

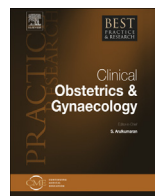


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### Obesity and menstrual disorders



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Obese women often present with oligomenorrhoea, amenorrhoea or irregular periods. The association between obesity and heavy menstrual bleeding is not well documented and data on its prevalence are limited. While the investigation protocols should be the same as for women of normal weight, particular focus is required to rule out endometrial hyperplasia in obese women.

The treatment modalities of menstrual disorders for obese women will be, in principle, similar to those of normal weight. However, therapeutic outcomes in terms of effectiveness and adverse outcomes need special consideration when dealing with women with a high body mass index (BMI).

Here, different treatment strategies are reviewed paying particular attention to the effect of weight on their efficacy and the challenges of providing each treatment option. This chapter aims to review the current literature and address areas where further evidence is needed, which will subsequently influence clinical practice.

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#### Introduction

Obesity is a growing public health concern as it is associated with many co-morbidities. Furthermore, with a rising life expectancy and growing population, it is inevitable that diseases related to obesity will become more prevalent. Women who are obese suffer disorders of reproduction including infertility, polycystic ovarian syndrome (PCOS) and menstrual disorders [1,2]. These encompass a wide

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range of abnormalities in terms of amount of menstrual blood loss, duration of bleed, length and regularity of menstrual cycle. It may also include heavy menstrual bleeding (HMB), which is defined as excessive menstrual blood loss that interferes with a woman's physical, social, emotional or material quality of life [3]. It is well recognised that obese women with PCOS experience a higher frequency of menstrual cycle irregularities [4]. However, regardless of the presence of PCOS, obesity is an independent risk factor for several hormonal abnormalities, such as increased concentrations of testosterone and insulin, and reduced concentrations of sex hormone-binding globulin (SHBG) [5,6], which inevitably influence the menstrual cycle.

The age of onset of obesity and that of menstrual irregularities are significantly correlated [7]. These findings have been corroborated by Lake et al. [8], and showed that obesity in adolescence increased the risk of menstrual problems. These studies suggest that obesity does contribute to a significant proportion of menstrual disorders in young women.

The association between obesity and menstrual irregularity including oligomenorrhoea, amenorrhoea and irregular uterine bleeding is well documented. In addition, in many cases, menstrual irregularities are often associated with episodes of dysfunctional uterine bleeding. However, the effectiveness of different treatment modalities, particularly the hormonal ones, are often reported using a primary outcome in terms of suppression of ovulation and of failure (pregnancy rates); hence, direct evidence on cycle control and reduction in menstrual loss is not widely reported.

### **Prevalence of menstrual disorders in obese women**

It was reported that the prevalence of menstrual cycle irregularities was 8.4% in women who were 74% overweight, as opposed to 2.6% in women who were <20% overweight [9]. A further study documented that being 15% overweight was associated with a significantly higher chance of having a menstrual cycle longer than 43 days [10]. In a later study, the association between body fat distribution and menstrual cycle disturbances in 11,791 women was examined [11]. In that study, the relative risk (RR) of oligomenorrhoea in woman with upper body fat predominance was 3.15 ( $P < 0.001$ ) compared with women with lower body fat predominance [11].

Within the general population, the prevalence of HMB is difficult to estimate; a recent study of women aged 30–49 years consulting their general practitioner (GP) showed a rate of around 3% presenting with HMB [12]. No reference is made to the body mass index (BMI) of the women within this group. However, a study looking at menstrual disorders in the 1970s found HMB to be more prevalent in overweight women [9].

An American study of 25 teenagers undergoing bariatric surgery reviewed gynaecological symptoms in the cohort and found that 28% of the adolescents had HMB: a stark increase in the prevalence within the general population [13]. A cross-sectional study in Europe, looking at patient satisfaction with the Mirena intrauterine system (IUS), used BMI as an independent determinant of patient satisfaction. It found that women with a higher BMI tended towards less satisfaction with the Mirena IUS and had a longer time interval to achieve amenorrhoea [14]. From this study, it is extrapolated that women with a raised BMI were more likely to have heavier menstrual bleeding.

### **Pathophysiology**

#### *The effect of obesity on menarche and the menopause*

Several epidemiological studies have suggested that changes in body weight and composition are crucial in regulating pubertal development in women [15]. The relationship between obesity and reproductive disturbances, and most likely menstruation, appears to be stronger for early-onset obesity [16]. Leptin is a main product of body fat [17] and regulates the gonadotrophin surge, which initiates the development of pubertal stages [18]. Several studies have reported that the age of menarche generally occurs at a younger age in obese girls than in normal-weight girls [19].

Furthermore, data also suggest that the onset of ovarian failure and increased production of follicle-stimulating hormone (FSH) at menopause occurs several years earlier in obese than in normal-weight women [20].

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