Vitamin D supplementation in patients with primary immunodeficiency

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Background:
Vitamin D deficiency is common in pediatric population.
We aimed to check effectiveness of vitamin D supplementation in patients with primary immunodeficiency (PID).

Materials and methods:
In group of 103 patients (68 girls and 35 boys), with diagnosis of PID according to European Society for Immunodeficiency criteria, 25-hydroxyvitamin D (25OHD) was measured. All patients were divided into 7 age –related groups. Dose of vitamin D supplementation was known in 51 out of 103 individuals.

Results:
All patient presented suboptimal mean serum 25OHD (24,48 ng/ml). The results were highest in summer (28,09 ng/ml) and lower in other seasons: in autumn (23,66 ng/ml), in winter (23,6 ng/ml) and in spring (23,2 ng/ml). Only children under 3 years of age had optimal level of 25OHD (39,62 ng/ml). In older children 25OHD concentration was suboptimal. In no age group 25OHD deficiency was found (mean level: 22 ng/ml - 25,78 ng/ml).
Mean dose of vitamin D supplementation was 894 IU per day. The lowest dose was in children under 3 years of age (525 IU per day) and highest among teenagers aged 15 - 18 years (1533 IU per day).

Age [years]	Number of patients	Vitamin D supplementation dose per day [IU]	Mean 25(OH)D concentration [ng/ml]	Optimal 25(OH)D concentration (30-50 ng/ml)
0-3	5	525	39,62	5/5 [100%]
3-6	18	867	24,42	7/18 [39%]
6-9	21	745	23,34	3/21 [14%]
9-12	20	850	23,62	3/20 [15%]
12-15	18	963	22,0	5/18 [28%]
15-18	12	1533	24,45	4/12 [33%]
>18	9	No data	25,78	0/0 [0%]

Table 1. Vitamin D supplementation and 25(OH)D concentration by age

Season	Number of patients	Mean 25(OH)D concentration [ng/ml]
Spring	35	23,2
Summer	23	28,09
Autumn	26	23,66
Winter	19	23,6

Table 2. 25(OH)D concentration by seasons

Conclusions: Patients older than 3 years of age with primary immunodeficiency had not sufficient vitamin D supplementation.
Teenagers receiving vitamin D in higher doses than healthy children had no deficiency but suboptimal level of 25OHD. To achieve the optimal level of 25OHD the higher doses supplementation of vitamin D should be recommended.