

A NARRATIVE REVIEW ON DISEASES TRIGGERED BY MENOPAUSE

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Abstract:

Menopause is an inherent physiological occurrence encountered by females during the midlife stage. In order to facilitate the effective management of this event among women, it is imperative to ascertain their healthcare information requirements. It is commonly linked with the medical conditions of osteoporosis, osteoarthritis, and sarcopenia. Sarcopenia encompasses the degenerative process of age-related muscle atrophy, accompanied by the decline in muscular performance. This condition has recently gained recognition within the medical community and is understood to be exacerbated by a deficiency in oestrogen. Osteoarthritis has been found to exhibit a correlation with oestrogen deficiency in recent medical research. A locomotor disability results in a diminished quality of life. Deterioration in musculoskeletal well-being has the potential to advance to a state of frailty, leading to an elevated occurrence of falls and fractures. These subsequent events contribute to an augmented burden of illness and mortality. Healthcare providers and policy makers must prioritise their attention towards this specific cluster of disorders and incorporate preventive measures into national programmes aimed at mitigating the utilisation of health resources.

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1. Introduction:

Menopause is a physiological condition that arises due to the cessation of ovarian follicular activity, leading to the termination of the menstrual cycle. In a clinical context, the diagnosis of menopause is established when an individual has experienced a cessation of menstruation for a consecutive duration of 12 months [1]. Menopause can manifest through either natural physiological processes or as a result of surgical or medical interventions. The prevalence of middle-aged women is experiencing a significant upward trend. In the year 1990, the global estimation for the population of women aged 50 years and above was recorded at 467 million. It is projected that

this figure will witness a substantial rise, reaching approximately 1200 million by the year 2030 [2]. The majority of women undergo the physiological process of menopause typically occurring within the age range of 40 to 58 years [3]. With the progressive rise in life expectancy, it has been observed that women are presently experiencing a significant portion of their lifespan in the postmenopausal phase. This prolonged duration of postmenopause has the potential to exert an influence on their overall health and well-being [4, 5].

The incidence of non-communicable diseases, including cardiovascular disease, diabetes, chronic respiratory disease, and cancer, exhibits an upward trend subsequent to the onset of menopause [6]. Research findings indicate that non-communicable diseases exhibit a higher prevalence among the female population compared to males [7]. Moreover, these diseases have

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been identified as the primary contributor to mortality rates among women on a global scale [8]. Enhancing women's cognitive aptitude through the provision of equitable and accessible access to dependable information has the potential to mitigate the prevalence of non-communicable diseases and enhance their overall well-being [9].

The musculoskeletal well-being of females is progressively emerging as a significant health concern during the middle-aged and older stages of life. The presence of locomotor disability and frailty in postmenopausal women has been found to have a significant impact on both their quality of life and mortality rates. Specifically, the occurrence of falls and subsequent fractures further exacerbate these negative outcomes [10]. Osteoporosis is a widely acknowledged and highly prevalent skeletal condition observed primarily in postmenopausal women. It is characterised by diminished bone mineral density and the progressive deterioration of bone microarchitecture. This risk is further exacerbated by muscular weakness, joint weakness, and frailty, collectively augmenting the susceptibility to falls. Osteoarthritis is a widely recognised and readily diagnosable medical condition characterised by the degeneration of cartilage [11]. Sarcopenia, a recently acknowledged medical condition, refers to the age-related decline in both skeletal muscle mass and function [12]. Sarcopenia has the potential to advance to frailty and sarcopenic obesity, thereby placing these women at risk of compromised quality of life and heightened mortality rates [13]. This review aims to examine the diverse musculoskeletal disorders in women that are precipitated by the physiological transition of menopause.

1.1. Arthralgia:

Arthralgia, a condition characterised by musculoskeletal pain, is observed as a prevalent symptom among menopausal women, affecting a minimum of 50% of individuals. This manifestation of pain in the joints is widely reported across various international populations, as documented in studies [10–13]. In this particular scenario, it is imperative to note that no secondary aetiology has been identified based on the established cri-

teria. Typically, pain does not manifest as the primary symptom during menopause, but rather as a component of a broader syndrome. However, it is the prevailing symptom in 21% of female individuals [5]. Arthralgia and myalgia of any aetiology are frequently correlated with symptoms such as fatigue, affective alterations, sleep disruption, elevated body mass index (BMI), anxiety, or stress [14]. Considering that these characteristics are commonly linked to menopause, they can potentially enhance the occurrence of arthralgia and be exacerbated by its presence. Menopause-related arthralgia is commonly of a temporary nature and tends to resolve on its own. While some women may not seek medical attention for this condition, it can cause ongoing discomfort for a small portion of individuals or progress into arthritis or chronic widespread pain in susceptible populations. Therefore, it is imperative to periodically reassess persistent arthralgia to ascertain the absence of any alterations in the diagnosis.

