

Women With Fibromyalgia- An Approach

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Abstract

Weight gain is the most common issue or challenge seen in adults of all age groups. This weight change (gain/loss) has commonly been observed in women with a fertile window and moving towards menopause. The most contributing factors leading to this weight gain are either PCOS/OCP'S/HRT or increased stress levels affecting the normal estrogen release. Various factors that contribute to weight gain may involve, including endocrine or metabolic factors or lifestyle changes contributing to the aforementioned factors. To suggest any weight management techniques which may include physical activities including various forms of exercise dietary regimes, or any other form of alternative medicines, we need to work upon the hormonal studies of the individual to find out the root cause of the problem. Many studies have revealed that poor lifestyle, stress and peer pressure, and social and environmental factors are the most common leading factors for hormonal disturbances and weight gain.

Keywords: Hormonal Changes, Weight Gain, estrogen levels, Physical activity, stress, menopause.

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I. Introduction

Hormones are the chemical messengers of our human body and are synthesized in the endocrine glands, hormones travel around the bloodstream and give signals to our tissues and organs to perform their actions. These hormones play a very important role in controlling major functions of the human body mainly the reproductive and metabolic functions.[1]

When anyone complains of hormonal imbalance, the variation can be too little or high. Hormones are like topping on the ice cream, a slightly high or low values affect your presentation.

While hormones keep on fluctuating starting from puberty to natural aging. It has been seen as more noticeable in females than males of the same age group.

II. Pathophysiological relationship between Hormones and weight gain

Estrogen is a sex hormone that is the mainstay for the development of the female reproductive system and regulation. There are three main endogenous estrogens namely – estrone, estradiol, and estriol.[2] During menopause, estrone levels are very high while during pregnancy, there are predominant serum values of estriol, and in postmenopausal women again the estrone levels are very high and contribute to the main form of estrogen.[3] The anabolic functions of estrogen are to increase the body's muscle mass as well as strength and improve the property of muscle regeneration and bone health. It also increases the sensitivity toward exercise, protects against muscle damage, provides collagen synthesis, improves cartilaginous strength, and reduces the stiffness of soft tissues mainly during menstruation.[4] The predisposition of soft ligaments towards injury generally increases during this phase. To understand your health symptoms, always recommendable to consult with a specialist.

The one main reason for a decrease in Estrogen level is menopause. It is a mid-life crisis that every woman faces in her life. Many women observe weight gain during this phase.

One reason why women often gain weight during menopause is changing hormone levels. Estradiol type of Estrogen becomes low at menopause. This hormone helps to regulate body metabolism and maintain body weight. A decrease in the level of Estradiol may lead to weight gain.[5]

During their lifetime, a woman may experience weight gain around their hips and thighs with a pear-shaped body type. Despite that, after menopause, the weight put around their midsection and abdomen led to an apple-shaped appearance. It is generally known as visceral fat.[6]

Visceral fat can be very life-threatening and considered a risk factor for various other medical problems that may include:

- Insulin resistance diabetes
- brain attack
- myocardial infarction
- some tumors

The change in Estrogen levels decreases muscle mass. Women complain of myalgia, muscle weakness, and generalized body pains. These factors play a more significant role in a weight increase that changes the Estrogen values.[7]

III. Signs or symptoms of a Hormonal Imbalance

Hormones play a vital role in your life. A slight change in their values can develop various alarming signs and symptoms.[8][9][10][12] The most common hormonal problems affecting both women and men may be the cause of the following clinical manifestations:

- Weight gain or loss
- Weight around the upper back sometimes called a hump
- Intermittent weight gain/weight loss
- Early fatigue
- Weakness in muscles leading to muscle aches or body aches
- Tiredness and body stiffness
- pain around the joints
- Generalized body pains
- Early Morning Stiffness
- Pounding heart rate
- Increased sweating
- Increased sensitivity at extremes of temperatures
- Diarrhea/ Dehydration
- Constipation/Irritable bowel syndrome
- Fibromyalgia
- Restless Leg Syndrome
- Swelling in both the legs
- Ankle edema
- Stress incontinence
- Urine incontinence
- Dryness of mouth
- Anorexia nervosa/ Anorexia bulimia
- Loss of libido
- Depressive thoughts
- Loneliness
- Anxiety and Fear
- Attention deficits
- Foggy brain
- Mood swings
- Vision changes
- Skin lesions
- Mole
- Infertility
- Excessive hair growth in females
- Dry and itchy skin

