

عنوان المشروع باللغة العربية  
- Title of the  
proposed project in  
Arabic

تعيين العلاقة بين مستوي العناصر السامة و فيتامين د في السعوديين البالغين

Title of the proposed  
project in English

Association of toxic elements with serum 25(OH)D and 1,25(OH)2D among Saudi adults

المشرف الرئيس - PI

Prof. Nasser Al-Daghri

التخصص الدقيق للمشرف  
الرئيس - Specialty of  
PI

Clinical Biochemistry

المشرف المساعد - Co-PI

Dr. Sobhy Yakout

المدة المتوقعة لإنجاز البحث  
منذ الحصول على موافقة  
عمادة الدراسات العليا  
(بالشهور) - Expected  
time in month to  
finish

12 months

Abstract of the  
proposal (No more  
than 200 words)

Limited data suggest that toxic elements like lead (Pb), cadmium (Cd), and uranium (U) may disrupt vitamin D metabolism and inhibit production of 1,25(OH)2D, the active vitamin D metabolite, from 25-hydroxyvitamin D [25(OH)D] in the kidney. We will evaluate the association between blood lead (BPb) and urine arsenic (As), Cd, molybdenum (Mo), thallium (Tl), and U with markers of vitamin D metabolism [25(OH)D and 1,25(OH)2D].

Hypothesis of the  
proposal

A limited number of studies suggest that exposure to toxic metals may influence vitamin D status. Higher blood lead (BPb) concentrations in children were associated with higher levels of 25(OH)D in one study [1] and with lower levels of 1,25(OH)2D in a different study, leading to the hypothesis that Pb could inhibit the production of 1,25(OH)2D in the kidney [2]. Cadmium (Cd) exposure has also been associated with lower 1,25(OH)2D concentrations [3] but similar 25(OH)D concentrations, compared with levels in unexposed individuals [3]. In addition, experimental studies in rats have shown that uranium (U) exposure decreased 1,25(OH)2D concentrations [4] with no change in 25(OH)D concentrations [4].

The aim of this study is to determine the association of

<b>Specific objectives</b>	biomarkers of exposure to arsenic (As) and metals with 25(OH)D and 1,25(OH) <sub>2</sub> D concentrations in Saudi adults
<b>Methodology &amp; Major Techniques to be used</b>	Atomic absorption spectroscopy, UV spectrophotometer, cobase E 411
<b>Availability of Samples</b>	Yes
<b>Availability of Chemicals</b>	Yes
<b>Availability of Instruments</b>	Yes
<b>Ethical Approval</b>	Ethical approval is available
<b>Recent References</b>	<p>[1] Kemp FW, Neti PV, Howell RW, Wenger P, Louria DB and Bogden JD. Elevated blood lead concentrations and vitamin D deficiency in winter and summer in young urban children. <i>Environ Health Perspect</i> 2007; 115: 630-635. [2] Rosen JF, Chesney RW, Hamstra A, DeLuca HF and Mahaffey KR. Reduction in 1,25-dihydroxyvitamin D in children with increased lead absorption. <i>N Engl J Med</i> 1980; 302: 1128-1131. [3] Nogawa K, Tsuritani I, Kido T, Honda R, Ishizaki M and Yamada Y. Serum vitamin D metabolites in cadmium-exposed persons with renal damage. <i>Int Arch Occup Environ Health</i> 1990; 62: 189-193. [4] Tissandie E, Gueguen Y, Lobaccaro JM, Grandcolas L, Voisin P, Aigueperse J, Gourmelon P and Souidi M. In vivo effects of chronic contamination with depleted uranium on vitamin D<sub>3</sub> metabolism in rat. <i>Biochim Biophys Acta</i> 2007; 1770: 266-272. [5] Zamoiski RD, Guallar E, Garcia-Vargas GG, Rothenberg SJ, Resnick C, Andrade MR, Steuerwald AJ, Parsons PJ, Weaver VM, Navas-Acien A and Silbergeld EK. Association of arsenic and metals with concentrations of 25-hydroxyvitamin D and 1,25-dihydroxyvitamin D among adolescents in Torreon, Mexico. <i>Environ Health Perspect</i> 2014; 122: 1233-1238.</p>