Clinical characteristics and response to growth hormone treatment in patients with Prader-Willi Syndrome

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Introduction and aim

Prader-Willi syndrome (PWS), is a genetic disorder caused by the absence of paternal genes located on chromosome 15q11.2-q13(1). In this multi-central study; patients with PWS were followed for 2 years. Initial clinical and laboratory findings, growth hormone treatments and their responses were evaluated.

Patients and methods

54 patients from 10 pediatric endocrine centers were involved and data was evaluated retrospectively from the national data system. Complaints at admission, initial and follow up anthropometric measurements, thyroid and gonadal functions were noted. Clinical and laboratory findings of the patients who had growth hormone treatment and their responses were recorded.

Results

Table 1: Clinical and demographic characteristics of patients

	Patients (n=54)
Mean age at admission (year)	2.7±3.2
Gender, male, n (%)	27 (50)
Pubertal status, prepubertal, n(%)	52 (96.3)
Mean height SDS	-1.20±1.25
Mean weight SDS	0.4±2.26
Mean BMI SDS	1.08±2.58

Table 2: Complaints of patients at admission

	n (%)
Hypotonia	30 (55.6)
Feeding problems	20 (37)
Obesity	17 (31.5)
Developmental delay	14 (25.9)
Atypical face	7(13)
Short stature	6 (11.1)
Mental retardation	5 (9.3)
Cachexia	4 (7.4)
Sleep Problems	4 (7.4)
Small hands and feet	3 (5.6)
Undescended testicle*	18 (66.6)*
Micropenis*	4 (14.8)*

* % of males

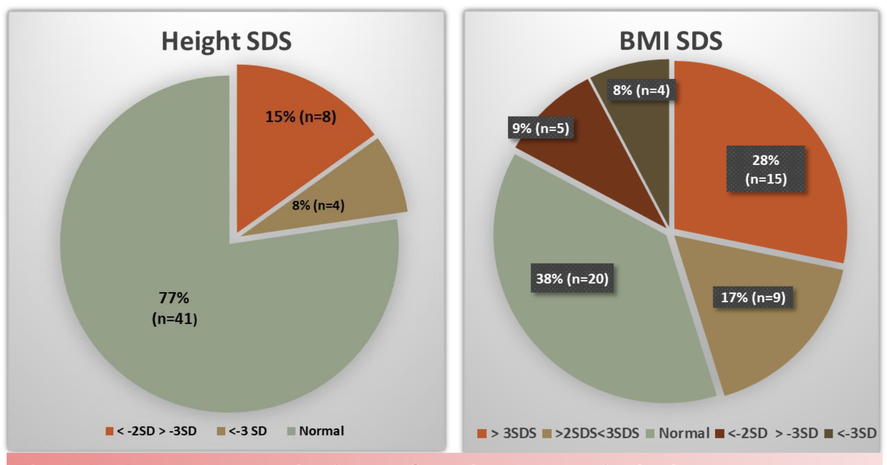

Fig 1-2: Antropometric data of patients at admission

Age was positively correlated with BMI SDS **(r= 0,84, p<0,001).** With increasing age obesity as a complaint at admission increased **(p<0,019).** With decreasing age poor nutrition as an initial complaint increased **(p<0,035)**

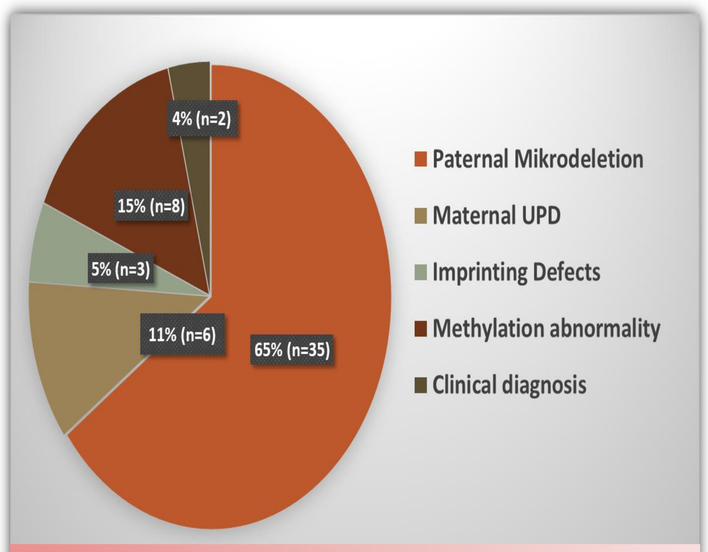

Fig 3. Genetic analysis of patients

Table 3: Endocrinologic problems of patients

	n (%)
Central Hypothyroidism	15 (28.3)
Primary Hypothyroidism	6 (11.3)
Central Adrenal Insufficiency	2 (3.8)
Hypogonadotropic Hypogonadism	2 (3.8)
Hypergonadotropic Hypogonadism	1 (1.7)

