therapies. Larger-scale research is needed to validate these results and determine long-term safety and efficacy profiles, particularly for the adolescent population and AUB, the effects of which have not yet been thoroughly investigated.

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