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PROSTHODONTIC REVIEW ON POSTMENOPAUSAL OSTEOPOROSIS

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Abstract

Osteoporosis after menopause is a growing public health concern that impacts bone health. It is characterised by weak and fracture prone bones. Women are nearly four times likely as men to be affected. The goal is to improve a proper prosthodontic therapy so that residual ridge resorption is reduced. The main concern are alveolar bone resorption and tooth loss or movement, to which osteoporotic women are three times more sensitive than those without condition. The goal of prosthodontic treatment should be to enhance prognosis by modifying the treatment plan to lower the strain on the alveolar ridge and thereby reduce progressive resorption.

This article provides an overview of prosthodontic considerations related to osteoporosis in postmenopausal women. over the other modalities of treatment once more.

Keywords: osteoporosis, postmenopausal, implant, bone mineral density

INTRODUCTION

Every year, there is evidence that the number of geriatric patients are increased. Osteoporosis is a metabolic illness characterised by a loss of bone mass and a reduction in the microarchitecture of bone tissues, resulting in increased bone fragility and fracture risk. WHO defined, Bone Mineral Density less than 2.5 standard deviation below that of a young adult BMD[2]. In half of postmenopausal women, osteoporotic fractures occur. In United States and Europe, about 30% of postmenopausal women have osteoporosis, however in India, the prevalence varies between 25% and 62%. The global ageing of populations has resulted in a significant increase in the incidence of osteoporosis[3].

Materials And Methods

A systematic literature search was carried out in a database in PubMed/Medline, Google Scholar

and was completed in October 2020. 'Osteoporosis', 'menopausal osteoporosis', 'osteoporotic prosthodontic treatment', 'bone mineral density', and 'dental implant' were among the key phrases. The title and abstracts of the research were used to determine which ones were eligible. For papers that were found to be inclusive after a review of abstracts, the whole text was utilised. This was followed by a manual search (checking references of relevant review articles and eligible studies for additional data). Any article that had not been published in English was disqualified.

Pathophysiology and Risk Factors

Ovarian function declines during menopause, resulting in lower estrogen production and a rise in FSH levels. The combined effects of estrogen deprivation and increase FSH production induce an imbalance in bone formation and resorption via messenger RNS gene expression[3]. Genetic makeup, nutrition, physical activity, body weight, age, estrogen deficiency, late menarche and sarcopenia, ovarian failure at a young age, cigarette smoking and alcohol are all risk factors[3].

Clinical Features

The most common clinical manifestations include vertebral or hip fractures. Scoliosis and kyphosis are worsened by spinal fractures because of bone height reduction. In the mandible, the cortex of the mandibular angle is resorbed and gets thinner, but in the maxilla, it is negligible in the alveolar crest[1,4]. Menopausal women had a higher prevalence and severity of TMDs than non-menopausal women[24].

Diagnosis and management

The measurement of BMD is aided by radiographic diagnostics. The Gonial index of the inferior mandibular cortex at the angle of jaw is less than 1mm, indicating osteoporosis. DEXA, FRAX, trabecular bone score, quantitative CT, spine CT and bone markers are other tests. Telopeptide, Ntelopeptide and C telopeptide are all bone resorption markers. Bone ALP osteocalcin is a bone formation marker. WHO osteoporosis diagnostic criteria- Normal ≥-1SD, osteopenia -1 to -2.5 SD, osteoporosis ≤-2.5 SD[4].

Specifically, lifestyle changes combined with physical activity that increase skeletal system mechanical performance. Calcium intake in the diet (1000-1500mg) and prevention of fall is important. According to Barone, 60% reacted well to dietary correction with vitamin supplements, 35% to estrogen therapy and 5% required psychological assistance. A calcium rich diet followed throughout adulthood can help to prevent and even reverse osteoporosis[5]. Bisphospohonates are used to treat glucocorticoid induced osteoporosis, enhance bone mass in male osteoporosis and prevent and treat postmenopausal osteoporosis[13]. Pharmacotherapy includes antiresoprtive drugs like bisphosphonates denosumab, anabolic agents like teriparatide. Newer drugs include abaloparatide and romosozumab[4].

Prosthodontic Considerations

The goal of prosthodontic treatment is to alleviate bone stress. A multidisciplinary approach to prosthodontic treatment involving a prosthodontist, gynaecologist, orthopaedic surgeon, psycologist and nutritionist results in a favourable outcome and improved patient quality of life[20]. Bandela et al stated that reduced biomechanical loading on bone,decreases tensions within bone, resulting in resorption within bone and its periosteal surface[1].

Removable dentures

All edentulous people undergoing rehabilitation should be screened for osteoporosis on regular basis. While making impression, selective pressure impression technique, mucostatic or open mouth techniques are used to lessen mechanical forces. Periodic evaluation may require more frequent denture modifications[15]. In edentulous subjects

6 months after denture placement, osteoporotic patients had a higher RRR and lower masticatory ability and efficiency. Teeth having a limited buccolingual width, such as semi anatomic and non-anatomic are preferable. Optimum use of soft liners and extended tissue interval are advised. Bhatia et al described a personalized metal plate with a looping metal design that minimised burning sensations, allergic reactions and microbial colonisation[16].

Fixed dentures and Implants

FPD will hasten bone loss in periodontally compromised abutments, as a result FPD fabrication should come after osteoporotic treatment[1]. For patients with osteoporosis, implant therapy is not contraindicated, however surgical technique and osseointegration should be properly planned[11,14]. The treatment plan for surgical method, healing period and loading are all influenced by bone density. Implants with a wider width and hydroxyapatite improve bone contact and density[18]. Without hormone replacements, postmenopausal women have a high failure rate. Implant supported overdentures provide greater masticatory forces and consequently mandibular stress than traditional dentures. Calcitonin and bisphosphonates are both indirect inhibitors of bone resorption and play a role in bone repair and maturation. Cap modified implant along with PRP could improve osteoinductive effect, resulting in better bone and implant interface stabilization[25]. The simvastatin-Sr-HA coatings would be useful in patients with osteoporosis who have poor bone quality[28]. According to findings, implant therapy is a decisive treatment method for improving the quality of life in osteoporotic patients by increasing function and esthetics[30].

Discussion

Burning mouth, atrophic mucosa, impaired taste sensitivity, osteoporosis, periodontitis and recurrent infections in denture wear in post-menopausal are all signs of menopause. The situation of missing teeth replacement is a serious one. Prosthodontic treatments should be performed in such a way that bone tension is reduced, resulting in resorption. Sugar-free chewing gums and sialagogues can help with xerostomia. It is necessary to maintain proper dental hygiene. For people with burning mouths, a metal denture base provides an alternative to acrylic dentures[20]. To avoid tissue stress, the denture must be polished smooth. Flexible dentures or reservoir dentures are two options. Bone loss and weakening might damage the ridges that keep dentures in place, resulting in ill-fitting dentures. To avoid prolonged irritation, denture adjustments can be made. In osteoporotic women, oestrogen treatment can help to prevent severe bone demineralization[18]. For a proper treatment plan, an interdisciplinary strategy involving gynaecologist, orthopeardic surgeon, psychologist, nutritionist and prosthodontist can be used[20]. Surface treated implants, such as those coated with hydroxyapaptite, can be utilised to boost bone density. In osteoporotic patients, proper treatment planning for dental implants can help improve osseointegration.

Conclusion

Menopausal oral manifestations are underscored by current female demographic trends. Tooth movement, alveolar bone resorption and TMJ disorders are all major concerns for osteoporotic individuals. Definitive diagnosis, treatment planning and management are all required.

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