❖ Behavioral characteristics were evaluated in 34 patients; 70.5% (n=24) had behavioral problems.
❖ The most frequent behavioral problem was **learning disability** [55.8% (n=19)].
❖ **Scoliosis** was the most observed skeleton problem [%22.2 (n=12)].
❖ **Obstructive sleep apnea** was reported in 42.6% (n=23).

Growth hormone treatment was started in 46.2% (n=22) at the mean age of 4.72±2.7 years and with a mean dose of 0.025 ± 0.005 mg/day.

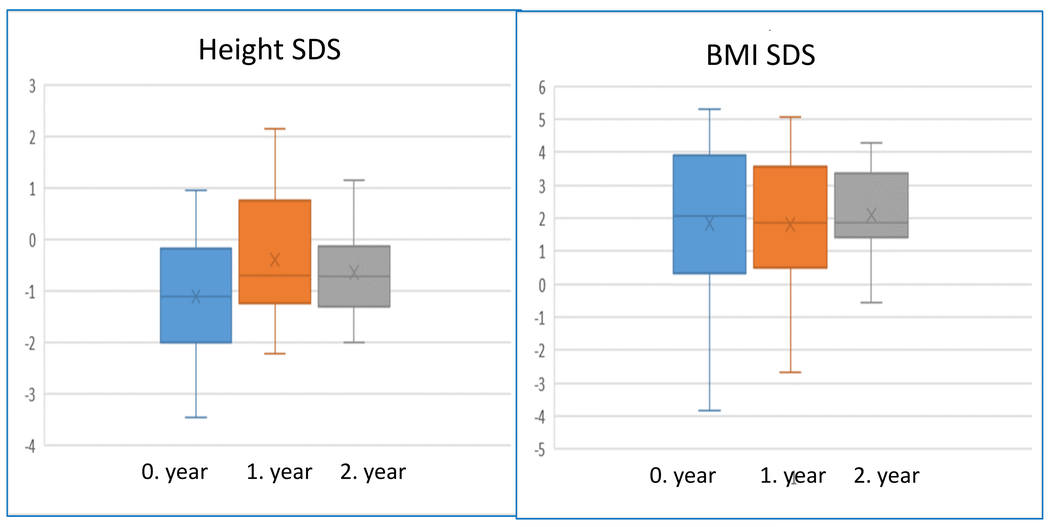

Fig 4-5: Height and BMI SDS changes in patients treated with GH according to years

1.year GV (n=21)= 9.9± 2.5 cm/year

2. year GV (n=11)= 8.1± 3.1 cm/year

Table 4: Clinical and biochemical evaluations of the patients : before and after 1 year of GH treatment

		Initial	1. year	p
Height SDS	(n=21)	-1.4 (-2.0; -0.6)	-0.9 (- 1.3; -0.4)	<0.001
Weight SDS	(n=21)	0.3 (-0.8 ; 2.5)	1.2 (-0.2; 2.6)	0.035
BMI SDS	(n=21)	1.8 (0.6 ; 3.2)	2.0 (1 ; 3.3)	>0.05
Glucose (mg/dl)	(n=18)	81,5 (67.7; 86.2)	85.5 (76.2; 91)	>0.05
HbA1C	(n=7)	5.2± 0.1	5.4±0.2	>0.05
Insulin	(n=15)	7.6 (5.2; 9.6)	10 (8.1 ; 12.4)	0.047
IGF-1 SDS	(n=17)	-2.5 (-2.7; -2)	-0.6 (-1.0; 0.8)	<0.001

Conclusion

Clinical findings differ according to age. Feeding difficulties are observed in younger patients, obesity is observed in older children. Growth hormone treatment although increased height SDS it didn't effect BMI in one year. Longer growth hormone treatment durations are needed to draw definite conclusions.

References: 1.Holm VA,Cassidy SB,Butler MG, et al. Prader-Willi syndrome: consensus diagnostic criteria. *Pediatrics* 1993;**91**:398–402