

# EVALUATION OF SERUM MYOSTATIN LEVELS IN PATIENTS WITH INSULIN DEPENDENT DIABETES MELLITUS

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**Objective:** We aimed to evaluate the relationship between serum myostatin levels and metabolic parameters in children with insulin dependent (Type 1) diabetes mellitus and to show the relationship with sarcopenia in children with insulin dependent diabetes mellitus.

**Methods:** Forty -four patients aged between 8 and 16 years, and 45 control patients were enrolled in the study. Anthropometric measurements and laboratory analysis were performed. Serum myostatin levels were studied in both groups. Body analysis was done to the patient and control groups. Lean body mass ratio was detected.

**Results:** There was a statistically significant difference between the patient and control groups in terms of the myostatin level ( $p < 0.01$ ). The mean "Myostatin" value of the participants in the patient group (33,17 ng/ml) was significantly higher than the mean "Myostatin" value of the participants in the control group (13,60 ng/ml). There was a statistically significant difference between the patient and control groups in terms of "CPK" ( $p < 0.05$ ). The mean "CPK" value in the patient group was lower than the control group. Although there was no statistically significant relationship between myostatin values and "HbA1c", "C-peptide", "Insulin" and "CPK" variables, there was a negative correlation with "CPK", "insulin" and "C- peptide" levels and positive correlation with "HbA1c". There is a statistically significant difference between the patient and control groups in terms of the "Myostatin" variable ( $p < 0.01$ ). The mean "Myostatin" value (33.17 ng/ml) of the participants in the patient group is significantly higher than the mean "Myostatin" value (13.60 ng/ml) of the participants in the control group.

**Conclusions:** Serum myostatin levels were higher in children and adolescents with insulin dependent diabetes mellitus than in control group, regardless of muscle mass. It was found to be positively correlated with HbA1c. This result may indicate that serum myostatin levels may have potential new pathological effects on muscle mass and metabolism, especially in children and adolescents with poorly controlled insulin dependent diabetes mellitus. Further studies are needed on the subject.

**Key words:** Insulin dependent (Type 1) diabetes mellitus, myostatin, sarcopenia, children

Demographic data and laboratory parameters of the patient and control groups are given in tables 1 and 2.

Table 1. Independent t test results regarding the difference between the groups in terms of variables that conform with normal distribution.

		N	Mean	ss.	Min	Max	t	P
HbA1c (%)	T1DM	44	10,25	1,85	6,60	14,70	17,729	0,001*
	Control	45	5,23	0,32	4,50	6,00		
CPK (u/L)	T1DM	44	90,70	36,72	30	195	-2,142	0,035*
	Control	45	114,67	64,70	42	470		
Height SDS	T1DM	44	0,13	1,10	-2,06	3,13	2,851	0,005*
	Control	45	-0,50	0,97	-2,57	1,70		
BMI (kg/m <sup>2</sup> )	T1DM	44	18,62	3,33	11,20	26,80	1,13	0,258
	Control	45	17,83	3,15	13,61	28,37		
Age	T1DM	44	12,89	2,55	7,10	17,33	1,378	0,172
	Control	45	12,08	2,96	6,40	17,40		
Weight SDS	T1DM	44	0,16	0,88	-1,97	1,79	2,889	0,005*
	Control	45	-0,44	1,06	-2,35	1,89		
Fat free mass ratio	T1DM	44	81,11	5,77	16,70	61,30	-0,137	0,89
	Control	45	81,28	5,82	14,10	66,40		

Table 2. Mann Whitney test results regarding the difference between the groups in terms of variables that do not conform with normal distribution

		N	Mean	ss.	Min	Max	Median	Z	p
Myostatin (ng/ml)	T1DM	44	33,17	15,12	2,48	61,51	62,09	-6,171	0,001*
	Control	45	13,60	10,83	1,14	69,38	28,29		
Glucose (mg/dl)	T1DM	44	222,57	155,61	47	754	59,34	-5,181	0,001*
	Control	45	91,73	9,06	75	112	30,98		
C-peptide (ng/ml)	T1DM	44	0,40	0,52	0,10	2,40	25,09	-7,206	0,001*
	Control	45	2,18	1,64	0,65	8,65	64,47		
Insulin (uIU/ml)	T1DM	44	22,17	25,43	2,00	138,0	48,03	-1,097	0,273
	Control	45	14,90	16,98	2,00	77,70	42,03		
Weight (kg)	T1DM	44	46,24	13,92	21,5	72	52,55	-2,742	0,006*
	Control	45	38,77	13,95	18,0	90,0	37,62		
Height (cm)	T1DM	44	152,63	16,65	117,8	184,5	50,88	-2,121	0,034*
	Control	45	145,16	15,59	111,6	178,1	39,26		
BMI SDS	T1DM	44	0,21	0,81	-1,87	2,10	50,91	-2,134	0,033*
	Control	45	-0,32	1,09	-2,96	1,65	39,22		

Table 3. Correlation test results of the relationship between Myostatin values and HbA1c, C-PEPTID, Insulin and CPK variables of the participants in the Patient or Control group.

		Myostatin (T1DM)	Myostatin (Control)
HbA1c (%)	R	,200	,012
	P	,194	,937
C-peptide (ng/ml)	R	-,017	,015
	P	,913	,924
Insulin (uIU/ml)	R	-,045	-,062
	P	,774	,687
CPK (u/L)	R	-,128	,029
	P	,406	,852