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A Comprehensive Review of the Relationship between Junk Food, Obesity, Polycystic Ovary Syndrome (PCOS), and Menstruation

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Abstract:

This in-depth review research investigates the complex interactions between the consumption of junk food, obesity, Polycystic Ovary Syndrome (PCOS), and menstrual health. Understanding how these elements interact is essential for healthcare professionals, researchers, and anyone else attempting to address and handle these complex challenges as they increasingly have an impact on the overall health of women around the world.

The link between obesity and excessive junk food consumption. Junk food's excessive caloric density and subpar nutritional value contribute to weight gain, which creates the conditions for hormonal imbalances that have an impact on menstruation health.

PCOS is described as a prevalent endocrine illness that has been linked to ovarian cyst development, hormonal abnormalities, and insulin resistance. The review highlights the intricate relationships among PCOS, obesity, and irregular menstruation.

The discussion of clinical ramifications emphasises the necessity for a comprehensive strategy to deal with the related problems of junk food intake, overweight, women with PCOS, and irregular periods. The importance of customised therapies, such as dietary adjustments, weight control, and hormone modulation, in total care is discussed.

Keywords: food habit, menstrual irregularities, overweight, junk food.

Introduction:

Menstruation is a typical physiological event in women that shows her procreative potential. But this common occurrence is not without difficulty, and it frequently involves considerable discomfort and humiliation. Almost every woman will at some point in her life have some sort of menstrual issue. As many as 87% of women report having menstruation difficulties (Narayan et al.,2001). Menstrual abnormalities include amenorrhea, irregular periods, abnormal flow, dysmenorrhoea, and premenstrual symptoms, among others. The most prevalent gynaecological disorder in women, having a frequency of 60% to 93%, is dysmenorrhea (Campbell et al., 1997). Dysmenorrhoea is pain that is felt prior to or during menstruation that is limited to the lower abdomen, back, and thighs and that can range in severity from mild to severe. Every 28 to 35 days, women have their regular monthly cycle. During these 2-3 days, the period of menstruation lasting three to five days, with a 30 to 80 ml blood loss on average. Any variation in a menstrual cycle's typical length is considered irregular.A wide range of cyclic, recurring mental, emotional, and behavioural issues that begin in the late luteal stage of the menstrual cycle and terminate with the advent of menses are collectively referred to as "pre-menstrual syndrome". These signs and symptoms include gaining weight, headaches, exhaustion, anxiety, irritability, and mood swings (Dutta et al., 2010; Cronje et al., 2002).

The typical female menstrual cycle illustrates the intricate interactions between hormones like progesterone and oestrogen. (Dambhare et al.,2012). Any variation from the typical period is considered an abnormal menstrual cycle. Adolescent girls are more likely to experience menstrual cramps, Amenorrhea, Menstrual bleeding, Hypomenorrhea, Polymenorrhea, Oligomenorrhea, as well as premenstrual complications than other types of menstruation diseases. The term "dysmenorrhoea" refers to difficult days that may include excruciating menstrual cramps. (French et al.,2005).

Body mass index is a key factor in the regularity of the menstrual cycle. Therefore, it is crucial to provide adolescent girls with a nutritious and well-balanced diet in order to regulate their normal menstrual cycle and maintain a normal BMI (Singh et al.,2019). Numerous research has looked into the possibility that eating junk food can cause irregular menstruation. One of this research found that eating junk food, which is low in micronutrients, can result in irregular periods, premenstrual symptoms, and dysmenorrhea (Randhawa et al.,2016).

Role of PCOS:

It was discovered that 30% of Indian women have PCOS. Teenagers are the most vulnerable. PCOS is classified to be an oligogenic condition with a combination of hereditary and environmental factors that affects how the condition manifests in PCOS women in a variety of clinical and biochemical ways (Gautam et al., 2011). Diet, way of life, and physical exercise all have an impact on the health of women. Women with PCOS have increased LH/FSH ratios. Anovulation, clinical as well as laboratory hyperandrogenism (hirsutism, acne, alopecia), and polycystic ovaries are the three major variables linked to PCOS. Women with PCOS frequently develop issues such as resistance to insulin, weight gain, cardiovascular diseases, cancer,

infertility, miscarriage, preeclampsia, and gestational diabetes. The long- and short-term effects of PCOS place a growing demand on medical resources (Chaudhary et al., 2017).

Based on epidemiological research, 38–88% of women with PCOS are overweight or obese. (Jaacks et al., 2019). Even a modest weight decrease of 5% of the body's weight has been shown to considerably improve hyperandrogenism symptoms and ovulatory performance in women with PCOS(Kiddy et al., 1992;Holte et al., 1995)This reveals the connections between junk food consumption, obesity, PCOS, and numerous other gynecological disorders. Girls and women who are genetically predisposed to PCOS will experience its severe and common manifestations as an obesity-related comorbidity (Bhushan et al., 2017). Therefore, it is undeniable that obesity significantly contributes to the onset and ongoing management of PCOS and affects how severe the condition's endocrine and clinical symptoms are in many women who have it (Taponen et al., 2003).

The primary PCOS symptom, hyperandrogenism, is commonly seen in female patients. Androstenedione, a hormone known as sulphate (DHEAS), and dehydroepiandrosterone (DHEA) are three different androgens that are most commonly expressed in excess and elevated in 60% of females. First-degree family members have a higher likelihood of having PCOS in a family group. Due to its peri-pubertal start, PCOS is categorised as a form of autosomal dominant genetic disorder (Crespo et al., 2018).

