Letters to the Editors

Serum 25-hydroxyvitamin D in juvenile idiopathic arthritis patients in Finland

Sirs,

Association between serum 25-hydroxyvitamin [S-25(OH)D] level and disease activity of rheumatoid arthritis has been shown in several (1-3) but not in all (4) studies. The putative relation of vitamin D and juvenile idiopathic arthritis (JIA) is poorly understood. In one study (5) no overall association between JIA activity and S-25(OH)D was seen, but in the subset of new-onset JIA patients an inverse although non-significant correlation was detected.

This study includes 136 Finnish JIA patients and investigates the association of S-25(OH)D and JIA. Samples were collected during 1997-2001 and stored in -70°C until analysis. There was no detailed information on the disease subtype according to American International League of Associations for Rheumatology (ILAR) classification (6), and JIA patients were thus categorised retrospectively based on their medical case records having either oligoarticular or polyarticular JIA at time of sample collection. The criteria for inactive disease included: no active arthritis, no fever, no rash and no active uveitis. S-25(OH)D concentrations were analysed with 25-OH Vitamin D EIA Kit (Immunodiagnostic Systems Ltd). Intra-assay and inter-assay CVs were 2.15% and 5.27%, respectively. The quality and accuracy of the S-25(OH)D analysis was confirmed by participation in the vitamin D External Quality Assessment Scheme (DEQAS). Multivariate modelling was performed using general linear model (GLM; SAS 9.2 version). Since there was interaction between sex and subtype of JIA, S-25(OH)D level modelling was carried out separately in males and females.

The results are presented in Table I. There was no significant difference in S-25(OH)D concentrations between patients with polyarticular and oligoarticular JIA. After adjustment for possible confounding factors, polyarticular JIA was associated with lower S-25(OH)D levels in female patients (p=0.02). Patients with active JIA had higher S-25(OH)D concentrations than patients with inactive JIA (p=0.03). The result remained statistically significant in male patients after adjustment for possible confounding factors (p=0.008).

Our results suggest that JIA subtype may be associated with S-25(OH)D levels in female patients. There is evidence of an interaction between female sex-hormones and vitamin D metabolism (7) suggesting a possible gender-specific action of vitamin D, but this needs to be investigated in more detail in the future. Unexpectedly male patients with active disease had higher S-25(OH)D levels than those with inactive disease. Glucocorticoid use associates with lower S-25(OH)D levels (7), and thus the fact that a part of the patients were receiving glucocorticoids complicates the interpretation of the results. Patients receiving glucocorticoids had, however, slightly higher S-25(OH)D concentrations (64.6 nmol/l vs. 62.9 nmol/l), possibly indicating that vitamin D supplementation was recommended for these patients. Since almost all patients receiving glucocorticoids had active disease, this may partly explain the finding of higher S-25(OH)D concentrations in male patients with active disease. This cannot be confirmed in the present study though, since information on vitamin D supplementation and dietary intake of vitamin D was not available, and the information on the medication incomplete. There is a concern of potential degradation of S-25(OH)D during storage (9-13 years). Previously we have evaluated the degradation of S-25(OH)D during storage in a larger sample set (n ~1100) by comparing samples that had been stored for 10-13 and 14-17 years, and found no difference in the mean S-25(OH)D concentrations (unpublished observation). The seasonal difference in S-25(OH)D concentrations was not statistically significant in the male patients. Considering the variation in S-25(OH)D concentrations between individuals, lack of significant seasonal variation may at least partly be due to a small number of male patients in the present study. In the future the possible relationship of vitamin D with JIA should primarily be investigated in a larger sample set of preferably new-onset JIA patients, with more thorough information of the vitamin D intake and disease activity.

Table I. Univariate analysis of S-25(OH)D levels in Finnish JIA patients.

	n.	Mean S-25(OH) D (nmol/l)	SD	*p*-value	*p*-value (adjusted*)	*p*-value male (adjusted*)	*p*-value female (adjusted*)
JIA subtype							
Polyarticular JIA	62	61.2	18.0	0.33	0.37	0.51	0.02
Oligoarticular JIA	74	64.4	19.9				
Activity of JIA							
Active JIA	101	65.0	19.4	0.03	0.04	0.008	0.50
Inactive JIA	35	57.0	16.9				
Season of sample collection							
Summer (Jul, Aug, Sep)	40	73.0	19.0	< 0.001	< 0.001	0.18	0.001
Autumn (Oct, Nov, Dec)	41	62.8	15.2				
Winter (Jan, Feb, Mar)	25	51.0	18.8				
Spring (Apr, May, Jun)	30	59.5	17.9				
Age							
1-6 years	30	66.5	22.4	0.38	0.20	0.18	0.54
7-12 years	50	63.4	15.5				
13-18 years	56	60.6	20.1				
Gender							
Male	44	63.9	18.2	0.69	0.33	–	–
Female	92	62.5	19.6				

*adjusted for JIA subtype, JIA activity, gender, age of sample collection, year of sample collection and season of sample collection.

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