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Finger Millet (Ragi): A Nutritional Boon for Osteoporosis

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Abstract:: Background: Osteoporosis is a progressive bone disease that is characterized by a decrease in bone density. A serious concern should be taken on osteoporosis. Because of the dormant properties of the disease, it is hard to recognize the symptoms until fracture occurs. In Ayurveda, this depletion of the bone tissue is called Asthikshaya. This is due to nutrient deficiency because of malnutrition and imbalance of Vata dosha[1,2]. To prevent osteopenia and osteoporosis, calcium and vitamin D supplements are required. Diet-based calcium supplement would be more acceptable and easier to practice. Finger millet (ragi, Eleusine coracana) is a good source of calcium and phosphorus and easily digestible.[3,4]Ragi is a good source of natural calcium. It helps in strengthening bones and also helps to balance Vata. This reduces the risk of Osteoporosis. Aim of study: 1.to recognize the importance of millets and 2.to introduce the Ragi as a best source of calcium. Conclusion: To maintain healthy life it is essential to promote nutritious diet to encourage healthy ageing and prevent early onset of chronic diseases. Various studies have shown that consumption of nutraceutical foods may provide greater health benefits. Ragi (Eleusine coracana) having nutraceutical properties, is the oldest cereal grain in India having strongest power to strengthen the bone.
Keywords: Osteoporosis, Finger millet, Ragi, Eleusine coracana

I. INTRODUCTION

Osteoporosis is a progressive bone disease representing a major public health problem characterized by low bone mass, deterioration of bone tissue and disruption of bone architecture, compromised bone strength, and an increase in the risk of fracture. Osteoporosis affects an enormous number of people.

Worldwide, osteoporosis causes more than 8.9 million fractures annually, resulting in an osteoporotic fracture every 3 seconds. Population based studies in India show prevalence of osteoporosis in male as 3% and female as 8% ICMR report [5]. It means women have higher chances of developing osteoporosis. Osteoporosis is estimated to affect 200 million worldwide.Lower the education and income the higher the incidence of osteoporosis .

In Ayurveda, the depletion of the bone tissue is called Asthikshaya. This is due to nutrient deficiency because of malnutrition and imbalance of Vata dosha. Instead of taking pharmaceutical drugs food supplemented with required nutrients (calcium and vitamin D3) could help to overcome osteoporosis. Millets are minor cereals of the grass. They are small seeded, annual cereal grasses, many of which are adapted to tropical and arid climates and are characterized by their ability to survive in less fertile soil (Hulse, Laing, & Pearson, 1980). Millets include sorghum (Jowar), pearl millet (Bajra), finger millet (Ragi), foxtail millet (Kakum), proso millet (Chenak), little millet (Kutki), kodo millet (Kodon), barnyard millet (Sanwa),and brown top millet.Ragi or finger millet is a good source of natural calcium. It helps in strengthening bones and also helps to balance Vata. This reduces the risk of Osteoporosis. To maintain healthy life it is essential to promote nutritious diet to encourage healthy ageing and prevent early onset of chronic diseases. Various studies have shown that consumption of nutraceutical foods may provide greater health benefits.Finger millet or ragi (Eleusine coracana) having nutraceutical properties, is the oldest cereal grain in India which is fairly grown in extreme climatic conditions such as dry soil and poor fertilizers. The few available studies show that finger millet provides high calcium bioavailability, and contributes to higher calcium retention due to its calcium content compared to other staples and reduced bone resorption, hence can exert beneficial effects especially for children, the elderly, and women.

A. Finger Millet (Ragi)[6,7]

Finger millet is an annual plant widely grown as a cereal in the arid areas of Africa and Asia. It is grown with minimal water resources without irrigation pesticides with higher dietary fiber contents, several micronutrients and phytonutrients. It is referred as "poor people's crop" as it provides high quality nutrition at a low price. It is also known as Madua or finger millet or nachni or rollu or sattemaw.

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Properties of Finger millet:
Rasa-Tikta,Madhur,Kashaya
Veerya- Ushna
Vipak- Madhur
Guna- Ruksha , Laghu
Action on doshas- Balances kapha ,increases vata and pittain excess
Karma-Pittahara, Raktadoshahara,Rasayana, Hrrudya
Parts used- Seed

B. Therapeutic Value

Ragi is rich in calcium (0.34%) which helps in strengthening bones. It is an excellent source of natural calcium for growing children and people. It is thirty times more than that of rice and wheat (Srivastava and Sharma 2012). Ragi consumption helps in development of bones in growing children and maintenance of bone health in adults. Ragi keeps disease such as osteoporosis at bay and could reduce rick of

Also it is rich source of dietary fibre (18%), phytates (0.48%), protein (6%-13%), minerals (2.5%-3.5%) and phenolics (0.3%-3%). Also, it has good amounts of thiamine, riboflavin, iron, methionine, isoleucine, leucine, phenylalanine and other essential amino acids. The abundance of these phytochemicals enhances the nutraceutical potential of finger millet, making it a powerhouse of health benefitting nutrients.It has distinguished health beneficial properties, such as blood glucose and cholesterol lowering, wound healing, antioxidant, antibacterial properties ,anti-diabetic (type 2 diabetes mellitus), anti-diarrheal, antiulcer, anti-inflammatory, atherosclerogenic, and antimicrobial properties (Chandra et al., 2016).

