P3-664

UNIKLINIK KÖLN

Klinik und Poliklinik für Kinder- und Jugendmedizin

Short stature in Osteogenesis Imperfecta is not associated with deficiencies in IGF1 or IGF-BP3

Semler O, Hoyer-Kuhn H, Allo G, Schoenau E,
Children´s Hospital, University of Cologne, Cologne, Germany

Conclusions

- Severe OI is associated with short stature (significant height reduction in OI type 3 vs. OI type 4)
- The type of OI does not influence IGF-1 and IGF-BP3 in a significant way
- Most children below 5 years present with a decreased IGF-1 / IGF-BP3 ratio

Background

Osteogenesis imperfecta is a rare collagen related hereditary disease leading to recurrent fractures, reduced mobility, muscular weakness and short stature. It was always discussed if the reduced height is a consequence of the impaired collagen production, a physiological reaction of the body to the brittleness of bones (longer bones fracture more easily than short bones of the same diameter) or if the patient might suffer from an additional deficiency of growth hormone (GH).

Primary objective of the study: Evaluation of IGF 1 and IGF-BP3 levels in patients with moderate or severe types of Osteogenesis imperfecta.

Patients and Methods

In a retrospective analysis 60 children (28 male; OI type 3 n=22, OI type 4 n=38) were investigated during their regular yearly examinations and stratified according to the clinical severity of the disease. The patient characteristics are displayed in table 1.

IGF-1 levels were measured with LIAISON®-Immunoassay-Analyzer (Company: DiaSorin) and IGF-BP3 levels with Immulite 2000 (Company Siemens Medical Solutions Diagnostics. Gender and age matched reference ranges were provided by the central lab and converted to z-scores.

	Total Cohort	OI type 3	OI type 4	p - level (OI type 3 vs. type 4)
Number of patients	60	22	38	-
Male / Female n [%]	38 / 22 [63.3 / 36.7]	14 / 8 [63.6 / 36.4]	24 / 14 [63.2 / 36.8]	-
Age (years) Mean [SD]	7.58 [4.70]	6.37 [4.30]	8.40 [4.72]	0.0955
Height (cm) Mean [SD]	99.30 [21.56]	83.98 [16.41]	108.2 [19.18]	<0.0001
Height z-score Mean [SD]	-4.76 [3.13]	-6.57 [3.15]	-3.71 [2.63]	0.0011
Weight (kg) Mean [SD]	19.39 [11.38]	13.60 [7.98]	22.73 [11.79]	0.0001
Weight z-score Mean [SD]	-2.02 [1.71]	-3.17 [1.13]	-1.36 [1.65]	<0.0001
BMI (kg/m²) Mean [SD]	18.21 [4.53]	18.05 [4.40]	18.30 [4.66]	0.9363
BMI z-score Mean [SD]	0.85 [1.96]	1.04 [1.99]	0.74 [1.96]	0.3663

Table 1: Patients characteristics stratified for severity of the diseases.

Results I

- In the mean the levels for IGF-1 and IGF-BP3 are in the lower normal range.
- There was no significant difference in the measured growth parameter regarding severity of the disease despite a significant difference in height of the patients.

	OI III	OI IV	p
Number of patients	22	38	
IGF1 z-score Median [IQR]	-1.45 [-2.376 / -0.913]	-0.95 [-1.574 / -0.883]	0.2881
IGFBP3 z-score Median [IQR]	-0.13 [-0.742 / 0.226]	0.05 [-0.321 / 0.152]	0.6717

Table 2: Levels of IGF-1 and IGF-BP3

Results II

- Patients younger 5 years of age present with reduced IGF1 levels and normal IGF-BP3 levels.
- 2 Patients with reduced IGF-1 and IGF-BP3 levels were tested for GHD and showed a normal response to an Arginin provocation test.

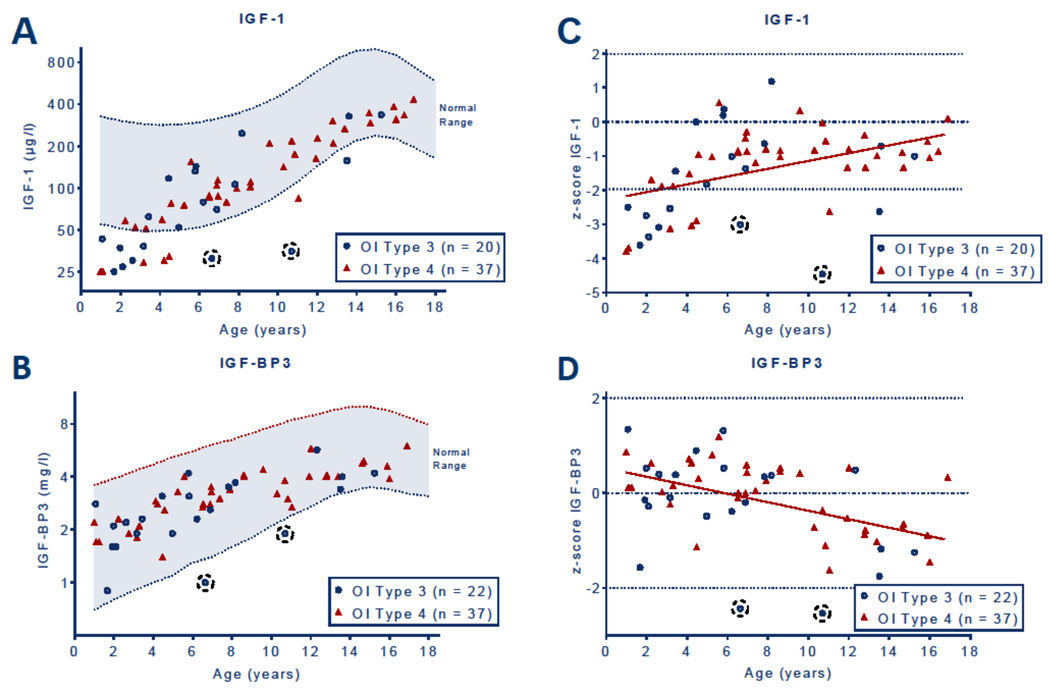

Fig. 1: Presentation of growth factor levels plotted against age for children (1 A/B show absolute individual levels; 1 C/D age related z-scores) with OI type 3 marked by the circles and OI type 4 by the triangles.

Discussion

- Despite a severely reduced height IGF1 and IGF-BP3 are in the normal range for children older 5 years of age.
- Reduced IGF-1 levels in young children might be influenced by a reduced muscle mass due to impaired mobility or due to nutritional deficits.
- Diseases specific reference curves would help to identify patients with an impaired growth who should be tested for a GHD.

Further information: joerg.semler@uk-koeln.de
Supported by OI-Society Baden-Württemberg (Germany)

ESPE 2015 664--P3
Bone
Oliver Semler
DOI: 10.3252/pso.eu.54espe.2015
Poster presented at: 54th Annual Meeting 1-3 October ESPE 2015 BARCELONA European Society for Paediatric Endocrinology