STM JOURNALS

Research & Reviews: A Journal of
Toxicology

https://journals.stmjournals.com/rrjot/

ISSN: 2231-3834 (Online)
ISSN: 2349-1264 (Print)
Volume 14, Issue 2, 2024
May—August
DOI (Journal): 10.37591/RRJoT

Research RRJoT

Oligomenorrhea: An Overview in Toxicology

Gyanendra Kumar Gupta[1,*], Gagan Devi[2]

Abstract

In the contemporary era, characterized by a rapid and competitive lifestyle, various gynecological problems are becoming more common due to sedentary behaviors, poor dietary habits, and other factors. The intersection of physical and mental health profoundly influences the regularity of women's menstrual cycles. Studies show that a substantial 80% of women experiencing irregular menstrual patterns are diagnosed with oligomenorrhea, constituting nearly one-fifth of this demographic. This highlights a troubling trend where lifestyle choices play a pivotal role in shaping gynecological health outcomes. Sedentary lifestyles, characterized by prolonged periods of sitting and physical inactivity, significantly contribute to hormonal imbalances that can disrupt the menstrual cycle. Similarly, poor dietary choices, such as diets high in processed foods, sugars, and fats, can exacerbate these issues by impacting hormone production and overall health. Stress, another prevalent aspect of modern life, also plays a crucial role, as it can disrupt hormonal regulation and contribute to menstrual irregularities. The impact of these factors is compounded by the interconnected nature of physical and mental well-being. Psychological stressors, such as work pressure or personal challenges, can trigger hormonal changes that affect the menstrual cycle. Conversely, irregular periods can lead to emotional distress, further exacerbating the cycle of hormonal imbalance. Addressing these issues requires a holistic approach that considers both physical and mental health factors. Encouraging regular physical activity, promoting balanced diets rich in nutrients, and implementing stress management techniques are essential steps. Moreover, increasing awareness about the link between lifestyle choices and gynecological health can empower women to make informed decisions about their well-being. In conclusion, while modern life offers numerous conveniences, it also presents challenges that impact women's health. By understanding and addressing the complex interplay between lifestyle choices, physical health, and mental well-being, we can strive to improve gynecological health outcomes in today's dynamic world.

Keywords: Gynecological issues, menstrual cycle, oligomenorrhea, sedentary lifestyle

INTRODUCTION

Women possess a unique gift bestowed by God, allowing them to give birth and thus earning them the status of visible creators. Nature has endowed women with specific anatomical and physiological characteristics collectively referred to as *Streeva*. One such characteristic is the menstrual cycle, which plays a crucial role in a woman's physical and emotional well-being [1]. This cycle involves monthly hormonal fluctuations that influence various aspects of a woman's life. The shedding of the endometrium, prepared in anticipation of nurturing a fertilized egg, marks the onset of menstruation when conception does not occur. Despite not all women becoming mothers, their inherent capacity for creation underscores their significance. Fertility, therefore, holds paramount importance for women, with any factors hindering it receiving special attention for treatment. Normal

***Author for Correspondence**
Gyanendra Kumar Gupta
E-mail: gyanender.gupta@gmail.com

[1]Professor and HOD, Department of Kriya Sharir, Shri Babu Singh Jay Singh PG Ayurvedic Medical College, Farrukhabad, Uttar Pradesh, India
[2]Associate Professor, Department of Rachna Sharir, Bharat Ayurvedic Medical College and Hospital, Muzaffarnagar, Uttar Pradesh, India

Received Date: March 26, 2024
Accepted Date: April 06, 2024
Published Date: April 26, 2024

Citation: Gyanendra Kumar Gupta, Gagan Devi. Oligomenorrhea: An Overview in Toxicology. Research & Reviews: A Journal of Toxicology. 2024; 14(2): 45–51p.

physiological processes occur cyclically in the body, and any disruptions can lead to pathological conditions. Among these processes, the menstrual cycle stands out as a beautifully orchestrated hormonal change that occurs monthly in women. Menstruation is a vital physiological function during a woman's reproductive years [2].

The female menstrual cycle, influenced by rhythmic phenomena, involves significant hormonal fluctuations affecting both physical and emotional states. Disorders such as secondary amenorrhea and oligomenorrhea often require counseling and appropriate treatment. The altered physiology in the hypothalamic–pituitary–ovarian–uterine (H-P-O-U) axis demands attention to address the pertinent questions it raises [3].

