A COMPARATIVE STUDY ON SERUM MEAN CALCIUM, PHOSPHORUS LEVELS AND BEVERAGES INTAKE, AND OSTEOPOROSIS IN SELECTED POST-MENOPAUSAL WOMEN OF THANJAVUR DISTRICT

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Abstract
In Women, Menopause is a Physiological Phenomenon with total absence of Oestrogen in Blood. Osteoporosis is almost two-third of the Post-menopausal Women . A Comparative Study between serum mean calcium, Phosphorus and Beverages intake and Osteoporosis in Selected Post-Menopausal Women of Thanjavur District, Tamilnadu attempted. 100 Women age group of 55-65 years were selected.(50 non-osteoporotic women-control group, 50 osteoporotic women-study group). Questionaire method adopted for Data collection. Study revealed Diet related factors play a prominent role in Osteoporosis Development. Lack of Exercise, inadequate intakes of Calcium, Vitamin D and Leafy Vegetables and Excess intakes of P and Beverages like Coffee and Tea complicated the problem. It could be strongly concluded that Nutritional practices can prevent or help to manage Osteoporosis.

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Key Words: Menopause, Post-menopause, Calcium, Vitamin D, Osteoporosis

INTRODUCTION
Menopause is an unavoidable change that every woman will experience, assuming she reached middle age and beyond. It is helpful if women are able to learn what to expect and what options are available to assist the transition, if that becomes necessary. Menopause has a wide starting range, but can usually be expected in the age range of 42-58. An early menopause can be related to cigarette smoking, higher body mass index, racial/ethnic factors, financial strain, illnesses, chemotherapy, radiation, and of course the surgical removal of the uterus and or both ovaries (Fujita et al., 2001).

Postmenopause is all of the time in a woman's life that take place after her last period, or more accurately, all of the time that follows the point when her ovaries become inactive. A woman who still has her uterus (and who is neither pregnant nor lactating) can be declared to be in postmenopause once she has gone 12 full months with no flow at all, not even any spotting. When she reaches that point, she is one year into postmenopause. The reason for this delay in declaring a woman postmenopausal is because periods are usually extremely erratic at this time of life, and therefore a reasonably long stretch of time is necessary to be sure that the cycling has actually ceased completely. At this point a woman is considered infertile, and no longer needs to factor in the possibility of becoming pregnant. However the possibility of becoming pregnant has usually been very low (but not zero) for a number of years before this point is reached (The North American Menopause Society, 2010).

Women’s health is of utmost importance at every stage of her life cycle. This is because several physiological changes take place from birth to old age necessitating careful nutritional monitoring. Also women have crucial role in the family as caretakers and income generators. It is important that women in the post-menopausal age should carry on normal activities without any inconveniences due to their hormonal changes. Thanjavur District of Tamil Nadu is predominantly agriculture oriented and economically quite backward. The investigator having observed women during several occasions felt the need to study the age related problem which would be stepping stone for further developmental activities (Notelovitz et al., 1991).

Osteoporosis is a major public health threat of 25 million Americans, 80 per cent of women. One out of every two women and one in eight men have an osteoporosis related fracture. Osteoporosis affects from 15-
20 million people including one out of every three people over the age of 65. It is eight times more prevalent in women than in men (Thorney, 1989). Race-Anglo-Saxon women have a higher incidence of osteoporosis than other women (Smith et al, 1960) and Urist et al, (1998) revealed that virtually 100 percent of the women and 85 per cent of the man 65 years of age and older show osteoporosis of slight moderate or marked degree. In the present study the examined serum mean calcium, Phosphorus and Beverages intake and Osteoporosis in Selected Post-Menopausal Women of Thanjavur District, Tamilnadu

MATERIALS AND METHODS

Selection of Area
The investigator selected Thanjavur district for conducting the study. The study was conducted in the Raja Mirasudarar Government Medical College Hospital, Thanjavur. This area was selected as it was observed that there were many cases of osteoporosis coming to the hospital for treatment.

Selection of Subjects
Sample Size
100 subjects in the age group of 55 to 65 years, both working and non-working were selected. Convenience sampling method was used as the study involved an extensive data collection. None of the selected subjects were on any hormone replacement therapy. The subjects were categorized into 50 osteoporotic post-menopausal who came to the hospital for the first time and 50 normal post-menopausal women from the three nearby villages of Palayam, Perikarappankottai and Ammapettai in Thanjavur District. The selected normal 50 subjects were free from any other diseases like diabetes, hypertension, cardio vascular diseases and infections.

