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Male Infertility and its Possible Relationship with Eating Habits

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ABSTRACT

Background: Infertility affects 10 % of the global population, with 30 % of cases attributable to male factors. Chronic diseases (diabetes, hypertension), stress, obesity, malnutrition, and inadequate lifestyles contribute to its development. Despite its psychosocial impact, the relationship between nutrition and male infertility remains insufficiently studied, with limited focus on specific dietary habits.

Objective: To analyze the influence of dietary habits on male fertility, emphasizing the impact of nutritional balance on semen quality.

Development: Evidence shows that both excess (obesity) and deficiency (extreme underweight) of body weight alter the hypothalamic-pituitary-gonadal axis, reducing testosterone and sperm quality. Obesity induces hypogonadism, oxidative stress, and erectile dysfunction, while inadequate dietary patterns (high intake of saturated fats, trans fatty acids, and sugars) impair seminal parameters. Conversely, balanced diets (e.g., Mediterranean) with adequate antioxidants (vitamins C, E), folic acid, zinc, and selenium improve sperm motility and concentration. The beneficial role of plant proteins, skim dairy, and unsaturated fatty acids (olive oil) is highlighted, alongside avoiding processed foods, tobacco, and alcohol.

Conclusions: A balanced diet and healthy lifestyle significantly improve semen quality. Robust scientific research is needed to generate evidence on specific diets or foods influencing male fertility, an underexplored area.

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Introduction

Addressing infertility involves overcoming barriers often reinforced by taboos. It is a situation that affected families and individuals tend to conceal. Infertility psychologically impacts couples, with repercussions extending to their relatives. It is not uncommon for couples with stable intimate relationships for over a year without contraceptive use to fail to achieve pregnancy, meeting the World Health Organization (WHO) definition of an infertile couple [1].

One in four couples seeking conception is affected; approximately 10 % of the global population suffers from infertility. In developed countries, nearly 25 % of couples fail to achieve pregnancy after 12 months of attempts [2]. Despite its consequences, this topic remains underdiscussed and frequently ignored [3].

Infertility is attributable to female factors in 30 % of cases, male factors in 30 %, mixed causes in 25 %, and unknown origins in 15 % [4]. Predisposing factors include sexually transmitted infections, stress, chronic diseases (diabetes, hypertension, hypothyroidism), inadequate lifestyles (obesity, addictions), and aging [5].

The relationship between fertility and nutrition is insufficiently documented. Poor eating habits excess refined sugars, fats, or absence of essential nutrients can lead to overweight, obesity, or extreme underweight. Malnutrition due to excess or deficiency negatively affects fertility in both sexes. Both extremes compromise conception by altering hormonal systems and reproductive organs [6].

Couples planning pregnancy should follow a balanced diet [7]. Literature primarily addresses female factors, with limited focus on male factors due to social pressures in a still male-dominated society. This article aims to explore the relationship between male fertility and dietary habits.

Development

Body fat is necessary for reproductive hormone production, but its excess in women elevates estrogen, causing irregular cycles and hindering ovulation. In men, overweight and obesity alongside high insulin levels reduce testosterone, affecting sperm production. Additionally, excess abdominal fat increases aromatase, an enzyme converting testosterone to estrogen, further impairing spermatogenesis [8].

In women, insufficient weight compromises pituitary hormones (FSH and LH), which regulate ovulation cycles, halting ovulation and menstruation (amenorrhea). In men, although less studied, underweight reduces sperm quality and quantity [9].

Male obesity affects fertility multifactorially [8]. Unhealthy dietary patterns currently prevail: high consumption of saturated fats, trans fatty acids, and simple sugars, coupled with low antioxidant intake (fruits, vegetables) [10].

Obesity disrupts the hypothalamic-pituitary-gonadal axis, causing hypogonadism, increased testicular temperature, spermatogenesis alterations, reduced sperm quality, and vascular erectile dysfunction [8]. This weight excess lowers serum testosterone and estradiol, affecting spermatogenesis and erection.

Overnutrition often coexists with metabolic disorders (metabolic syndrome, hyperlipidemia, proinflammatory states), reducing fertility [8]. Overweight or obese men exhibit lower sperm quality and reduced embryonic implantation rates [11,12]. Conversely, low body fat implies insufficient energy for fertility, causing hormonal alterations that reduce sperm viability and libido.

A healthy diet maintains an adequate Body Mass Index (BMI), promoting sperm production, sexual development, and secondary sexual characteristics [13]. Moderating alcohol and caffeine, while avoiding tobacco, is recommended. Dietary patterns to improve fertility include: balanced macronutrients, carbohydrates, fiber, plant protein, and healthy fats. Essential nutrients include folic acid, vitamins B12, D, A, C, E, and minerals (calcium, iron, zinc, selenium, iodine) [9]. Diets should be personalized.

A diet rich in plant proteins (whole grains, legumes) combined with exercise reduces diabetes risk, improves insulin resistance, and maintains healthy weight key factors for fertility [14,15]. The Mediterranean diet is highly recommended, prioritizing olive oil, whole grains, fruits, vegetables, nuts, fish, and legumes [16]. Dairy products are negatively associated with male fertility, except skim dairy, which improves sperm concentration and motility [17]. Oxidative stress (imbalance between free radicals and antioxidants) damages cells, affecting sperm quality and fertilizing capacity [18].

Male malnutrition (excess or deficiency) affects fertility through reduced sperm count, low motility, and morphological alterations. Dietary habits can be beneficial or detrimental depending on composition. Avoiding processed foods, fast food, and saturated fats reverses this situation.

Conclusion

A balanced diet and healthy lifestyle significantly improve seminal quality. The scientific community must develop research to generate evidence on specific diets or foods influencing male fertility an underexplored area.

Conflicts of Interest

The authors declare no conflicts of interest.

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