AIMS AND OBJECTIVE

This article aimed for a detailed study of oligomenorrhoea.

CONCEPTUAL STUDY

Oligomenorrhoea can be defined arbitrarily as one in which the cycle lasts longer than the 35 days with only 4 to 9 cycles in a year. Menstruation may be both infrequent and irregular or may be regularly infrequent. Infrequent menstruation and amenorrhea are essentially similar symptoms with identical cause the difference is only one of degree.

Etiology

During a regular menstrual cycle, hormonal changes prompt the uterine lining to thicken each month in preparation for a potential fertilized egg. Of course, an egg does not always find its way to the uterus [4]. When the lining is not needed, the tissue sloughs off, passes through the cervix and into the vagina, where it can then leave the body in the form of a period.

Oligomenorrhoea can be caused by hormonal imbalance. Menarche to menopause the length, regularity and menstrual flow is under the hormonal control of H-P-O-U axis. Adrenal gland also takes part in production of steroid hormones. Thus the causes and be divided into

- Physiological factors
- Pathological factors

Physiological Factors

It is quite common for women at the start and end of their reproductive years to experience missed or irregular menstrual cycles. It is normal and is usually the result of imperfect coordination between the hypothalamus–pituitary–ovarian axis [5].

- Pregnancy
- Lactation

Pathological Factors

Uterine Factor

- *Tubercular endometriosis:* There is destruction of the endometrium or inhibition of ovarian function by tubercular toxins.
- *Post radiation:* There will be destruction of endometrium.
- *Synechiae:* Inrtauterine adhesions–viscero cortical reflex leads to amenorrhoea.
- Surgical removal of endometrium, that is, ablation of endometrium by laser, resectoscope.
- Due to absence of follicle-stimulating hormone (FSH) receptors.

Ovarian Factors

Autoimmune Disease

Polycystic ovary disease (PCOD), tonically elevated luteinizing hormone (LH), increased androgen production from theca cell, and stroma of the ovaries decrease sex hormone binding globulin (SHBG)—

increased unbound estrogen and androgens pituitary sensitivity to gonadotropin-releasing hormone (GnRH) is increased preferential increased production of LH, decreased production of FSH due to inhibin. Disturbed adrenal function is also implicated in androgen excess.

Resistance ovarian syndrome (Savage syndrome) defect in FSH receptors, follicles are present but are resistant to gonadotropins [6].

Hypoestrogenic State

Radiotherapy: Makes the ovaries unresponsive to gonadotropins.

Surgical extirpation: Removal of site of production of estrogen.

Pituitary Factors

Tumors like prolactinoma, chromophobe adenoma, Cushing disease.

In all the above conditions, there is microadenoma associated with hyperprolactinemia. This inhibits steroidogenesis of ovary directly and inhibits pituitary release of LH and FSH.

- Simmond's disease [7]
- Sheehan's syndrome

In above two conditions there is partial or complete destruction of pituitary by ischemia caused by venous thrombosis. The principal hormones affected are growth hormone, LH, FSH, thyroid-stimulating hormone (TSH), adrenocorticotrophins, and prolactin.

- Hyperprolactinemia

Hypothalamus Causes

- GnRH deficiency
- Vigorous exercise
- Pseudocyesis
- Brain tumors
- Psychogenic shock stress
- Anorexia nervosa – release of GnRH is inhibited.

Low levels of estrogen and LH are observed, while FSH levels remain within the normal range. Hyperprolactinemia may occur due to changes in dopamine inhibition. Surgical removal is often necessary for tumors located in the hypothalamus and pituitary gland.

Adrenal Causes

- Cushing syndrome
- Suprarenal tumors of hyperplasia

The effect of estrogen on the endometrium is opposed by excess androgen.

Estrogen is a key hormone for regulating menstruation, is found in body fat. Having more body fat increases one's estrogen levels, which can impact the menstrual cycle.

Thyroid Factors

- Hypothyroidism
- Graves' disease
- Raised TSH and hyperprolactinemia by direct action of thyrotropin-releasing hormone (TRH) on galactophere cells in the pituitary gland.

Drugs

- *Contraceptive pills:* This leads to 'post pill syndrome' due to suppression of GnRH release.
- *Antidepressants, dopamine blockers:* These agents raise the prolactin levels.
- *Antihypertensives:* These are dopamine depleting agents and raise the prolactin levels.

