

Effect of Reward-Based Motivation on Metabolic Control in Children and Adolescents with Type 1 Diabetes Mellitus

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Introduction

Type 1 diabetes mellitus (T1DM) is a chronic metabolic disease characterized by insulin deficiency and hyperglycemia due to autoimmune damage of the pancreatic beta cells. T1DM may cause microvascular and macrovascular complications associated with poor metabolic control. Good metabolic control is important in prevention and delay of such complications. Psychological disorders and eating disorders as well as a lack of motivation may negatively affect metabolic control in subjects with T1DM. Therefore, motivational therapy and psychological support can be needed as a part of medical treatment to improve metabolic control.

Aim

The aim of this study was to investigate the impact of reward-based motivation on metabolic control in children and adolescents with T1DM.

Methods

Forty-four children and adolescents (23 male, 27 pubertal) with T1DM with a mean age of 12.3±2.8 years (8-18 years) and a mean diabetes duration of 4.7±2.7 years were enrolled in the study. Before the study, patients were informed that three patients who will have the best metabolic control at the end of one year would be rewarded.

Exclusion Criteria;

- psychiatric disorders,
- chronic complications
- diabetes duration <1 year

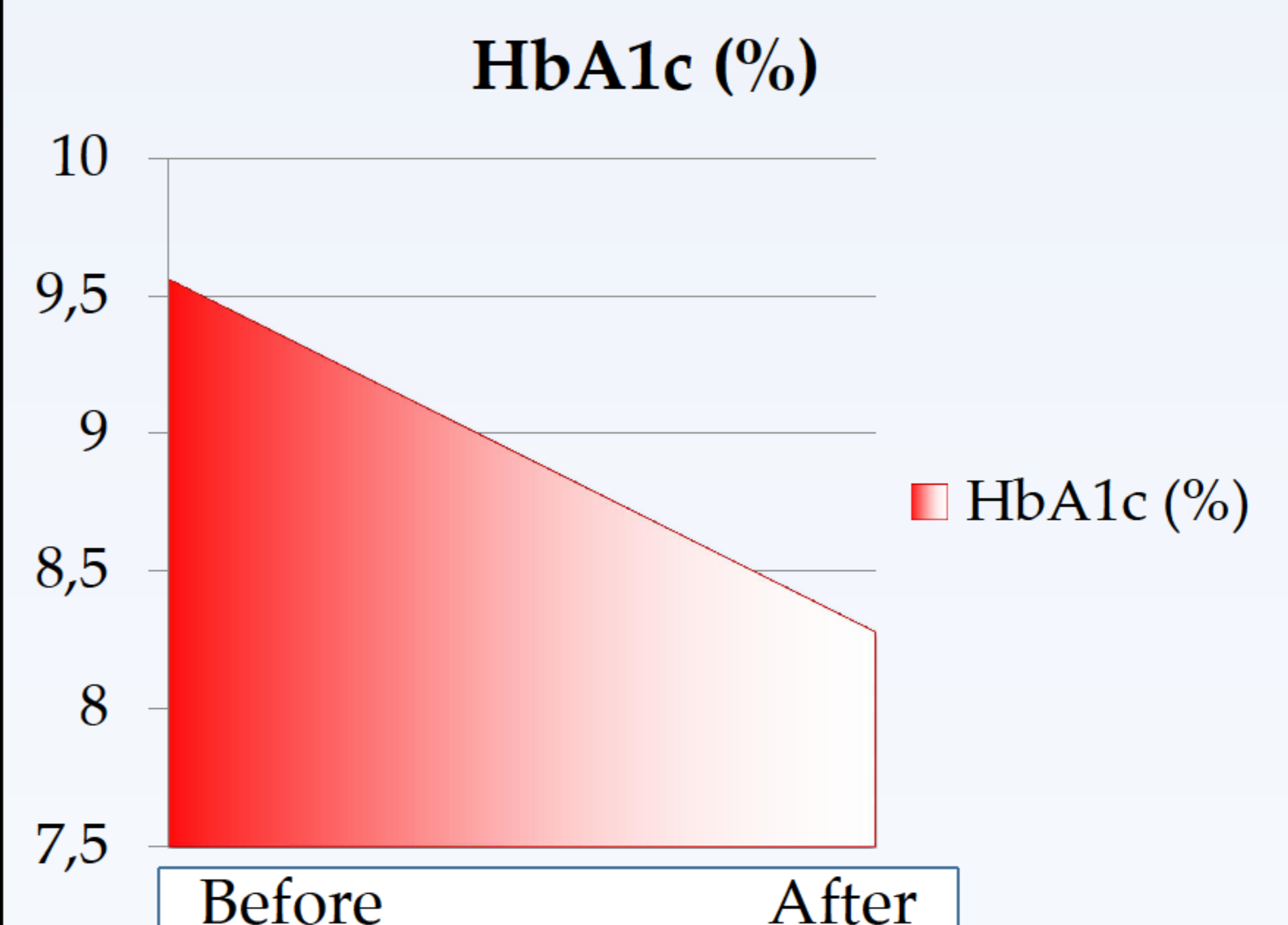
Patients were evaluated in three monthly visits during the study period by the diabetes team. The patients were divided into three groups based on HbA1c levels: good (HbA1c ≤ 7%), moderate (HbA1c >7- <9%) and poor metabolic control (HbA1c ≥ 9%). The diabetes education and dietary compliance of the subjects were assessed in each visit. Demographic characteristics and follow-up data starting from at least one year before the beginning of the study and during the study period were recorded: Age, sex, pubertal status, diabetes duration, number of control visits (four or more visits per year was considered as regular (good) follow-up), number of hypoglycemic attacks per week, daily insulin requirement (IU/kg/day) and HbA1c values. Number of control visits and hypoglycemic episodes, daily insulin requirement and mean HbA1c values were compared before and one year after study.

Results

	Before the award (n=44)			After the award (n=44)		p	
HbA1c (%)	9,56±2,13			8,28±1,65		0,032 [¥]	
Metabolic control (%)	good	moderate	poor	good	moderate	poor	
	13,6	34,1	52,3	38,6	31,8	29,5	
Mean hypoglycemic episodes / week	3,90±1,5 / hafta			2,1±2.07 / hafta		0,001 [¥]	
Mean insulin requirement (U/kg/day)	1.16±0.24			1.0±0.12		0,001 [¥]	
(Pubertal status)	Prepubertal (n=17)	Pubertal (n=27)		Prepubertal (n=17)	Pubertal (n=27)		
HbA1c (%)	8,4±1,2*	10,3±2,2* ^β		7,9±0,9	8,5±1,9 ^β		
(Sex)	female (n=21)	male (n=23)		female (n=21)	male (n=23)		
HbA1c (%)	9,2±1,8* ^μ	9,9±2,4* ^β		8,0±1,8 ^μ	8,6±1,4 ^β		
(Follow-up status)	good (n=25)	poor (n=19)		good (n=34)	poor (n=10)	<0,001 [€]	

Data are given as mean ± standard deviation

*^{μ,β,€}p<0.05, [¥]Paired Sample T test, *Mann-Whitney U test, ^{μ,β}Wilcoxon test, [€]Chi-square



The impact of reward motivation on mean HbA1c

Conclusion

This study showed that motivating activities might provide significant improvement in the metabolic control of children and adolescents with T1DM with a more evident effect in the pubertal group.

