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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.