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EARLY OSTEOPOROSIS CAUSED BY USAGE OF NICOTINE (SMOKING AND CHEWING) IN POSTMENOPAUSAL WOMEN IN RURAL ANDHRA PRADESH

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ABSTRACT Nicotine use in any form (chutta is tobacco leaf smoking, chewable forms like khaini, gutkha), studied in 120 postmenopausal women in 2 districts of Rural Andhra Pradesh state viz., Srikakulam and Vizianagaram revealed in causation of early osteoporosis compared to non-users of nicotine, even second hand smoking also affected womens health. Nicotine use in any form (smoking,chewable forms) showed reduced levels of estrogens in postmenopausal women. Inverse relationship exists between nicotine users and in the serum estradiol levels. Among nicotine users in any form there was increased hepatic clearance of estrogens in postmenopausal women contributing to enhanced risk of osteoporosis.

KEYWORDS : Nicotine Usage Forms (chutta Smoking, Chewable Nicotine Like Khaini , Gutkha)—decreased Serum Estrogens – Increased Risk Of Early Osteoporosis In Postmenopausal Rural Women.

MATERIAL AND METHODS:

Our study selected 120 participants of healthy postmenopausal women from 2 districts of rural Andhra Pradesh between ages 48 to 60 yrs and were medically screened for diseases like diabetes, hypertension, lungs disease, endometrial, cervical and breast cancers. Participants with these were not included. The subjects had passed menopause 1 to 5 yrs before inclusion in the study. None had received previous exogenous hormone (ERT therapy). Nicotine usage records were obtained by questionnaire (per day consumption of khaini, gutkha and chutta smoking). In these three months study in 2019, were monitored with frequent medical checkups for development of new diseases like diabetes, hypertension, COPD , endometrial and breast diseases. Before, during and after end of studies all participants were subjected to clinical, biochemical (serum estradiol, estrone) and gynecological examinations. Participants were examined every month. Written consent was obtained, and study approval granted by ethics committee. Participants height and weight were measured., bone mineral content was calculated from the distal forearms, total serum calcium measured. By definition a smoker was anyone who smoked in the previous 3- 4 months, a nonsmoker was anyone who had not smoked for at least 6 months. Among postmenopausal women studied 80% classified as nicotine users and they smoked 3-4 chuttas and chewed 4 -5 khaini and gutkhas per day. Serum estradiol and estrone were measured in all participants. Blood samples were taken in the morning after 8 hrs fasting between Day 15 and Day 22 with complete tobacco abstinence. Statistically evaluated by t-test and chi-square tests.

Analysis Of Results :

Body weight and height were significantly lower in nicotine users than in the nonusers (see table 1). Serum values of estradiol were lower in nicotine users compared to non- users ($P < 0.05$). Chi-square test was significant with respect to serum estradiol ($P < 0.01$) and estrone ($P < 0.01$). The effect of nicotine on bone mineral content was studied, and it was significantly lower than the corresponding non- users of nicotine.

DISCUSSION:

WHO defines Osteoporosis as reduction in the strength of bone causing increased risk of fractures and is featured by decreased bone mineral especially among postmenopausal women, manifested as vertebrae and hip fractures. Nicotine usage in any form in postmenopausal women have decreased bone density and produced early menopause. Smoking decreases blood supply to bones, impair absorption of calcium ,vitamin D and induces hyperadrenocorticolism. In nicotine users RANK-RANKL-OPG (osteoprotegerin) pathway plays key role with enhanced activation of osteoclastogenesis and results in poor bone health. Postmenopausal women with a T-score of <-1.0 are at increased risk of osteoporosis. Nicotine inhibits bone mineralization by osteoblasts and also increase number of osteoclasts which facilitate resorption of bone pits . Osteoporosis increases with early menopause and advancing age due to loss of ovarian function. Many times osteoporosis is not discovered until weak bone cause painful fractures in back and hips. Most individuals are asymptomatic. Early osteoporosis is defined as osteoporosis before 45 years of age and revealed by estimating bone density by DXA and SXA tests. Other risk factors for osteoporosis are age, family history of fractures, low body weight (less than 50 kgs), less physical activity, nicotine ,alcohol consumption and early menopause. In the increasing order osteoporosis affects hips, vertebrae and forearms. Any fracture in individual over the age of 50 viewed with respect to, developing osteoporosis. In our study of 120 participants of postmenopausal women there was estrogen deficiency (see table 2), low calcium intake, and inadequate physical activity, and poor nutrition. Low estrogen profile seen in postmenopausal women in nicotine users in any form with added menopausal deficiency of estrogens.

Bone mass measurement with T-score and Z-score: In a 60 years old women Z score of -1, a T score below -2.5 in lumbar spine, femoral neck or hip is taken as a diagnosis of osteoporosis , moreover breast cancer may be less frequent among smokers due to low estrogens.

In *SUGGESTION* we advise adequate intake of calcium (1000 mg per day), 400 I.U of vitamin D, dietary phytoestrogens, adequate physical activity, increased use of dairy products and avoidance of nicotine in any form (by smoking or chewable forms) and pharmacological use of 3rd generation SERMS (Bazodoxifene) , bisphosphonates and Denosumab to prevent or delay the developing osteoporosis.

Table 1 Bone Mineral Content In Nicotine Users:

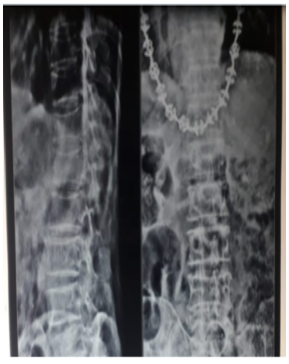
Bone mineral content (arb units)	Smokers (n 120) nicotine & chewable tobacco 36	Non smokers (n 90) 39
weight (kgs)	55 *	68
height (cms)	147 *	158

*Significance Of Difference : P < 0.001

Table 2

	Normal post menopausal values	Values in postmen opausal women – nicotine users
Serum estrone	130 pmol/L	80 pmol/L
Serum estradiol	74 pmol/L	36 pmol/L

Fracture risk increases when serum estradiol < 20pmol/L or < 5 pgm/ml



Osteoporosis of lumbar vertebrae

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