Nutritional Factors

- Extreme obesity
- Excessive weight loss in the athletes and ballet dancer
- Severe anemia
- Malnutrition
- Chromosomal factors

An underlying sex chromosomal abnormalities such as an XXX arrangement.

Other Factors

- Diabetes
- Renal disease

Probably all these factors will be affecting the H-P-O-U axis.

Many women are obese, hirsute, with poorly developed secondary sexual characters, genital hypoplasia, and ovarian subfunction.

Approach Towards Oligomenorrhoea

There is altered coordinate function of H-P-O-U axis by some pathology.

Hence a thorough history taking has a prime importance and all clinical examination is mandatory.

Laboratory investigations are necessary either to diagnose or to validate the clinical diagnosis. Detail history taking also plays an important role which further helps to decide line of treatment [8].

This includes

1. Mode of onset of menses.
2. Sudden change in environment, emotional stress, or any mental upset.
3. Sudden change in weight may be loss or gain
4. Intake of psychotropic or antihypertensive drugs.
5. History of:
    - Radiotherapy or chemotherapy
    - Acne, hirsutism, change in voice.
    - Inappropriate galactorrhea.
    - Headache or visual disturbance.
    - Hot flushes and vaginal dryness.
    - Curettage leading to synechia, post-partum or post-abortion infection.
6. Labor and puerperal events—post-partum hemorrhage (PPH,) shock, lactation.
7. Medical history of tuberculosis, diabetes, chronic nephritis or overt hypothyroid state, duration of use of oral contraceptive pills (OCPs).
8. Family history if anything to be enquired.
9. General examination:
    - Nutritional status
    - Extreme emaciation or marked obesity.
    - Presence of acne or hirsutism
    - Breast discharges.

10. Pelvic examination:
    - Examination of external genitalia along with development of secondary sexual characters.
    - Enlargement of clitoris.
    - Adnexal mass suggestive of tubercular tubo-ovarian (T-O) mass.
    - Per-vaginal examination.

Special Investigations

Urine pregnancy test—To exclude pregnancy in women with active reproductive period.

Radiology: Radiology of pituitary gland. Computed tomography (CT) scan to detect pituitary adenomas. Ophthalmology: Examination of retina and visual field should be done if pituitary tumor is suspected.

Hormonal Assays

- FSH, LH, serum prolactin, testosterone levels
- TSH, T3, and T4 levels
- Increase in gonadotrophins indicates primary ovarian failure.
- Decrease in gonadotrophins indicates hypothalamus pituitary defect.

Ultrasound to document status of uterus, ovaries.

- Thickness of endometrium
- Endometrial thickness <4 mm indicate anorexia nervosa.

Chromosomal studies for excluding

- Turner's syndrome (XO)
- Super female (Trisomy X or XXX)

Surgery

Laparoscopy – a minimally invasive procedure: This surgery only requires a few tiny incisions in belly to allow the surgeon to use a camera and some tools to explore abdominal and pelvic cavity. The procedure usually has a shorter recovery time than other types of surgery and can be very useful in diagnosing conditions that do not show up on a blood test or ultrasound, such as endometriosis [9].

Laparotomy: This procedure necessitates larger or additional incisions and entails a longer recovery period. It is possible that if it is scheduled to have a laparoscopy, but may end up needing a laparotomy to deal with what the surgeon finds.

Treatment

Reassurance plays a major role.

If oligomenorrhea is related to something in lifestyle, such as weight, exercise routine, or stress levels, then changes need to be made.

Therapeutic Tests

When investigations leave doubt as to with link of H-P-O-U axis is primarily at fault, therapeutic test is of great value.

The first of these is to assess uterine sensitivity to ovarian hormones.

After excluding pregnancy, hyperprolactinemia, and hypothyroidism, a progesterone challenge test is administered.

If the patient has withdrawal bleeding, it indicates the presence of a functional outflow tract and also presence of sufficient circulating endogenous estrogens which has primed the endometrium and the diagnosis is anmulation.

If on the other hand, the patient does not have withdrawal bleeding in response to the progesterone challenge, a combination of both estrogen and progesterone is given.

If negative response indicates a defect in the outflow tract, that is, uterine amenorrhea.

If bleeding does occur, it points to a defect in production of both estrogen and progesterone.