Role of Obesity:

Excessive body fat deposition, which increases the risk of these issues, is referred to as obesity. Body mass index (BMI), which is based on weight, height, and age, is used to identify metabolic disorders associated with obesity. There is a substantial correlation between an elevated BMI and women's metabolic processes and gynaecological disorders, including PCOS, excessive uterine bleeding (AUB), infertility, and pregnancy failure (Douchi et al., 2002).

Obesity is unquestionably among the most significant public health challenges of our day. A recent modelling study conducted in the United States revealed that, astonishingly, by 2030, somewhere in the range of 55 to 60 percent of youngsters today will be obese (Ward et al., 2017).

The key component of PCOS is obesity. Women with PCOS have an overabundance of androgens, which can increase subcutaneous and visceral fat levels. The abnormal regulation of appetite is a result of androgens. Women with PCOS have dysregulated ghrelin release, an appetite-regulating hormone, as well as decreased synthesis of the digestive satiety peptide cholecystokinin. Obesity is more common in PCOS women due to their elevated levels (Dinka et al.,2015;Susan et al., 2007).

Being overweight is becoming a more serious health concern because of its numerous co-morbidities. Moreover, it is likely that increased lifespans and population expansion would contribute to a rise in the prevalence of obesity-related disorders. Menstrual abnormalities, PCOS, and infertility are among the reproductive problems that obese women face (Harlass et

al.,1984; Siiteri et al.,1987). These encompass a broad spectrum of anomalies concerning the volume, duration, regularity, and bleeding during menstruation. Prolonged bleeding, also known as excessive blood loss from menstruation, can have a detrimental effect on a woman's social, physical, psychological, or material state of life (Yoo et al., 2006). It is well known that irregular menstrual periods occur more frequently in obese women with PCOS (Schindler et al., 2009).

Role of Diet:

Diet is undoubtedly one of the major contributing factors of overweight and obesity. A transformation in eating habits has led to pleasant, practical, and attractive junk food replacing nutrient-dense meals. Junk food is characterized by high calorie content, oil, sugar, salt, especially fat content but little nutritional value. Junk food provides poor nutrition since it has an excessive sugar, saturated fat, or sodium content per kcal (Anderson et al., 2005).

Teenagers frequently eat at fast food establishments. According to national statistics, approximately 40% of teenagers in high school say they often eat at fast food establishments. (Bowman et al., 2004). In the late 1970s, children and adolescents consumed only 2% of their total calories from fast food; by the mid-1990s, that percentage had risen to 10% (Guthrie et al., 2002). There doesn't seem to be a slowdown in the trend of fast food consumption due to the prevalence of fast food restaurants near schools (Austin et al., 2005; Zenk et al., 2008). Studies show that more than one-third of Americans regularly eat junk food (Bauer et al., 2009).

In a PAN India study of 13,274 kids between the ages of 9 and 14, the Centre for Science and Environment (CSE) found that 93% of the kids drank packaged sweetened beverages more than three times a week and 68% of them ate packaged meals at least thrice a day. Approximately 25% of students in school consume heavily-processed fast food items such as pizza and hamburgers, which are high in sugar, salt, and fat, on numerous days each week (Bhushan et al., 2017).

Because junk food is low in micronutrients including vitamin B6, as well as calcium, magnesium, and potassium, it might lead to premenstrual symptoms (Rupavani et al., 2013). Further research by J.L. Nirmala, R.L. Jaya Vani, P. Nivedhana Aarthi, P. Alaganandam, and N. Vanajakshi found a strong correlation between frequent junk food consumption and irregular menstrual periods, abnormal flow, dysmenorrhea, and PMS (Nirmala et al., 2014).Accordingly, there was a strong correlation between eating fast food and dysmenorrhea (Fujiwara et al., 2009). Teenage college students' menstrual health could be improved by consuming less junk food and promoting healthy eating habits (Lakshmi et al., 2015).

Overweight and obesity rates have skyrocketed throughout the past few decades, turning becoming a global health epidemic throughout most of the world (Mancino and Kinsey, 2008;LaCaille et al., 2011; Allom and Mullan, 2014). Over a ten-year period, excessive intake of junk foods in India increased the prevalence of overweight among children who are in school from 9.7% to 13.9% (Ranjani et al., 2016).

It is commonly known that obese women having PCOS have more frequent abnormalities in their menstrual cycles (Schindler et al., 2009). But even without PCOS, obesity raises the

possibility of certain hormonal imbalances, such as high insulin and testosterone levels and low sexual hormone-binding globulin, or SHBG, levels (Cheung et al., 2001 ; Chittenden et al., 2009). The menstrual cycle is inevitably impacted by them. Obesity and the age at which irregular menstruation first occurs are strongly correlated (Essah et al., 2006).

It was discovered that women weighing over 74% overweight had an 8.4% prevalence of abnormal menstrual periods, whereas women who seemed under 20% overweight had a 2.6% prevalence (Essah et al., 2006). According to another study, having a cycle of menstruation that lasts higher than 43 days is substantially more likely when a person is 15% overweight (Trussell et al., 2009). In a subsequent investigation, 11,791 women's menstrual cycle abnormalities and body fat distribution were compared. (Hall et al., 2012).

Conclusion:

This thorough analysis highlights the complex interactions between the use of junk food, obesity, Polycystic Ovary Syndrome (PCOS), and menstrual health. The research made available emphasizes the urgent need for a comprehensive strategy in addressing these interrelated issues in order to enhance reproductive health outcomes. The public and medical professionals can collaborate to improve menstruation health and general wellbeing by understanding the intricate web of relationships among these variables and encouraging healthier lifestyle choices. Our knowledge of this complicated relationship will continue to be improved by additional study, which will also help to direct more efficient treatments.

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