Cholecalciferol supplementation, vitamin D status and T-cell immune phenotype in HIV-infected children: a randomised controlled trial

Vigano, A¹; Giacomet, V¹; Manfredini, V¹; Bedogni, G²; Mora, S³; Cerini, C¹; Borelli, M⁴; Trabattoni, D⁴ and Zuccotti, G¹

¹Luigi Sacco Hospital, Pediatric Clinic, University of Milan, Milan, Italy. ²Liver Research Center, Clinical Epidemiology Unit, Basovizza, Trieste, Italy. ³San Raffaele Scientific Institute, Laboratory of Paediatric Endocrinology and BoNetwo, Milan, Italy. ⁴University of Milan, Department of Immunology, Milan, Italy.

Purpose of the study
Besides its known effects on bone metabolism, vitamin D may regulate immune function. We performed a randomized controlled trial (RCT) to test whether cholecalciferol supplementation can improve vitamin D status and modulate immune responses in HIV-infected children and youth.

Methods
Caucasian vertically HIV-infected patients (aged 8 to 26 years) with vitamin D deficiency and normal parathormone (PTH) levels were randomized into an experimental (n=25) and control (n=25) group to receive 100,000 IU of oral cholecalciferol every 3 months for a total of 4 doses, or placebo. A pre-randomization period (3 months) was also taken into account to better model within-individual variability. Mixed linear regression models were used to evaluate the between-group changes in the outcomes of interest. The analysis was intention to treat.

Summary of results
47 subjects completed the RCT. Cholecalciferol supplementation produced an early decrease in PTH levels (3 months) and a later concomitant increase in 25(OH)D and 1,25(OH)2D levels (6 months), both persisting up to 12 months. The supplementation had no effect on CD4⁺T-cell numbers or percentage while was associated with a decreased loge Th1, an increased loge Th2 (*p<0.05), an increased loge Treg (**p<0.01), and a decreased loge Th17:Treg (*p<0.05).

Conclusions
In our cohort, supplementation with oral cholecalciferol was effective in increasing serum 25(OH)D and 1-25(OH)2D while decreasing serum PTH levels, had no effect on CD4⁺T-cell count, but was associated with T-cell phenotype changes mainly favoring Tregulatory subset.

Reference