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PERSONAL AND CLINICAL DETERMINANTS OF BRACE WEARING TIME IN ADOLESCENTS WITH IDIOPATHIC SCOLIOSIS.

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Introduction

Adolescent idiopathic scoliosis (AIS) is a three-dimensional spine and trunk deformity. Bracing is an effective treatment for medium-degree curves. Thermal sensors help monitor patients' adherence (compliance), a critical issue in bracing treatment. Some studies investigated adherence determinants but rarely through sensors and in highly adherence cohorts.

Objective (s)

We aimed to verify the influence of personal and clinical variables routinely registered by physicians on adherence to brace treatment in a large cohort of consecutive AIS patients from a highly adherent cohort.

Study Design

We performed a cross-sectional study.

Methods

We enrolled AIS patients consecutively recruited in the last three years in a tertiary referral institute and treated with braces for one year. To guarantee high adherence, for years, we have provided specific support to brace treatment through a series of cognitive-behavioral interventions to patients and parents. We analyzed the effect of personal (age, Risser stage, Body Mass Index – BMI), clinical (curve magnitude, Trunk Aesthetic Clinical Evaluation – TRACE index, Angle Trunk Rotation - ATR degrees), and brace variables (prescribed wearing hours) on real brace-wearing time, recorded through thermal sensor systematic data collection with iButton. We verified each variable's distribution and described the results using average and standard deviation in case of normal distribution, otherwise with median and 95% Confidence Intervals. We analyzed the first year of therapy, thus the period with the greater brace use and we considered the effect of the variables collected at the first clinical consultation. We finally performed a t-test for gender and a one-way ANOVA analysis for all the other categorical variables. We considered a significance level of $p<0.05$.

Results

We included 514 adolescents, age 13.8±1.6, with scoliosis worst curve of 34.5±10.3° Cobb. We found a 95% (95IC 60-101%) adherence to the brace prescription of 21.9±1.7 hours per day. Determinants included females' gender (91% vs. 84%) and age <14 years (92% vs. 88%).

Variable			Category limits (number): Adherence			F-test	P value
			Category 1	*Category 2*	*Category 3*		
Clinical	Worst curve	*°Cobb*	-			1.070	NS
	Prominence	*°Bunnel*	-			1.322	NS
	TRACE	*Percent*	-			0.741	NS
	Brace prescription	*hours per day*	23-24 (49): 87%	20-22 (145): 92%	18-19 (320): 90%	2.538	<0.1
Personal	Age	*years*	10-13 (291): 92%	14-15 (106): 88%	16-18 (117): 88%	5.434	<0.05
	Bone age	*Risser*	0 (166): 92%	1-2 (164): 90%	>2 (184): 89%	3.549	<0.05
	BMI	*kg/cmq*	-			2.171	NS

Conclusion and significance

We have identified gender, age (considered alongside bone age), and "bracing hours prescription" as critical determinants of adherence behavior. BMI, and all clinical variables (worst curve Cobb degrees, Angle of Trunk Rotation, and TRACE index for aesthetics) did not influence adherence.