



Cranial MR Spectrometry Findings of Patients Aged 0-15 years with Diagnosis of Rickets

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Objective

It is known that vitamin D has differential roles in cell proliferation, differentiation, neurotransmission and neuroplasticity in nervous system and exerts neurotrophic and neuroprotective effects, even different functions of vitamin D has been studied by advocating that vitamin D should be classified as a neurosteroid. It has been long known that vitamin D deficiency, VDR dysfunction, hyperparathyroidism and hypervitaminosis are potential causes for sensorineural hearing loss. Here, we aimed to detect pretreatment cranial spectrometry findings in patients with rickets.

Material-method-Results

Material-methods

This study included pretreatment cranial MR spectrometry evaluations of 30 patients (aged 0-15 years) who were diagnosed as rickets in Child Endocrinology department of Yüzüncü Yıl University, Prof.Dr.Dursun Odabaş Medical Center between January, 2014 and July, 2014.

Results

The study included 31 patients diagnosed as rickets. One patient was excluded due to declining participation. All patients underwent cranial MR spectrometry. Mean age was 2.15 ± 4.12 years (min-max: 0.07-15.13) in 30 patients with rickets. There were 8 girls (25.8%) and 23 boys (74.2%). When biochemical and hormone values were studied in patients with rickets, the following results were observed: mean calcium value, 8.09 ± 1.52 mg/dL; mean phosphor value, 4.24 ± 1.53 mg/dL; mean magnesium value 1.95 ± 0.23 mg/dl; mean alkaline phosphatase value 838.23 ± 627.86 U/L; mean parathormone value, 314.82 ± 310.76 pg/mL; mean creatinine kinase value, 173.58 ± 239.73 U/L; mean albumin value 4.05 ± 1.41 g/dL; and mean 25 OH vitamin D level 5.52 ± 3.20 ng/mL. The following values were found in cranial MR spectrometry: mean choline, 105.14 (min-max: 5.99-173); mean creatinine, 84.08 (min-max: 2.96-126); N-acetyl aspartate, 127.69 (min-max: 0.01-max: 206); mean choline/creatinine, 1.4 (min-max: 0.74-3.2) and N-acetyl aspartate/creatinine, 1.61 (min-max: 4.04). When cranial spectrometry and biochemical values were assessed by Pearson correlation, a positive correlation was detected between vitamin D level and N-acetyl aspartate/creatinine ratio. It was found that there was negative correlation between calcium level and creatinine value while positive correlation between calcium level and choline/creatinine ratio.

Table 1. The correlation analysis between vitamin D and MR spectroscopi findings

		Choline	Creatine	N-acetyl aspartate	Choline/Creatine	N-acetyl aspartate/Creatine
Vitamin D	Pearson Correlation	-0,245	-0,316	-0,173	0,216	0,420
Calcium	Pearson Correlation	-0,239	-0,541	-0,298	0,449	0,312
Phosphor	Pearson Correlation	-0,175	-0,273	-0,157	0,254	0,196
Magnesium	Pearson Correlation	-0,391	-0,416	-0,382	0,255	0,025
Alkaline phosphatase	Pearson Correlation	0,391	0,344	0,275	-0,115	-0,119
Parathormone	Pearson Correlation	0,463	0,303	0,402	-0,043	0,001

Conclusion

Although this study is conducted on a limited sample size, we think that cranial MR spectrometry findings will provide useful data in monitoring patients with vitamin D deficiency and in studies investigating effects of vitamin D deficiency on brain.

References

1. Allgrove J. A practical approach to rickets. In: Allgrove J, Shaw NJ (eds). Calcium and Bone Disorders in Children and Adolescents, Endocr Dev. Basel, Karger, 2009; 16:115-132

