Potential new target for reducing osteoporosis risk in men

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Researchers have identified a new regulator of vitamin D metabolism that could be targeted to reduce the risk of osteoporosis in men undergoing prostate cancer therapy, according to a study published in the *Journal of Molecular Endocrinology*. Reduced levels of sex hormones in men, caused by prostate cancer therapy can lead to lower vitamin D levels, which in turn increases the risk of bone fractures. This study has identified a previously unknown link between male sex hormone levels and vitamin D that may have future therapeutic value for treating related deficiencies of the vitamin.

The male sex hormones, or androgens, in addition to regulating male sexual development, are also involved in maintaining balance in other body processes, including metabolism. Lower levels of androgens have been associated with an increased risk of bone fracture and the development of osteoporosis in men. Androgen levels in men may be reduced by a variety of factors including normal aging or by some drug treatments, including prostate cancer therapy. Since prostate cancer affects approximately 1 in 9 men and vitamin D deficiency is known to be a common risk factor for bone fractures and developing osteoporosis, the present study aimed to further investigate the link between changes in androgen levels and normal vitamin D function.

Dr Eui Ju Hong and colleagues at Chungnam National University, investigated the effects of increasing or decreasing male sex hormone levels on several different markers of vitamin D function, in cell culture and experimental mouse models. The team found that a deficiency of

male sex hormones correlated with increased levels of an enzyme that inactivates vitamin D, which reduces its normal activity. Their work showed that levels of this enzyme increased in the presence of another protein - the progesterone receptor .These receptors directly increase the levels of the vitamin D inactivating enzyme when androgen levels are low, and therefore could be a new target for treating vitamin D deficiency in patients with low androgen levels.

Dr Eui Ju Hong comments, "Reduced sex hormone levels may be caused by normal aging or antihormone therapy used to treat prostate cancer, so this discovery opens up new avenues for tackling vitamin D deficiency in affected men. Vitamin D supplements may be more effective if combined with progesterone receptor blockers, which could reduce the risks of bone fractures and other related complications."

Dr Hong and his team are now interested in investigating how this previously unknown role of progesterone receptors may affect vitamin D metabolism in women, particularly during pregnancy.

Dr Hong, states, "Vitamin D deficiency in pregnancy is linked to a higher risk of complications including abnormal bone growth of the baby, diabetes and low birth weight. We know that progesterone receptor levels are increased during pregnancy, so this finding may have important health implications for the effectiveness of vitamin D supplements in pregnant women, particularly those at higher risk."

Provided by Society for Endocrinology