

Vitamin D levels and not vitamin A are correlated with height velocity in children with growth hormone(GH) deficiency who are under GH treatment

Maria Xatzipsalti, Polychroni Ioulia, Vasiliki-Ioanna Mitravela, Eirini Papadimitriou, Andriani Vazeou, Lela Stamogiannou

A' Department of Pediatrics, P&A Kyriakou Children's Hospital Athens, Greece

BACKGROUND

Nutritional status modulates growth during childhood, in part by altering Growth Hormone (GH) secretion and modifying the IGF-I levels. Little is known about the exact role of micronutrients, and especially vitamins, in modulating these factors.

VitA is required for normal growth and development(1). Short children with GH neurosecretory dysfunction (reduced spontaneous night-time GH pulsatility) are more likely to have lower dietary Vit A intake than normal-stature children, and a correlation between nocturnal GH secretion and fasting plasma VA level exists in short and normal children(2).

Animal studies have shown that rats fed a low-VA diet have significant reduction in body weight(3,4), but no well-controlled data on longitudinal growth have been reported.

OBJECTIVES -METHODS

We aimed to evaluate VitA levels in GH deficient children under GH replacement (GHR).

- Vitamin A levels were measured in 38 children [23 males, mean age 10.8 (SD 3.3) years] with GHD, after mean duration of GH treatment of 3.1 (SD 2.6) years.
- Height, weight, BMI, height SDS, height velocity SD were evaluated at the time of vitamin A measurement (time1) and one year before(time 0). Patient characteristics are shown in table.
- Vitamin D and PTH levels were also measured at the same time.
- Statistical analysis: linear regression, x2, student's t-test

	Mean (SD)
Chronological age	10.8 (3.3)
Height(0) cm	130.6 (16.9)
Height (0)sds	-0.99(1.47)
BMI(0) kg /m ²	18.81(2.71)
BMI(0)sds	-0.21(1.1)
Height (1)cm	137.05(17,5)
Height (1)sds	-0.8 (1.2)
BMI(1) kg /m ²	16.87 (4.2)
BMI(2)sds	-0.17 (1.13)
Height velocity cm/year	9.51(11.4)
Height velocity sds	2.07(3.59)

