

Physical Therapy Interventions and Bone Health: A Short Commentary

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Abstract

Risk of osteoporosis is increasing in normal population due to inactivity, dietary eating habits, and sedentary life styles, low calcium intake, less exposure to sun light and hormonal changes. Physical therapy interventions, weight bearing training, jumping intervention in childhood and adolescence, modified step aerobics training, balance training, strength training and water based exercise can be used for treatment and prevention of osteoporosis.

Keywords: Bone; Density; Osteoporosis; Weight bearing training; Balance training; Strength training

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Received: July 01, 2017; Accepted: July 22, 2017; Published: July 28, 2017

Introduction

Risk of osteoporosis is increasing in normal population due to inactivity, dietary eating habits, and sedentary life styles, low calcium intake, less exposure to sun light and hormonal changes. This risk is increased with disorders like stroke, eating disorders, cancer, gastric diseases and person with medications like steroids. Osteoblastic and osteoclastic activities run in normal bone in a balance. When this balance is shifted towards the osteoclastic activity, then there is more bone resorption and bone mineral density is compromised.

Physical therapy interventions

By physical activity, daily exercises and healthy diet can prevent or postpone the osteoporotic changes. Different interventions have been used over the time to prevent osteoporosis in older individuals. Risk of falls also increased in older individuals.

Weight bearing training

Weight bearing training activity can reduce risk of falling, fracture in older individual [1]. Weight bearing exercises also increase muscle strength and neuromuscular control in older individuals. A recent study that published in 2017 was conducted on patient with hemiplegia, in this study they concluded that a minimum 60 minutes weight bearings in males and 90 minutes weight bearing in females is required to stimulate the bone mass density and reverse the secondary osteoporosis after hemiplegia [2].

Jumping intervention in childhood and adolescence

Different activities in jumping can be induce early in children and adolescence to postpone the effects of aging and osteoporotic changes. Recently a systematic review was conducted on jumping activities and school activities in children and they concluded that these type of intervention should be implemented in early stages of life to increase bone mass in early years of life [3].

Modified step aerobics training

Aging is associated with decrease bone mass density, decrease neuromuscular control and decrease strength in muscles. Aerobics training can be used to control these effects of aging. Modified step training can be design for older individuals. Modified step aerobics training can be used to neuromuscular adaptation and to increase the bone mass density [4].

Balance training

Human balance training is controlled by complex system that includes a central commanding system (brain), muscles, and neuromuscular system. Dual and multitask training activities can

be used to increase the bone mass density in older individuals. Balance training can increase physical activity in older individuals with osteoporosis [5].

Strength training

Strength training has been remaining an effective intervention to increase muscle strength, increase bone mass density in all groups. Maximal strength training improves bone mass density [6,7].

Water based exercise on bone health

A systematic review was conducted on middle age postmenopausal women in which effects of water based exercises were explore on bone health and they concluded that WBE may have benefits with respect to maintaining or improving

bone health in postmenopausal women but less benefit when compared to LBE. Further research is required on this topic [8].

Conclusion

Aging is associated with osteoporosis. Physical activity and physiotherapy interventions can be used for treatment and also for prevention. Risk of osteoporosis is increased with inactivity, stroke and chronic diseases. Bone loading is an effective way of bone nutrition and osteobalstic activities. Physical therapy interventions, weight bearing training, jumping intervention in childhood and adolescence, modified step aerobics training, balance training, strength training and water based exercise can be used for treatment and prevention of osteoporosis.

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