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Clinical Guidelines

Contraceptive considerations in obese women

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Abstract

Contraceptive failure is the primary cause of unintended pregnancy in the United States. With obesity rates at epidemic proportions, any association between obesity and strategies that prevent undesired pregnancies constitutes a significant public health and economic concern. Unfortunately, the relationship between obesity and contraception has not been extensively studied. Evidence from several epidemiological studies suggests that obesity may increase failure of some hormonal contraceptives resulting in unplanned pregnancies. Obesity may make procedure-dependent contraceptive methods (i.e., sterilization and intrauterine devices) more technically challenging for the provider to perform. Hormonal contraceptives, on the whole, do not appear to adversely affect body weight and provide important noncontraceptive benefits (i.e., cancer protection). Some surgical interventions to treat bariatric issues may compromise the efficacy of orally dosed contraceptive methods. Overall, the Society of Family Planning strongly encourages the use of both hormonal and nonhormonal methods of contraception in obese women desiring pregnancy prevention with very few restrictions. Further studies are needed to determine the interrelationship between obesity and contraception. In addition, future contraceptive efficacy studies need to include women of differing BMIs to better reflect the population of women using these methods.

Keywords: Obesity; Body mass index (BMI); Body weight; Contraception; pregnancy prevention; Unplanned pregnancies; Pregnancy; Bariatric surgery; Contraceptive compliance; Sexual behavior

Background

The rate of obesity worldwide is at epidemic proportions with 1 billion and 300 million adults meeting the criteria for overweight and obese, respectively [1]. Currently, the obesity rate in Europe and the United States is approximately 30% and rising [1,2]. The prevalence of unintended pregnancy rivals that of obesity. Forty-nine percent of all pregnancies per year in the United States are unintended (3.1 million), and roughly half a million of these are related to oral contraceptive failures [3]. Obesity is known to affect the health of both present and future generations with higher rates of both maternal and fetal morbidity and mortality, and increased rates of obesity and diabetes in offspring [4–8]. Thus, any association between obesity and the ability to prevent pregnancies constitutes a significant public health and economic concern. Unfortunately, most contraceptive research has excluded women above 130% of ideal body weight, making it difficult to counsel these women regarding their risk for contraceptive failure [9].

Use of a safe and effective contraceptive method in women with chronic medical conditions, like obesity, is paramount since these women are at higher risk of pregnancy-related complications. In addition, many contraceptive methods may offer important noncontraceptive benefits for these women [10–13]. However, obese women are less likely to use contraception or to receive preventative health care services as compared to women with a normal BMI [14,15]. It is unclear whether this disparity is related to patient, provider or systems issues. In regard to contraceptive care, perhaps there is an assumption that fertility is impaired and contraception is unnecessary, other health issues supersede contraceptive counseling or there is a perception that contraception would be riskier than a pregnancy. However, it is essential that the risks of contraceptive use in obese women and the potential impact of obesity on contraceptive efficacy be compared to the health, financial and personal implications of an unplanned pregnancy. The use of contraception in obese women will always prevent more pregnancies than no contraception even in the event of impaired contraceptive effectiveness and is universally always less risky to these women than a pregnancy.

The inherent efficacy of hormonal contraception in obese users has not been well studied. The research is inconsistent

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and demonstrates either no difference between BMI categories or an increase in contraceptive failures in the obese group [16–28]. There are also significant limitations to most of the studies, the majority of which are retrospective and underpowered with self-reported weight or BMI, self-reported oral contraceptive use/type, and many use databases where unintended pregnancies ending in abortion are significantly underreported or not included [29]. Overall, self-reported weight or BMI in women is fairly accurate in that height is overreported and weight is underreported; objective measurements of weights and heights would then only strengthen the findings of positive studies [30–34]. Several of the studies were based in Europe where contraceptive effectiveness has been demonstrated to be higher and thus findings would be biased towards a null result [35]. Many of these studies were performed at a time where the prevalence of obesity and morbid obesity was less than currently exists. Most importantly, no studies address the potential, if any, biological mechanism for failure of hormonal contraception.