Insufficient empirical data exists regarding the most effective approach to managing arthralgia associated with menopause. In the realm of musculoskeletal pain management, it is generally recommended to diligently manage body weight, particularly in cases where the body mass index (BMI) is elevated. Additionally, incorporating a consistent regimen of physical activity is advised. This activity can encompass both aerobic and joint-specific components. There exists a body of evidence suggesting that engaging in moderate levels of physical activity may have a positive impact on peri-menopausal arthralgia and other symptoms associated with menopause [15]. If there is evidence of deconditioning, it is recommended to implement a structured and progressive exercise regimen, while being cautious to avoid abrupt overexertion of painful joints. Such overexertion may worsen pain symptoms and lead to decreased confidence and adherence to the exercise programme.

1.2. Osteoarthritis:

Osteoarthritis, also known as degenerative joint disease, is a chronic inflammatory condition characterised by the gradual deterioration of carti-

lage within the joints. It is currently acknowledged that cartilage degeneration may transpire as a consequence of oestrogen insufficiency during the perimenopausal period. Advanced age, obesity, suboptimal joint alignment, traumatic incidents, and familial predisposition are among several identified risk factors [16]. The condition may persist in a latent state for an extended duration, prior to manifesting noticeable symptoms. Pain, swelling, crepitus, and stiffness of joints are frequently observed clinical manifestations. The diagnostic approach typically involves a combination of clinical and radiological assessments. The utilisation of radiography, specifically plain radiographs, proves to be valuable in the process of establishing a medical diagnosis. The process of degeneration, along with the existence of osteophytes, contributes to the diagnostic evaluation [17].

Lifestyle modifications, such as adopting healthier habits, implementing weight reduction strategies, making dietary adjustments, engaging in physical exercises, and utilising supportive devices, are fundamental approaches to mitigate the continued advancement of the ailment. Nonsteroidal anti-inflammatory drugs (NSAIDs) serve as the cornerstone for symptomatic management, aiming to alleviate inflammation and alleviate pain [18]. There exists a substantial body of evidence substantiating the advantageous effects of hormone therapy on the progression of osteoarthritis [19]. Nevertheless, several reports also indicate that hormone replacement therapy (MHT) may indeed induce degenerative alterations in cartilage [20]. Therefore, based on the contradictory findings, it is not recommended to consider MHT as an initial therapeutic approach for managing the advancement of osteoarthritis. Nevertheless, hormone therapy prescribed for alternative manifestations of menopause may potentially provide advantages to women experiencing osteoarthritis.

1.3. Fibromyalgia:

Fibromyalgia (formerly referred to as myofascial pain syndrome) is recognised as one of the prevailing causes of chronic arthralgia and myal-

gia in adult females. The aetiology of this condition remains incompletely elucidated; however, it is plausible that genetic and hormonal factors play a pivotal role in the manifestation of heightened pain sensitivity and predisposition to other chronic pain syndromes. Pain is commonly observed in all four quadrants, predominantly axial, accompanied by widespread discomfort in the cervical, scapular, thoracic, and pelvic regions [21]. A documented record of suboptimal sleep patterns and chronic unexplained fatigue are commonly observed. Arthralgia and myalgia are commonly accompanied by a constellation of additional symptoms, such as paresthesia, erythema, or edoema of the extremities. The presence of the female gender, a tendency towards catastrophizing personality traits, and elevated scores on depression or anxiety assessments have all been identified as risk factors [22]. There is an absence of observable joint edoema or inflammation, and muscular strength appears to be within normal parameters. Characteristic tender 'trigger points' may be observed, although the presence of these is not essential for the diagnosis of Chronic Widespread Pain. Individuals diagnosed with fibromyalgia commonly exhibit increased pain sensitivity in areas beyond the joints and spine, or experience pain that impacts other bodily systems [23]. There exists a plausible hypothesis suggesting the presence of a shared pathogenesis underlying various presentations of chronic pain. Several of these medical conditions, such as migraine, exhibit a higher prevalence during the period of menopause. It is imperative to acknowledge the correlation between fibromyalgic symptoms and menopausal symptoms.

