Correlation between Bone Mass Density and Thyrotropin Hormone in Postmenopausal Women

***Arindam Bose, ** Dr. Dhananjay.S.Chitnis, ***Nanda Hemvani**

Abstract

Hypothyroidism is one of the common endocrine disorders worldwide. In postmenopausal women osteoporosis is also a biggest threat along with this disorder. Thyroid hormones physiologically take active part on bone remodeling. Thyrotropin (TSH) is a peptide hormone secreted from the pituitary to regulate these hormones' synthesis. So, it is important to find out correlation between Bone Mass Density (BMD) and serum TSH value in postmenopausal women. Present study conducted on 73 postmenopausal women and their BMD and serum TSH values are evaluated using Heal Ultrasound method and Chemiluminescent Microparticle Immunoassay method respectively. In present study, no significant correlation was found between these two parameters. Out of 18 hypothyroid subjects, 9 were supplemented with exogenous thyroxine where rests were not. There was no osteoporotic subject found in those nine thyroxine supplemented subjects; on the contrary, 3 cases of osteoporosis were detected in rest 9 untreated subjects. The present study was conducted on a small population so; there is a scope for further research on this topic.

Key Words: Postmenopausal women, Osteoporosis, Hypothyroidism, Bone Mass Density, Thyrotropin.

Background

The thyroid gland is the largest of the organs that function exclusively as an endocrine gland, weighing about 20g in an adult. Thyroid function itself is controlled by "Thyroid-Stimulating Hormone" (TSH, or "thyrotropin"). TSH is a large protein hormone secreted from the pituitary gland that binds to specific membrane receptors on thyroid cells and activates a biochemical pathway that stimulates thyroid hormone production and secretion **(Taurog A 2004)**[1]. The amount of TSH stimulation required to maintain blood levels of thyroid hormone within a "normal" range is controlled by a negative feedback relationship between serum T_4 and serum TSH **(Larsen PR *et.al*. 1981)**[2]. The negative feedback action of T_4 occurs both at the level of the hypothalamus **(Vella KR *et.al*. 2009)**[3] and pituitary **(Wan W *et.al*. 2005)**[4].

Osteoporosis is a progressive bone disease that is characterized by a decrease in bone mass and density which can lead to an increased risk of fracture **(Alldredge BK *et.al.* 2009)**[5]. As of 2013 there is insufficient evidence to determine if supplementation with calcium and vitamin D results in greater harm or benefit in men and premenopausal women. Low dose supplementation (less than 1 g of calcium and 400 IU of vitamin D) is not recommended in postmenopausal women as there does not appear to be a difference in fracture risk **(Moyer VA 2013)**[6].

Need of the Study & Literature Review

Thyroid dysfunction is defined as altered serum TSH level with normal or altered level of serum T_3 and T_4 level **(Peter PAS *et.al.* 2009)**[7]. The spectrum of thyroid disease varies from underactive thyroidism (hypo) to overactive (hyper) thyroidism. It is a common endocrine disease reported worldwide and leads to major consequences of the human body, if left untreated. Post menopausal hypothyroidism and osteoporosis both are very common

***Ph.D Student,** DAVV, Indore, Email: arindam.bose7184@gmail.com. Mob.9329186503*

**** Professor and Head,** Department of Pathology, Choithram Hospital and Research Centre, Email- ds_chitnis@rediffmail.com*

****** Consultant,** Department of Pathology, Choithram Hospital and Research Centre, Indore (M.P.)*