- Stretch mark

IV. There are the following conditions that lead to hormonal weight gain in women:

Endometriosis is a condition that leads to the thickening of the outer lining of the uterus. This endometrial tissue can propagate to the surrounding areas like fallopian tubes, and ovaries. The formation of this tissue causes intense pain during the onset of menstruation. While the most common symptoms people with endometriosis report is a pain in their pelvis, abdominal bloating, and weight gain. It has been investigated and proved that Estrogen levels are high in the women who complain of this pain.[11]

PCOS, Polycystic Ovary Syndrome is referred to as endometriosis due to similar symptoms of pain, weight gain, and abdominal bloating during menstruation.[12] In PCOS, insulin resistance levels are very high that increasing the chances to develop type-II diabetes mellitus in this population. In this case, people with PCOS have hormonal imbalances such as insulin resistance (which causes an increase in risk for type II diabetes) and excessive androgen levels.

Menopause led to sleep disturbances, emotional turbulence, mood swings, brittle nails, thinning hairs, hot flashes, migraine type of headaches, and sudden weight gain.[13] During this age, women are more prone to develop heart disease. There is sudden depletion of calcium and vitamin D levels in the blood. The woman complains of more joint pains with a decrease in muscle mass.

Cortisol is a hormone that causes weight gain in both men and women. Cortisol controls the fight and flight response and shoots in a state of stress or anxiety. When its level increases, the blood sugar levels become high and glucose level drops resulting in fatigue, giddiness, and cravings for sweets.[14] People generally prefer to take sweets, chocolates, and ice cream to handle this situation. During this phase, high recommendations have been given for green vegetables, apples, legumes, sprouts, quinoa, and oatmeal products that cause smaller spikes in glucose levels. People with a marked increase in cortisol levels complain of weight gain in the chest, stomach, and face.

Thyroid Disorders

The thyroid gland releases T3 and T4 hormones. Decreased count of these hormones causes hypothyroidism. Hypothyroidism causes decrease in the basal metabolic rate and leads to accumulation of hyaluronic acid, decreases renal flow and results into water retention. [41] The clinical features of hypothyroidism consist of fatigue, gain in weight, digestion problems, generalized body pains, stiffness in joints, thinning hair, mood swings, lack of concentration, and goitre.[15] It has also been reported that hypothyroidism also slow down the peristaltic movements leading to constipation, which further may cause weight gain.[41]

Miscellaneous Factors

As discussed above, the various associated risk factors related to hormonal weight gain are:

1. Type-II Diabetes mellitus
2. Hypertension
3. Hyperlipidemia
4. Cardiovascular diseases
5. Insulin Resistance
6. Stroke
7. Thyroid disorders
8. Insomnia
9. Anxiety
10. Mood disturbances
11. Dysmenorrhea
12. Bronchial Asthma
13. Cognitive impairments
14. Tumors
15. Shortened Lifespan

These risk factors are fatal, the presence of any three to four risk factors needs immediate medical supervision.

V. When do you need an Endocrinologist as a specialist for Weight Gain?

Various factors contribute to sudden unexplained weight changes. Hormonal imbalance is one main reason for this unexplained weight shift. These include thyroid dysfunction, declining estrogen (often due to menopause), decreased value of necessary vitamins, and polycystic ovary disorder (PCOD). Weight gain may also be concurred by other signs and symptoms predominantly like mood swings, hot flushes, sleep disturbances, irritability, body aches, painful periods, headaches, and anxiety. If you find extra pounds of weight gain with no evident reasons or changes in diet or physical activity, you should discuss or consult your doctor. An endocrinologist can be your specialist to help identify hormonal imbalances by monitoring your symptoms and conducting laboratory tests when required.

