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Title: The in vitro effect of vitamin D on peripheral blood mononuclear cell cytokine expression in COPD

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Body: Background Vitamin D is recognised as a powerful modulator of immune responses. It promotes T helper 2 (Th2) immunity and the anti-inflammatory cytokine Interleukin-10 (IL-10). However, little is known about the effects of vitamin D on the immune response in COPD, a Th1 mediated disease. Aims and objectives We hypothesised that in COPD vitamin D would push a Th2 response, with increased levels of the Th2 cytokine Interleukin-4 (IL-4) and the suppressive cytokine IL-10. Such a shift could be beneficial in COPD. Methods We recruited 10 COPD subjects from whom we isolated peripheral blood mononuclear cells (PBMC) and measured serum 25(OH)D. PBMC were stimulated with antibodies to the T cell receptor either with or without added vitamin D. Results For both IL-4 and IL-10, we observed a biphasic effect of vitamin D supplementation. For those with low (<30nmol/L) and high (>80nmol/L) serum 25(OH)D, added vitamin D suppressed IL-4 and IL-10 (Figure 1,2). Between these two levels, vitamin D increased expression. Conclusions Serum 25(OH)D levels may be an important determinant of the usefulness of vitamin D in beneficially modifying the immune response in COPD.