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Results of mecasermin treatment in pediatric patients evaluated for severe and partial primary deficiency of IGF-1

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Background

Severe primary deficiency of insulin-like growth factor-1 (IGFD) being characterized by growth failure and short stature in children, constitutes an indication to recombinant human IGF-1 (mecasermin) treatment. It is defined by serum insulin-like-growth factor-1 (IGF-1) levels less than or equal to 2.5 th percentile, height less than or equal to -3SDS, normal growth hormone (GH) secretion and exlusion of secondary causes of IGFD.

Objective

Our objective was to present results and possible side effects of mecasermin treatment in pediatric patients evaluated for severe and partial primary deficiency of IGF-1 at a pediatric endocrinology unit in Poland.

Methods

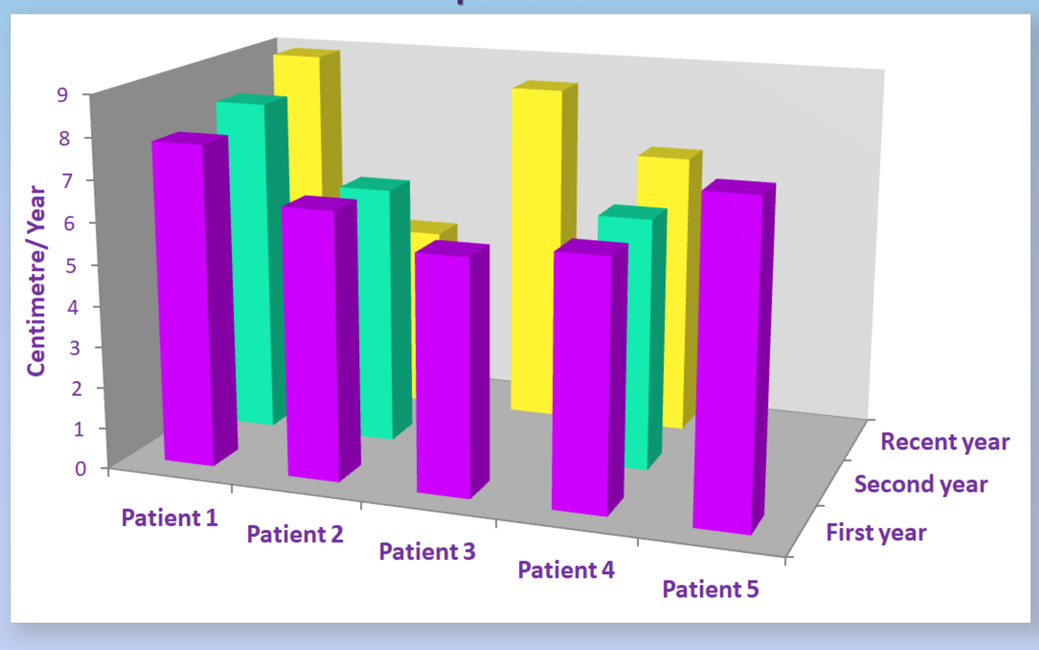
We present 5 patients (4 male and 1 female) (aged: 7 to 16 years) treated in our unit with mecasermin between 2010 and 2018. The patients were qualified for replacement therapy by performing physical examination with stature measurement and running laboratory and radiological tests according to the protocol. The presence of IGFD was confirmed by IGF-1 generation test. We performed genetic tests involving IGF-1 – GH pathway in William Harvey Research Institute, Barts and the London School of Medicine. Initial doses of mecasermine 0.04 mg/kg to the maximum dose of 0.12 mg/kg twice daily were given .

Results

Table 1. Height velocity in patients during treatment with mecasermine (cm/year)

	Delta (ng/ml)	First year of treatment	Second year of treatment	Recent year of treatment
Patient 1	71	7.8	8.2	8.9
Patient 2	11	6.5	6.3	4.5
Patient 3	66	5.7	-	8.4
Patient 4	16	6.0	6.1	6.9
Patient 5	12.8	7.6	-	-