VI. Investigations

Your physician may recommend some blood tests and other health examinations as per the need to find out the root cause of your prevailing symptoms. Tests including Estrogen levels, adrenal disorders, hormonal resistance, thyroid imbalance, insulin resistance, and many other hormonal imbalances can lead to weight gain. Laboratory tests give endocrinologists insight into hormonal imbalances when combined with your signs and clinical presentation. Investigations include MRI scans to rule out pheochromocytoma, Adrenal gland functions, and vitamins can be other investigations. For this purpose, we suggest more evaluations to see how metabolic information relates to this condition. Estrogen levels can be low in women for many reasons.[16]

VII. Treatment

Physical Activity in Hormonal Weight Gain

Physical inactivity is the most commonly discussed topic of this generation. Various evidence-based practices guide many ways of handling physical activity regimes for various age groups keeping the other factors under monitoring. There are various studies suggestive of doing regular physical activities throughout the life for a healthy you. This helps the individuals not only to maintain a healthy weight but it helps to prevent the development of various life-threatening conditions like myocardial infarction, stroke, diabetes, hypertension, and various cognitive impairments [17]. There is much evidence stating that Indian females play the role of caregivers more than the Indian males, the former being more physically active as compared to the latter.[18] The American College of Sports Medicine (ACSM) and The Center for Disease Control and Prevention (CDC) both have given a strong recommendation for physical activity for healthy adults. According to ACSM and CDC a regular and moderate aerobic activity of 150 minutes per week, even starting up with 5 minutes initially and muscle strengthening exercises 2 times a week will help your muscles to work harder than usual.[19]. Studies have shown that fewer than 40% of women engage themselves in moderate-intensity physical activity comprised of 30 minutes or more per day.[21]. It has been reported that there is a negative graph representing the decline in physical activity status of women as comparing a well-maintained graph of men population of the same age group.[19]. This altered statistical analysis signifies the development of various physical activity programs for improving the health status of adults [20]. Various studies conducted on healthy female demonstrates that there is a decline in the estradiol values with regular physical activity.[26]. A study has been conducted on postmenopausal osteoporotic women to find out the more effective exercises to improve the Estradiol levels and lean mass. It was concluded from the studies that anaerobic exercises are more effective as compared to aerobic resistance training.[29]

Gender differences in the physiological response to physical activity and exercise

A female body built carries a higher proportion of fat and less muscle mass as compared to the high muscle mass in their male counterparts. They have a high tendency to develop health complications like generalized body aches, decreased endurance, strength, and low stamina.[22]. A study has shown that the metabolic rate of males is highly different from that of females as the hormonal contribution is more in the females and need more energy from carbohydrates and fats than protein intake.[23]. Low resistance exercises would be a better option for the females than to go for high-intensity resistance exercises that better suit the male population. Endurance training can be the other choice for women of menopausal age.

Effect of Physical activity on sexual functions and quality of life

The menopausal age, affects the sexual life of the women and affects the quality of life, leads to poor women's health, and increases psychological concerns.[24]. It has been found that there is strong evidence of performing exercises to improve the quality of life in menopausal women. The exercises including yoga, meditation, and pelvic floor muscle training improve the physical quality of life.[25]. Yoga helps in the reduction of other menopausal symptoms related to the psychological well-being of women.[26]

Effect of physical activity on stress

Stress is defined as any situation that may arise due to any physiological, emotional, and environmental factor and disturbs the whole equilibrium and may impact the change in levels of hormones like cortisol, vasopressin, prolactin, catecholamines, growth hormones, and thyroid hormones.[27]. As mentioned, cortisol a hormone plays an important role in dealing with stressful situations at the time of fight and flight response. The study has revealed that glucocorticoids play an important role in dealing with a variety of stress levels and help the body to adapt to various exercise regimens. [27].

