The effects of vitamin A supplementation with measles vaccine on leucocyte counts and in vitro cytokine production - DTU Orbit (08/11/2017)

The effects of vitamin A supplementation with measles vaccine on leucocyte counts and in vitro cytokine production

As WHO recommends vitamin A supplementation (VAS) at vaccination contacts after age 6 months, many children receive VAS together with measles vaccine (MV). We aimed to investigate the immunological effect of VAS given with MV. Within a randomised placebo-controlled trial investigating the effect on overall mortality of providing VAS with vaccines in Guinea-Bissau, we conducted an immunological sub-study of VAS v. placebo with MV, analysing leucocyte counts, whole blood in vitro cytokine production, vitamin A status and concentration of C-reactive protein (CRP). VAS compared with placebo was associated with an increased frequency of CRP≥5 mg/l (28 v. 12 %; P=0·005). Six weeks after supplementation, VAS had significant sex-differential effects on leucocyte, lymphocyte, monocyte and basophil cell counts, decreasing them in males but increasing them in females. Mainly in females, the effect of VAS on cytokine responses differed by previous VAS: in previous VAS recipients, VAS increased the pro-inflammatory and T helper cell type 1 (Th1) cytokine responses, whereas VAS decreased these responses in previously unsupplemented children. In previous VAS recipients, VAS was associated with increased IFN-γ responses to phytohaemagglutinin in females (geometric mean ratio (GMR): 3·97; 95 % CI 1·44, 10·90) but not in males (GMR 0·44; 95 % CI 0·14, 1·42); the opposite was observed in previously unsupplemented children. Our results corroborate that VAS provided with MV has immunological effects, which may depend on sex and previous VAS. VAS may increase the number of leucocytes, but also repress both the innate and lymphocyte-derived cytokine responses in females, whereas this repression may be opposite if the females have previously received VAS.

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