Formulation of Questionnaire
In order to collect information from the selected subjects a questionnaire was formulated. The questionnaire included questions recording with name, age, sex, marital status, educational status, family income and expenditure pattern, health status, food habits and dietary practices, frequency of food consumption and nutrient intake by the 24 hours food intake recall method, nutritional assessment of subjects through anthropometrical measures, clinical assessment and diagnostic information pertaining to osteoporosis.

Biochemical Analysis
The calcium level in the serum was estimated by Titrmetric method of Clark and Collip (1926). Serum inorganic phosphorous was determined by method of Fiske and Subbarow (1925).

RESULTS AND DISCUSSION
Osteoporosis commonly known as soft or brittle bones, refers to increased porosity of bones. Abnormal porosity of bones in older people usually results from nutritional deficiencies and the body’s inability to absorb and utilize nutrients. Prolonged deficiency of calcium and vitamin D in particular leads the skeleton to become demineralized and shrunken because of calcium losses during pregnancies and menstruation, the disease is far more prevalent in women than in men (Bakhru, 2000). Age distributions of selected subjects are tabulated in Table 1.

Table 1 indicates that majority of the selected subjects, 58 percent in the osteoporosis group and 62 percent in the control group were between 55-60 years of age, 42 percent of the osteoporosis group and 38 percent in the control group were belong to the age group of 60-65 years.

Osteoporosis is debilitating disease that is primarily age and gender related, afflicting more than 60 per cent of women between the ages of 55 and 64 and even higher percentage with older age groups (Williams 1999). Tables 2 represent the calcium and phosphorous level in control and Osteoporosis group.

Serum Calcium
Calcium and inorganic phosphate are the major constituent of bone and have reciprocal relationship. Calcium in serum is seen in ionized form or as a complex with protein or other inorganic substances. Parathyroid hormone and vitamin D affect serum calcium levels. Low serum calcium levels are associated with renal problems, rickets and osteomalacia. Serum calcium is associated with parathyroid diseases, vitamin D imbalances, bony problems and cancerous conditions (Deb, 1999).

Nearly 70 per cent of the subjects in the osteoporosis group and 50 per cent of the subjects in the control group had a serum calcium level ranging from 10-12 mg/100ml 30 per cent of the subjects in the osteoporosis group and 50 per cent of the subjects in the control group had a serum calcium level ranging from 8-10 mg/100ml. ‘t’ test was determined to find whether there is any significant difference in the mean serum calcium levels of osteoporosis and control groups. The “t” value was found to be 0.82. Hence it may be inferred that there is not significant difference between control and osteoporosis groups.

Serum calcium levels in both the osteoporosis and control group was found to be within the normal range of 9-11 ml/dl. The recommended dietary allowances (RDA) of calcium for women from menopause onwards have been increased to 1200mg/day as a result of recent research (Jacks, 1999).

Serum Inorganic Phosphorus
Sixty per cent of the subjects in the control group had 3-4 mg/100 ml of inorganic phosphorous. Seventy per cent of the subjects in the osteoporosis group and 40 per cent of the subjects in the control group had 4-5 mg/100 ml of phosphorus. Nearly 30 per cent of the subjects in the osteoporosis group had 5-6 mg/100 ml phosphorus. “t” test was determined to find out whether there is any significant difference in the mean serum inorganic phosphorus values are osteoporosis and control groups. The “t” values was found to be 5.96 which is significant at one per cent level. Hence it may be referred that there is significant difference between osteoporosis and control groups in their mean serum inorganic phosphorus levels.

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Serum inorganic phosphorus is a small but significant form of phosphorous present in the blood. It is excreted through the urine. The reabsorption is inhibited by parathyroid hormone. Thus it is essential with calcium metabolism (Deb, 1999). In the present study there was a slight elevation of serum inorganic phosphorus (mean 4.85±0.25 mg/100 ml as compared to the normal value of 2.5 – 4.5 mg/100 ml. In the human body, phosphorus occurs as the salt phosphate, which exists as inorganic phosphate or is coupled with other minerals or organic compounds. Phosphates are extremely important in human metabolism. About 80-90 per cent of the phosphorus in the body combines to form calcium phosphate, which is used for the development of bones and teeth (Andress et al. 1987). Extensive diet surveys carried out in different parts of our country both in the rural and urban areas indicate that diets are predominantly based on cereals. Diets of poor income groups are deficient in several nutrients, namely, energy, vitamin A, Calcium, riboflavin, iron (Gopalan et al., 1993).

Therefore from the study it can be concluded that the diet related factors had a prominent role in the development of osteoporosis. Lack of inadequate intakes of phosphorus complicated the problem. It may be emphasized that correct nutritional practices can prevent or help to manage osteoporosis.

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Reference


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