Alternative Treatment for controlling weight gain

- Dietary and lifestyle corrections for prevention of developing risk factors leading to serious health problems like hypertension, diabetes, thyroid, stroke, and not limited to physical activity and stress reduction.[36][37]
- Hormonal replacement therapy
- Cryotherapy and Cold compression units
- Oral contraceptive pills
- Aerobic exercises
- Testosterone replacement
- OCPs
- Symptomatic treatment
- Yoga and meditation for stress management
- Nutritional Counselling
- Food supplementation
- Biological clock monitoring
- Other medical therapies like panchakarma and Siddha therapies

VIII. Preventive care for weight gain

To seek early consultation with the doctor so that the appropriate intervention can help with minimizing and possibly reversing hormonal weight gain. In addition, improving dietary intake, planning physical activity, improving sleep patterns, managing stress effectively, quitting habits like smoking, drinking alcohol, tobacco chewing, and limiting a sedentary lifestyle are other ways to prevent hormonal weight gain.[37]

Prevention of weight gain in a post-menopausal woman

Women of post-menopausal age generally complain of abdominal bloating, fatigue, joint pains, and generalized body aches. Hormonal imbalance and changes in Estrogen levels generally affect this age group. There is so specific protocol that can be advisable for women belonging to this age group. An individualized goal plan depending on the symptom checker can be designed to successfully achieve the results. Physical activity includes various forms of exercises most likely strengthening exercises, low resistance exercises like Tai-chi can help to reduce weight gain during this age. To maintain this extra shed off, it is highly recommended to keep in activity so that hormonal imbalance can be controlled by maintaining the other contributing factors that may interfere with hormonal changes.[38][39]

Muscle-building activities help to burn up more calories thus decreasing the fat composition.

As the experts recommend moderate aerobic activity most likely brisk walks, treadmill walks or cycling for 150 minutes a week, or vigorous activities like jogging or running for 75 minutes a week helps to maintain a healthy body type.[40]

In case you have any other health and fitness goals, adding up with muscle strengthening and muscle toning can further be a topping on the ice cream.

According to the nutrition counselors, a decrease in your calories of 200-300 fewer calories than what you had in your initial 40s can help to lose extra pounds and help in maintaining your healthy digestion

To decrease your calories does not mean you can eat or drink anything, but you need to pay extra attention to what you eat or drink and at what time of the day it has been consumed based on your metabolic demands helps in maintaining a healthy well-being. Restrict yourself to a diet with more vegetables, fruits, whole grains, and less processed food, and adding more fibers would generally be a better option. But this idea of nutrition should be taken under proper consultation, as it requires self-monitoring that how your body responds to these eating patterns. Many of the people following these regimes complain of constipation, abdominal bloating, uneasiness, and Diarrhea. If any of these symptoms prevail for more than three days, (as it's the time your body takes to adapt to the changes) immediately seek consultation with the nutritionist. Many of the time, we stop this dietary advice because of the appearance of these temporary symptoms without looking for better solutions. Trending vegan diet, plant-based diet, keto diet, and low-fat diet is in heavy demand. But this is not choice-based, it should be taken up

as per the bodily demands to meet up your goals for weight loss but to maintain your health for many more years as your body is subject to change due to aging factors. To keep the visceral fat into proportion by cutting off from the sugary food products can also contribute towards maintaining insulin sensitivity and decrease the risk of development of metabolic syndromes like diabetes mellitus-II.[42]

Other components like alcohol intake, smoking, and caffeine intake along with the medications that you take generally for other medical reasons can also affect your weight management goals.

Lifestyle changes including, physical activity, nutrition, stress management, obesity management, peer meetings, societal activities, environmental factors, and your psychological well-being are the various other factors that contribute to helping you in a weight loss program followed by hormonal changes.

Acronyms and Abbreviations

PCOS- Poly- Cystic Ovarian Syndrome

OCP- Oral Contraceptive Pills

HRT-Hormonal Replacement Therapy

MRI-Magnetic Resonance Imaging

ACSM- American College of Sports Medicine

CDC- Center for Disease Control and Prevention

IX. Conclusion

The content mentioned in this book chapter will help the readers to understand the influence of hormonal play on weight gain in women of premenopausal, menopausal, and postmenopausal age groups. It will help society to manage various factors, especially physical activity and other lifestyle changes like diet yoga, and other treatment approaches to prevent many of the life-threatening diseases that increase in women at the menopausal age. It will help the women's society to live a happier, pain-free, and healthy life.

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Conflict of Interest

The author declares no conflict of interest.

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