Food containing high calcium, potassium, magnesium with vitamins and other minerals, phosphorus, iron, and zinc are preferable for the normal bone metabolism to control osteopenia and osteoporosis.

II. DISCUSSION

Osteoporosis is a global public health problem currently affecting more than 200 million people worldwide. Population based studies in India show prevalence of osteoporosis in male as 3% and female as 8% ICMR report .

Now it is an established fact that the whole world is facing many health challenges because of fiberless foods. It is also clear to patients that all the lifestyle diseases can be made to disappear just by eating millets and removing refined foods .To prevent the risk of developing osteoporosis one should eat a well-balanced diet. There is an increasing trend in research, focusing on the application of alternative grains such as ragi (finger millet) which is potentially healthy to prevent the increasing calcium deficiency among individuals. Finger millet being a low cost millet with higher dietary fiber contents, several micronutrients and phytonutrients with practically no reports of its adverse effect, deserves attention.

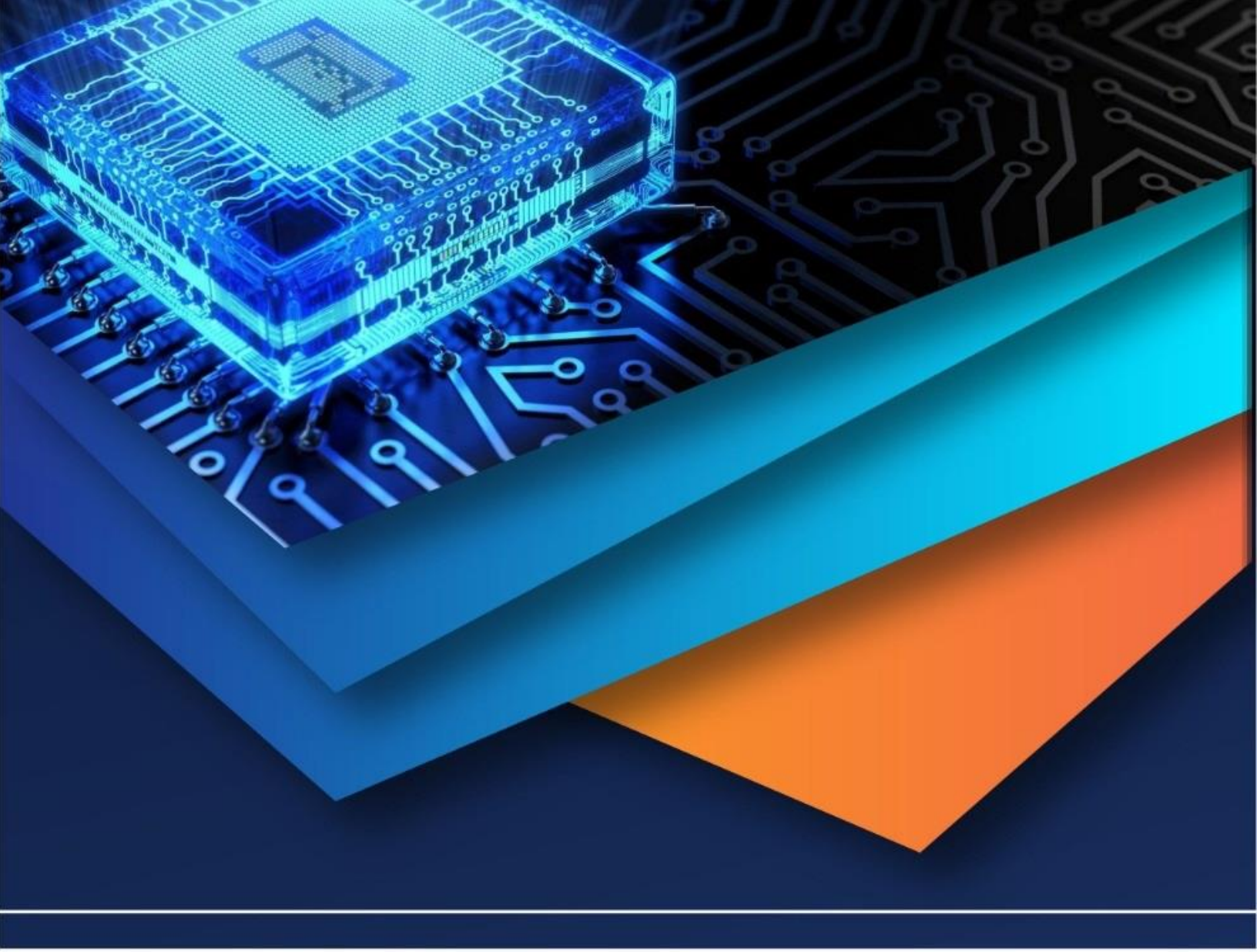
III. CONCLUSION

Most of the civilized people have not even heard about millets and much less understand the benefits of millet nutrition. As modern medicine contain inorganic calcium compounds such as calcium carbonate, calcium citrate etc which may be of modest bioavailability and can have undesirable effects such as kidney stone formation, constipation, etc and as the high levels of calcium in finger millet and the positive results in the existing studies hold a promise for health benefits associated with finger millet integration into more diets and programs.There is a need for generating science-based evidence on its potential for improving bone mineral mass and other functions in the body.

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