1.4. Sarcopenia:

Sarcopenia is a recently coined term derived from the Greek words "sarko," referring to skeletal muscle, and "penia," indicating a deficiency [9, 10]. Sarcopenia refers to the degenerative decline in skeletal muscle mass and functionality that commonly occurs with advancing age. Conversely, cachexia denotes the condition characterised by involuntary weight loss primarily attributed to an underlying pathological condition.

Both conditions should be clearly distinguished as they both pertain to muscle atrophy disorders prevalent in the geriatric population, yet they often remain underdiagnosed. The term "dynapenia" is employed to describe the phenomenon of muscle strength decline [24].

According to scientific literature, individuals over the age of 50 may experience an estimated annual decline in muscle mass of approximately 1-2% [11]. The incidence of sarcopenia in females exhibits an upward trend approximately at the age of 50, while in males, the prevalence experiences an escalation during the sixth decade of life. A cross-sectional study has documented a reduction in skeletal muscle mass at a rate of 0.6% per annum subsequent to the onset of menopause. Postmenopausal women exhibit a higher quantity of non-contractile muscle tissue, specifically intramuscular fat, in comparison to their younger counterparts [12–14].

Typically, patients present with complaints of impaired mobility, including challenges with chair transfers, stair negotiation, and balance restoration. Patients experience challenges ambulating on irregular terrains. Screening is strongly advised in individuals exhibiting prolonged periods of physical inactivity, unexplained weight loss, recurrent instances of falling, presence of concurrent medical conditions, particularly diabetes mellitus, slow gait speed of less than 8 metres per second over a duration of 4 minutes, or the manifestation of any specific symptom indicative of sarcopenia.

1.5. Osteoporosis:

Osteoporosis exhibits a significant prevalence within the population of India. In the year 2013, a total of fifty million cases of osteoporosis were documented. The incidence of vertebral fractures and hip fractures exhibits a significant increase in females as they advance in age [2]. Osteoporosis continues to be frequently overlooked in terms of diagnosis and treatment, despite the existence of a wide range of screening tests.

Dual energy X-ray absorptiometry (DEXA) is widely recognised as the definitive method for evaluating bone mineral density (BMD) and establishing a diagnosis of osteoporosis. Dual-

energy X-ray absorptiometry (DEXA) is a diagnostic imaging technique that is highly recommended for the evaluation of bone mineral density in postmenopausal women aged 65 and older, as well as in men above the age of 70. Additionally, DEXA is also recommended for both women and men over the age of 50 who possess certain risk factors or have experienced a fracture. This recommendation is supported by scientific literature [4]. The Frax score, also known as the Fracture Risk Assessment Tool, is a valuable instrument utilised in the medical field to determine the likelihood of a patient experiencing a fracture within a 10-year timeframe. The essential information needed includes the country of origin, body mass index (BMI), age, gender, and the aforementioned clinical risk factors. When a risk score of $\geq 3\%$ for hip fracture or a score $\geq 20\%$ for major osteoporotic fracture is detected, it is recommended that healthcare providers take appropriate action [14].

Osteoporosis is a predominantly preventable and manageable medical condition, and the occurrence of postmenopausal osteoporosis can be averted and addressed through the utilisation of menopausal hormone therapy (MHT). However, following the findings of the Women's Health Initiative (WHI) reports [15], the use of universal menopausal hormone therapy (MHT) is no longer recommended. Only women who exhibit symptoms and are at a high risk for osteoporosis should consider undergoing hormone therapy, as it has been shown to provide benefits for the management of osteoporosis [6, 7]. Postmenopausal women of advanced age may have alternative therapeutic interventions available to them, such as the administration of raloxifene and bisphosphonates. Newer compounds, such as tissue selective oestrogen complex, may also serve as a viable alternative in medical practise.

1.6. Rheumatoid arthritis:

Rheumatoid arthritis (RA) is a well-established type of inflammatory arthritis. The prevalence of this condition is threefold higher in the female population compared to males. The age range at which it typically manifests is between 35 and 55

years, with a notable association with women in the peri-menopausal and post-menopausal stages. Various genetic factors, including the presence of the HLA DR 'shared epitope', the presence of cyclic citrullinated peptide (CCP) antibodies (which may precede the onset of the disease by a significant number of years), and the habit of cigarette smoking, all contribute to an increased susceptibility to the disease. Rheumatoid arthritis (RA) frequently enters a state of remission during pregnancy; however, it is important to note that the exact causal relationship between hormones and this phenomenon has yet to be clearly established [25].