Serum FSH and LH levels are measured. If these are raised, the cause is ovarian failure where as if they are low or normal, the cause is hypothalamic.

GnRH dynamic test–If with GnRH administration, there is rise of pituitary gonadotropins, it is probably a cause of hypothalamic dysfunction.

Laparoscopy

This is done to exclude the presence of streak gonads and small ovarian tumors.

To recognize PCOD in which ovarian drilling can be done.

Abnormal gonads may be removed at the same sitting.

Treating underlying health conditions [10].

DISCUSSION

These menstrual disorders pose a significant challenge for women in contemporary times. During the reproductive years, significant physiological changes take place as part of the natural progression from puberty. However, these physiological processes can be influenced and altered by the lifestyle changes experienced by women, including heightened levels of physical and emotional stress which disrupts the H-P-O-U axis, leading to many gynecological problems. Menstrual irregularity is one among them.

Scanty and infrequent menstrual periods often induce anxiety about potential fertility issues and may lead to feelings of guilt, questioning a woman's ability to conceive and her feminine identity. These concerns can significantly disrupt both physical and emotional well-being, impacting various aspects of family and social life. While numerous treatment options exist for addressing these menstrual irregularities, there remains a need for a more effective and promising therapy. Therefore, the current study was conducted to explore new avenues in addressing these challenges.

CONCLUSION

It can be inferred that there is a disruption in the physiological functioning of the H-P-O-U axis, resulting in symptoms such as irregular menstrual cycles and scanty menstrual flow. The assurance and hormonal therapy are recognized as the standard course of treatment for addressing these symptoms. The observed irregularities in menstruation and menstrual flow suggest an underlying disturbance in the intricate hormonal regulation governed by the H-P-O-U axis. This axis is crucial in regulating the menstrual cycle, with the hypothalamus, pituitary gland, ovaries, and uterus intricately involved in managing hormonal signals and responses. Disruptions to this delicate balance result in menstrual irregularities. characterized by infrequent cycles and reduced menstrual flow.

The accepted approach to managing such manifestations involves a dual strategy of assurance and hormonal therapy. Assurance entails providing patients with reassurance and support, helping alleviate

anxiety and concerns related to their menstrual irregularities. Simultaneously, hormonal therapy aims to restore hormonal balance and regulate menstrual cycles.

This might include using hormone medications like oral contraceptives or hormone replacement therapy to regulate the menstrual cycle and alleviate related symptoms. essence, addressing irregular menstruation and scanty menstrual flow necessitates a comprehensive approach that acknowledges the underlying hormonal imbalances within the H-P-O-U axis. By combining assurance with targeted hormonal therapy, healthcare providers can effectively manage these symptoms, thereby improving the overall well-being and quality of life for affected individuals

REFERENCES

1. Dutta DC. Textbook of Gynecology. 2nd edition. Central Publication; 1994.
2. Salhan S. Textbook of Gynecology. New Delhi, India: JP Brothers Medical Publishers; 2011.
3. Zutshi V, Rathore AM, Sharma K. Hormones in obstetrics and Gynecology. New Delhi, India: JayPee Publication; 2000.
4. Bhattacharya S. Infertility. In: Edmonds DK, editor. Dewhurst's Textbook of Obstetrics & Gynaecology. 7th edition. Malden, MA, USA: Blackwell; 2007. pp. 440–460.
5. Fritz MA, Speroff L. Clinical Gynecologic Endocrinology and Infertility (Parts I and II). 7th edition. Philadelphia, PA, USA: Lippincott Williams & Wilkins; 2005.
6. Cooper TG, Noonan E, von Eckardstein S, Auger J, Baker HW, Behre HM, Haugen TB, Kruger T, Wang C, Mbizvo MT, Vogelsong KM. World Health Organization reference values for human semen characteristics. Human Reprod Update. 2010; 16 (3): 231–245.
7. Goyal RK, Hirano I. The enteric nervous system. N Engl J Med. 1996; 334 (17): 1106–1115.
8. Padubidri VG, Daftary SN, editors. Shaw's Textbook of Gynaecology. 14th edition. Amsterdam, Netherlands: Elsevier; 2008.
9. Rao KA, editor. The Infertility Manual. 2nd edition. New Delhi, India: Jaypee Brothers; 2004.
10. Kumar P, Malhotra N. Jeffocoate's Principles of Gynaecology. 7th international edition. New Delhi, India: Jaypee Brothers; 2000.

