

عنوان المشروع باللغة العربية	
عنوان المشروع باللغة الإنجليزية	Screening for biochemical markers of bone turnover in postmenopausal Osteoporotic Saudi Subjects
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التخصص الدقيق للمشرف الرئيس	الكيمياء الحيوية
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المدة المتوقعة لإنجاز البحث منذ الحصول على موافقة عمادة الدراسات العليا	شهر 12
Abstract or synopsis of the proposal (200 words or less):	<p>Osteoporosis is a common systemic disease of the skeleton that is characterized by a reduction of bone mass and a concurrent deterioration in bone structure. Consequently, the bones become more fragile and there is an increased risk of fractures. The underlying mechanism in all cases of osteoporosis is an imbalance between bone resorption and bone formation. The current evidence suggests that osteoporosis is caused by a complex interaction between genetically predisposing factors (i.e., variations in DNA sequence) and environmental factors, such as diet, lifestyle, physical exercise and smoking. During the past decade considerable progress has been made in the identification and characterisation of specific biomarkers to aid the management of metabolic bone disease.. Recently, biochemical bone turnover markers (BTM) have been employed to accurately and non-invasively assess decomposition and anabolism of bone tissues, thus providing an indication of osteoblast and osteoclast activities in bone remodeling critical to differential diagnosis of osteoporosis, assessment of bone fracture risk and effect evaluation of anti-osteoporosis therapy . Reliable reference ranges for acceptable BTM, however, have not been developed for Saudi patients. Because Bone formation markers (e.g., osteocalcin, bone specific alkaline phosphatase) and bone resorption markers (type I collagen cross-linked N-(NTX), C-telopeptide (CTX), total pyridinoline and free deoxypyridinoline) are key markers for differential diagnosis and therapeutic evaluation of osteoporosis, establishment of standard reference ranges for these BTMs is of great clinical importance. Since Osteoporosis is common in postmenopausal women due to estrogen deficiency, this study will be conducted in order to establish a set of comprehensive standard</p>

	<p>reference ranges for N-(NTX) and CTX levels in postmenopausal Saudi females and age matched healthy controls. Furthermore, the effect of location and latitude, body weight and circulating levels of some hormones and cytokines will be assessed. This study would provide a key preliminary step to establishment of internationally recognized standards for BTMs for use in Saudi osteoporosis prevention and treatment strategies.</p>
<p>Hypothesis or scientific justification of the proposal</p>	<p>Screening for biochemical markers of bone turnover will facilitate the pre-diagnosis, screening, and better management of the disease in Saudi population to avoid the medical and economic hardship of the families and hence will have positive impact on the economy and society in the kingdom of Saudi Arabia.</p>
<p>Specific objectives</p>	<p>(1) To investigate the relationship between bone mineral density (BMD) and the biochemical markers of bone turnover in the Saudi population. Bone formation markers (e.g., osteocalcin, bone specific alkaline phosphatase) and bone resorption markers (type I collagen cross-linked N-(NTX), C-telopeptide (CTX), total pyridinoline and free deoxypyridinoline)</p> <p>(2) To investigate the relationship between osteoporosis and the serum levels of cytokines and hormones. The serum levels of parathyroid hormone (PTH), insulin like growth factor-1 (IGF-1), interleukin-1 (IL-1), IL-6, IL-1β, tumor necrosis factor-alpha (TNF-α), IL-4, IFN-γ, vitamin D binding protein, TGF-β, OPG and RANKL</p>
<p>Methodology & Major Techniques to be used</p>	<p><u>Methodology:</u></p> <p>This case control study will enroll postmenopausal Saudi females (100 Osteoporosis patients and 100 age matched healthy controls). The study individuals will be part of Prince Mutaib chair of Biomarkers in Osteoporosis in Riyadh Project (RIYADH COHORT), coming from different Primary Health Care Centres (PHCCs). Anthropometrics and biochemical parameters will be measured for all participating subjects. PTH, IGF-1, IL1, IL6, IL-1β, TNFα, IFNγ, VDBP, TGFβ, RANKL and OPG will be measured in the serum of patients and age matched controls using well established ELISA based assays</p> <p><u>Major Techniques:</u></p> <p>(i) ELISA</p>

	(ii) Luminex
Availability of Samples	Yes
Availability of Chemicals	Yes
Availability of Instruments	Yes
Availability of Ethical Approval (if needed)	Yes
Recent References	<p>1-Ralston S, and Uitterlinden A. Genetics of Osteoporosis. Endo Reviews 31.(2010). 629–662.</p> <p>2-Naylor K, Eastell R (2012) Bone turnover markers: use in osteoporosis. Nature Reviews Rheumatology 8: 379–389.</p>