Rheumatoid arthritis (RA) commonly manifests as a polyarticular condition, impacting numerous peripheral joints in a symmetrical and progressive fashion. This is accompanied by observable indications of inflammation, including pain, swelling, increased temperature, diminished functionality, and occasionally erythema. Prolonged matutinal rigidity is commonly observed in a state of heightened disease activity, concomitant with certain systemic manifestations [14]. This systemic pathology has the potential to affect various other organ systems. Laboratory investigations typically demonstrate increased levels of acute-phase proteins such as erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP). Rheumatoid factor is frequently detected in individuals diagnosed with rheumatoid arthritis (RA) [9]. The presence of rheumatoid factor, or the more precise anti-cyclic citrullinated peptide (anti-CCP), is correlated with an elevated susceptibility to erosion and joint damage, particularly in individuals who smoke and those who possess the shared epitope. Ultrasound and various imaging modalities are employed in the evaluation and surveillance of rheumatoid arthritis (RA) [11].

The management of rheumatoid arthritis (RA) has undergone significant advancements over the past two decades due to the advent of novel biologic therapies. Timely identification (prior to harm) is crucial, and expeditious, early disease alteration, primarily employing disease-modifying anti-rheumatic drugs (DMARDs). The therapeutic

approach is intensified until the attainment of disease remission, employing biologic interventions such as anti-tumor necrosis factor (anti-TNF) agents when deemed necessary. An exhaustive examination of therapeutic interventions in this particular field is beyond the purview of this study [2].

1.7. Sarcobesity:

The condition characterised by a reduction in skeletal muscle mass coupled with an elevation in adipose tissue mass is referred to as "sarcobesity." The coexistence of sarcobesity and dynapenia is characterised by compromised physical mobility, the onset of diseases associated with one's lifestyle, such as type 2 diabetes, cardiovascular disease, and metabolic syndrome [22, 23]. Improper nutritional guidance for individuals with obesity can result in the degradation of skeletal muscle mass and a corresponding rise in adipose tissue. Sarcopenia is frequently exacerbated in individuals who are overweight or obese. Diets characterised by energy restriction in isolation have been observed to induce a decrease in both adipose tissue and skeletal muscle mass. Hence, this ultimately predisposes an individual to an unfavourable body composition. Sarcopenia, a condition characterised by the loss of skeletal muscle mass and function, can contribute to a sedentary lifestyle, ultimately leading to excessive weight gain. Aerobic exercise contributes to favourable alterations in systemic metabolism and diminishes adipose tissue, whereas resistance exercise preserves lean body mass. The existing body of research strongly supports the incorporation of both resistance and aerobic exercise as a supplementary approach to mild energy-restricted high-protein diets for the purpose of promoting healthy weight loss. This combination of interventions is considered a primary intervention for sarcobesity [24].

2. Conclusion:

Musculoskeletal pain exhibits a higher prevalence among the female population and demonstrates an upward trend during the peri- and post-menopausal stages. Not all musculoskeletal pain

can be classified as arthralgia, and it is important to note that not all instances of joint pain can be attributed to arthritis. During the menopausal transition, women experience a higher incidence of osteoarthritis (particularly in the hands) and rheumatoid arthritis. Individuals presenting with clinical manifestations and indications consistent with inflammatory arthritis, specifically rheumatoid arthritis, should be promptly referred to an early arthritis clinic for comprehensive evaluation and assessment. There is a dearth of conclusive evidence regarding the efficacy of menopausal hormonal treatment in the prevention or treatment of either type of arthritis. If the occurrence of joint pain, or inflammation of the joints, is in close proximity to the onset of menopause and other associated symptoms, it is justifiable to address potential reversible factors and other systemic symptoms related to menopause, while documenting the reaction of musculoskeletal symptoms to these interventions. Nevertheless, there is a paucity of research and a lack of randomised controlled trials (RCTs) specifically encompassing this cohort of symptomatic individuals. There remains a significant knowledge gap pertaining to musculoskeletal pain and arthritis during the menopausal period, necessitating further investigation into potential preventive and therapeutic approaches.

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