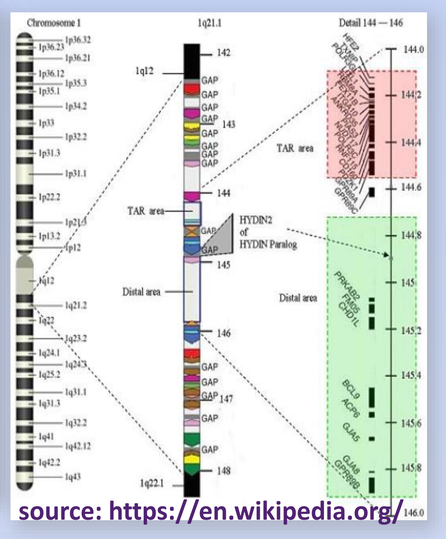
Figure 1. Graphic illustration showing height velocity in treated patients



1q21.1 microdeletion

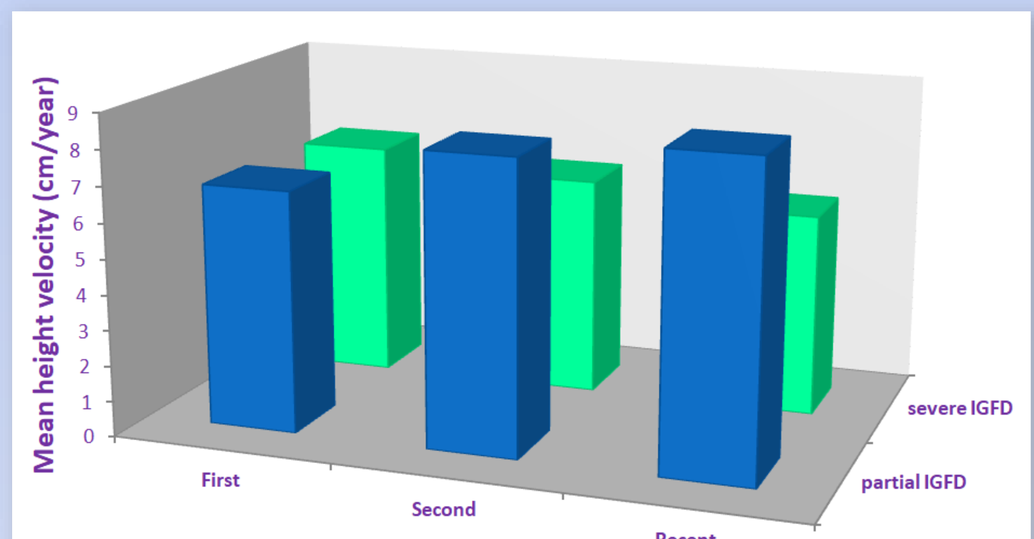
**Two of our patients: Patient 2 and Patient 4 consent to be tested by William Harvey Research Institute, Barts and the London School of Medicine in order to search for possible 1q21.1 microdelation. Many studies report that 1q21.1 deletions are associated with a wide range of abnormalities in pediatric population. This type of chromosomal aberration is marked by i.a. delayed development, short stature, intellectual disabilities, dysmorphic facial features,
skeletal anomalies, congenital heart diseases, neurological problems or may be not associated with any of features listed above.**

Figure 3. The structure of 1q21.1



source: https://en.wikipedia.org/

Figure 2. Mean height velocity in patients with partial IGFD comparing to patients with severe IGFD



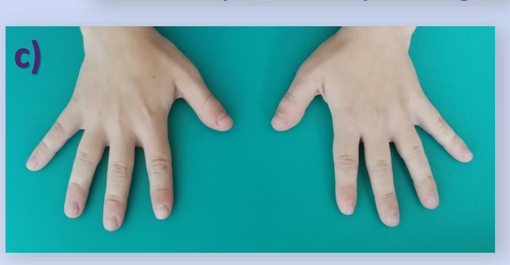


Figure 4. a,b,c Patient 2

- **Duration of treatment totalled 8 years in Patient 1, 6 years in Patient 2, 2 years in Patient 3, 3 years in Patient 4 and 1 year in Patient 5.**
- **After one year of treatment, therapy with mecasermin was discontinued in Patient 3, because of Fanconi anaemia suspicion. Therapy began once again following the diagnosis exclusion.**
- **We observed only one complication in the form of hypoglycemia in Patient 4.**

Conclusion

Therapy with mecasermin in case of partial IGFD provides comparable satisfactory results to severe IGFD treatment.

References

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