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Title: Vitamin D and airway obstruction in an urban Irish asthmatic population

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Body: Background: Ireland has a high prevalence of vitamin D deficiency, but the link, if any, between serum vitamin D levels and airway obstruction in asthma remains unclear. Methods: Between November 2011 and March 2012, 99 consecutive adult subjects with asthma (aged 18 – 80 years) underwent blood draw and lung function testing. Serum samples were analyzed for measures of total serum vitamin D, total calcium, serum albumin, total IgE, and eosinophil cationic protein. Results: Vitamin D deficiency, defined as 25(OH)D below 50nmol/L, was present in 73% (mean vitamin D level was 39nmol/L). 25(OH)D levels were significantly lower in subjects with a low FEV1 /FVC ($r = 0.26$, $p < 0.01$). The combination of airway obstruction (FEV1 /FVC less than 0.7) and a serum 25(OH)D level less than 50 nmol/L was significantly more likely in non-atopic asthmatics (OR = 4, 1.08 – 15.35, $p < 0.05$) and in male asthmatics (OR = 5.5, $p < 0.05$) rather than female asthmatics (OR = 2.1, $p = 0.47$). The combination of airway obstruction (FEV1 /FVC less than 0.7) and a serum 25(OH)D level less than 50 nmol/L was also significantly more likely in males who had never smoked (OR = 6.1, 1.1 – 34.64, $p < 0.05$). Conclusions: In Irish adult asthmatic subjects, a low serum 25(OH)D level associated with airway obstruction is seen more often in non-atopic subjects and in men who have never smoked. It remains uncertain whether low serum 25(OH)D contributes to, or is a consequence of, airway obstruction in asthma.