Obesity is defined based on body mass index (BMI), which is an indirect measure of body fat. BMI has been shown to correlate well to direct assessments of body fat [i.e., dual-energy X-ray absorptiometry, underwater weighing and air displacement plethysmography (BOD POD)] [36,37]. BMI is calculated by dividing weight in kilograms by height in meters squared. Although BMI is not a perfect indicator of body fat, it is reliable, inexpensive and easy to perform in a clinical setting. BMI categories are defined by The Centers for Disease Control and Prevention and The World Health Organization as [33,38,39]:

- Underweight <18.5 kg/m^2
- Normal 18.5–24.9 kg/m^2
- Overweight 25–29.9 kg/m^2
- Obese 30–39.9 kg/m^2 or Class I obesity 30–34.9 kg/m^2 and Class II obesity 35–39.9 kg/m^2
- Very obese ≥40 kg/m^2 or otherwise referred to as severe, extreme, morbid or Class III obesity

This document will review the current evidence regarding the interrelationship between contraception and obesity.

Clinical questions and recommendations

1. Are obese women at increased risk for pregnancy as compared to their normal BMI counterparts?

Abnormalities in metabolism and extremes in body weight can adversely affect the reproductive system. Obesity is a known risk factor for reduced fertility because of menstrual abnormalities, anovulation, polycystic ovarian disease and insulin resistance [40,41]. However, the majority of women, both thin and obese, ovulate on a regular basis and are at risk for pregnancy [40].

The rate of sexual activity and use of contraception also affect the risk of pregnancy. Many assume that obese women engage in less frequent sexual activity, making them at less risk of pregnancy. An analysis of the 2002 National Survey of Family Growth (NSFG) demonstrated no differences in sexual behaviors between BMI categories in sexually active reproductive-age women [42]. In regard to contraceptive use, an analysis of the Family Planning Module of the Behavioral Risk Factor Surveillance System (BRFSS; 7943 women) found that obese women were significantly less likely to use contraception as compared to normal BMI women [15]. It is unclear whether this disparity is due to patient, provider and/or systems issues. Of note, these obese women were also more likely to be older, Black, Hispanic, married, less educated and without health insurance.

Available information regarding female adolescent sexual activity based on weight differences is somewhat conflicting. A longitudinal study of 200 teens demonstrated that "thinner" girls dated more and thus had more opportunity for and higher frequency of petting and coital activity as compared to "heavier" girls [43]. A survey of 522 African-American female adolescents found that obese adolescents were more likely to have body image dissatisfaction and lower self-esteem issues. These factors were felt to lead to earlier coital debut (<14 years old), fear of abandonment when trying to negotiate condom use, less confidence to refuse an unsafe sexual encounter and higher rates of unprotected intercourse [44].

Based on these findings, obese adult and adolescent women appear to be at a similar or higher risk of pregnancy as compared to normal BMI women.

2. Does obesity affect oral contraceptive effectiveness?

Contraceptive effectiveness relies on medication compliance, sexual behavior (discussed above), fecundity and the inherent efficacy of the medication. Poor medication compliance has been blamed for the majority of oral contraceptive failures. Using an electronic device implanted in pill packages, researchers compared patient self-report and electronic data regarding compliance. Self-reported data significantly underestimated the number of pills missed [45]. However, obese women have never been demonstrated to be less compliant with medication than normal BMI women.

In general, the effect of obesity on drug pharmacokinetics is poorly understood. A study comparing the pharmacokinetics and hypothalamic-pituitary-ovarian activity of obese (BMI >30 mg/k^2) and normal (BMI <25 mg/k^2) BMI women using a 20-mcg ethinyl estradiol (EE) /100-mcg levonorgestrel oral contraceptive demonstrated that the obese group had a significantly longer levonorgestrel half-life (52.1±29.4 vs. 25.6±9.3 h, $p<.05$) which correlated with a lower maximum levonorgestrel serum level and a longer time to reach steady state (10 vs. 5 days) [46]. There were no significant differences in volume of drug distribution between the BMI groups. Consistent with these pharmacokinetic findings, more obese women demonstrated hormonal