Table. Patient characteristics

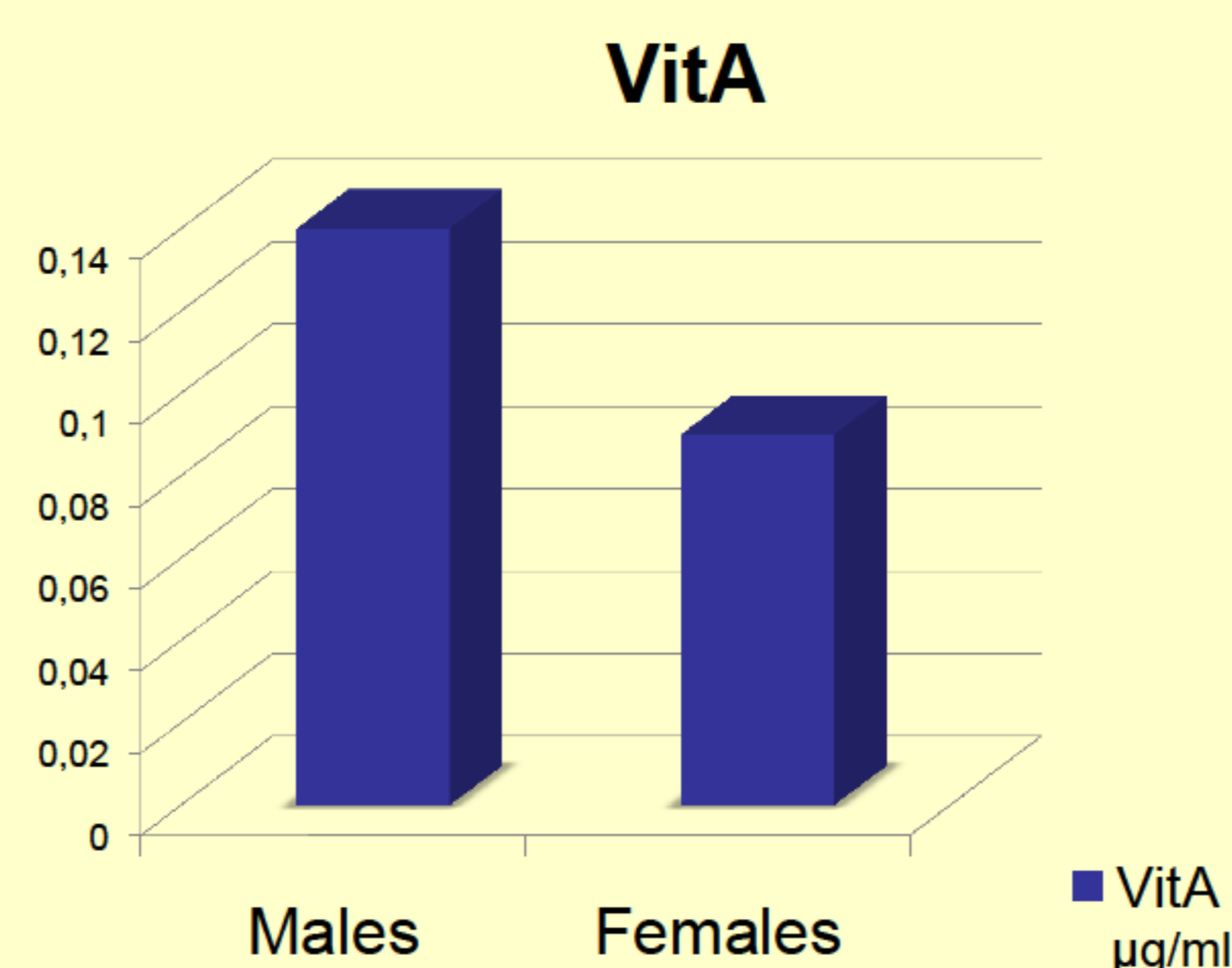


Fig1. VitA in males and females

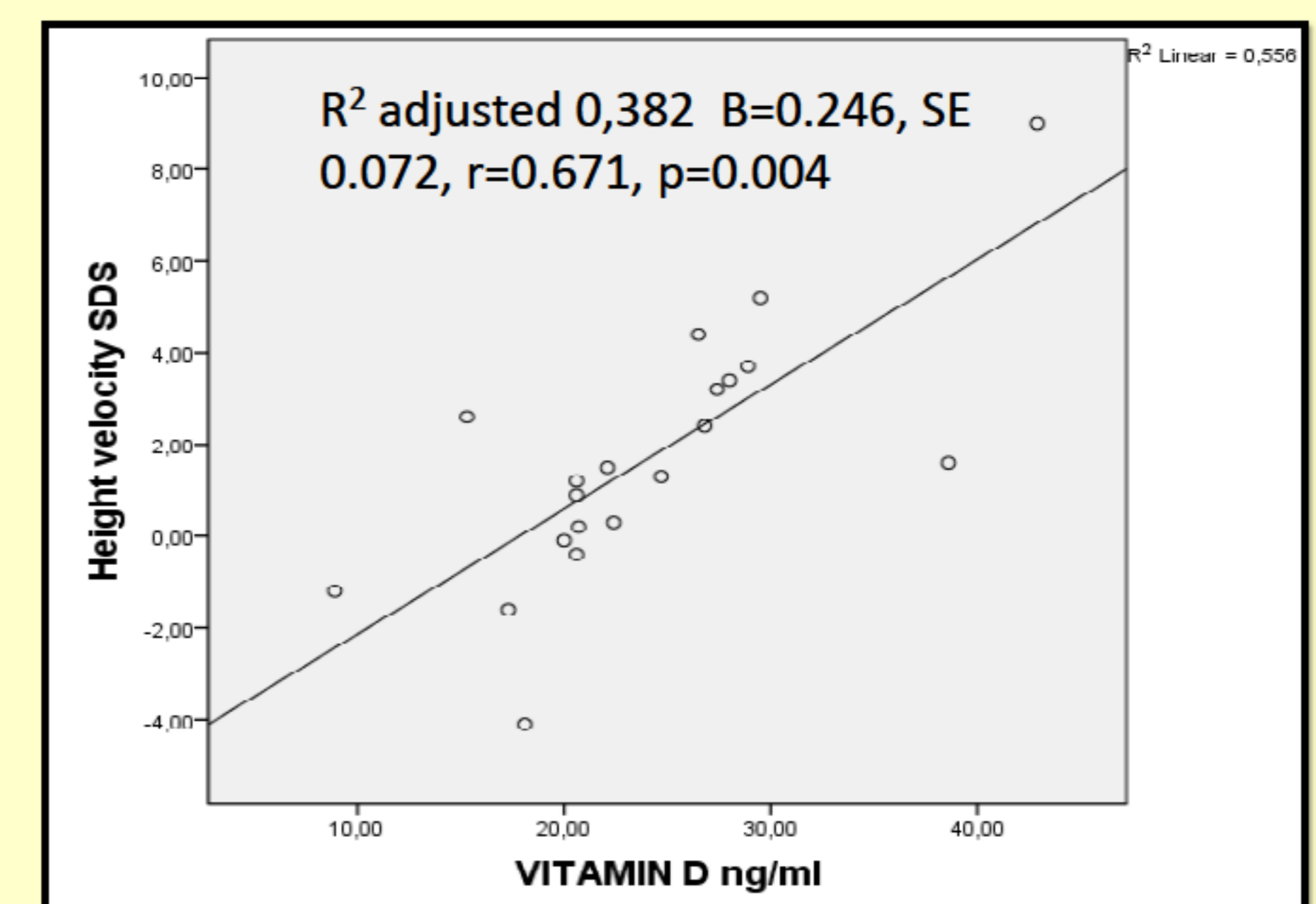


Fig2. Height velocity SDS had a positive correlation with vitamin D levels

RESULTS

➤Linear Regression analysis showed that height velocity and height velocity SDS were not correlated with vitamin A levels. Furthermore no difference could be detected in height velocity SDS between children with low (11 subjects) or children with normal vitamin A levels (25 subjects).

➤Males had significantly higher levels of vitamin A compared with females (mean SD) 0.43 (0.14) vs 0.33 (0.09) µg/ml respectively (p=0.014) (Fig1)

➤Height velocity SDS had a positive correlation with vitamin D levels (R2 adjusted 0,382 B=0.246, SE 0.072, r=0.671, p=0.004). (Fig2)

CONCLUSIONS

We found that Vitamin D levels and not vitamin A are correlated with height velocity in children with growth hormone deficiency who are under GH treatment.

References

1. Vitamin A deficiency: a global disease. *Nutr Rev* 1985;43:240
2. Raifen R, Altman Y, Zadik Z. Vitamin A levels and growth hormone axis. *Horm Res* 1996;46:279-81
3. Mallo F, Lamas JA, Casanueva FF, Dieguez C. Effect of retinoic acid deficiency on in vivo and in vitro GH responses to GHRH in male rats. *Neuroendocrinology* 1992;55:642-7.
4. Breen JJ, Matsuura T, Ross AC, Gurr JA. Regulation of thyroidstimulating hormone -subunit and growth hormone messenger ribonucleic acid levels in the rat: effect of vitamin A status. *Endocrinology* 1995;136:543-9.

