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EXECUTIVE FUNCTIONS AND LEVELS OF STRESS IN DECISION-MAKING: A STUDY OF ADOLESCENTS WITH CLEFT LIP AND PALATE

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ABSTRACT:

The objective was to evaluate executive performance in the decision-making process of adolescents with cleft lip and palate. The data were obtained through the neuropsychological evaluation and the Elisa test, through the collection of saliva, to evaluate cortisol levels In 50 male adolescents with cleft lip and palate (group A) and other 46 non-fissured individuals (control) male (Group B), all aged 14 to 17 years old. The analysis of data was performed using different non-parametric tests. The performance of the groups, in terms of executive function, cognitive flexibility and stress levels did not present significant differences in statistical analysis. The Functions and competences related to failure to maintain the context, cognitive functions involved in the support of attention, motivation and using operational memory, were lagged when compared to the expected pattern of the age group, with 24% in G1 and 36,2% in G2.The results of the present study show even though they did not have a statistical difference, the performances were reduced in both groups.

Introduction

Since the middle of the 60's, the Hospital of Rehabilitation of Craniofacial Anomalies of the University of São Paulo (HRAC / USP) is dedicated to the care and rehabilitation of individuals with cleft lip and palate (CLP). The clinical practices associated to scientific research have guaranteed a humanized approach that contemplates the biopsychosocial aspects of its users (Trindade Silva & Filho, 2007). The investigation of psychosocial aspects associated with the life context of individuals with FLP constitutes an important area of knowledge production for the rehabilitation process. Traditionally, questions regarding social competence, self-concept and emotional adjustment have been investigated. The investigation of psychosocial aspects related to the rehabilitation process of individuals with cleft lip and palate (PLF) is of importance for the research in specialized centers, serving as source of reference, credibility and model of treatments. In the last decades the national (Coelho et al, 2012; Tabaquim e Joaquim, 2013) and international research (Richman, 1980, Richman & Eliason, 1984, 2001; Richman et al., 1988; Frederickson et al, 2006; Conrad et al, 2014) in the area of Neuropsychology of craniofacial anomalies, has intensified the investigation of the superior cortical functions among this population.

The cognitive abilities of a contingent of individuals with FLP, without syndromic involvement, are within the expected range for age and schooling, however, another part of this population shows impairments in memory, language and executive functions. (Marcellin, 2009, Fenimam and Lemos, 2010, Nardi & Tabaquim, 2011, Aquino et al., 2011, Joaquim & Tabaquim, 2014). Richman and Nopoulos (2008) identified in their study with this population, language problems and associated factors, as well as difficulties in naming skills. The process of rehabilitation of individuals born with FLP forces them to undergo multiple surgical procedures and clinical care throughout their growth.

The long rehabilitation condition, coupled with facial appearance and functional impairments of speech, may set a particular source of stress. Psychosocial stress has been associated with an increased risk of physical and mental illness. The activation of the hypothalamic, pituitary, adrenal (HHA) axis, as a result of stress, triggers an increase in levels of hormone cortisol that can affect the way of thinking, deciding and behaving. Marya, Endriga & Kapp-Simon (1999) point out that children with FLP on average develop in a typical way, not experiencing serious psychological problems. Despite this, 30 to 40% of them present learning difficulties, hurdle in internalizing and externalizing problems and social competence. In the last decades, a growing number of neuropsychological studies of individuals with FLP (non-syndromic) have documented that, although within a parameter of normality, a significant part of this population presents damages in several cognitive domains, such as memory, attention, language and functions (Richman, 1980; Richman & Eliason, 1984, 2001).

Confirming these findings at the HRAC / USP through the Laboratory of Neuropsychology, several studies evaluating children and adolescents were conducted in the period between 2012 and 2015, whose data have shown deficits in cognitive functions such as perceptual-motor, executive, Attentional, language and memory, but incipient in the investigation of decision making in the fissured population (Figure 1).

Figure 1. Neuropsychology laboratory studies of HRAC/USP.

AUTHORS	YEAR	OBJECTIVE	INSTRUMENTS	RESULTS
Coelho, Moretti e Tabaquim	2012	evaluate the effectiveness of a remediation plan in two	Pre and Posttest: Adult Raven; WISC-III (Execution Scale). Tasks of the remediation plan:	Significant improvement in almost all tasks, leading

		adolescents with fixed CLP and learning complaints	Scans, set of errors, space-time arrangement of figures, joints and tower cubes.	to an increase in the quotient of intelligence.
Tabaquim e Joaquim	2013	Investigate the neuropsychological functions of children with non-syndromic CLP	Progressive Matrices; Neuropsychological Examination	The most impaired functions were Operational Memory. Cognitive-Linguistic Skills.
Niquerito e Tabaquim	2013	Identify attentional competences of subjects with CLP identified with attentional impairments and low school performance.	Raven's Colorful Progressive Matrices; Trail Making Test; Visual Attention Test; London Tower; Concentrated Attention Test; Stroop Test of Colors and Words; Winsconsin Card Classification Test	Deficit in sustained attention
Jacob e Tabaquim	2014	Characterize cognitive and attentional performance	Visual attention test (Peabody images (TVIP), Neuropsychological examination (ENP) TAVIS-3), Vocabulary test	Reduced scores in the attention, operational memory and language function.
Tabaquim, Ferrari e Souza	2015	To investigate the neuropsychological perceptual visomotor functions of children with CLP	Colored Progressive Matrices, Visor Motor Gestalt and the Neuropsychological Exam.	CLP with performances < Average for the age. CLP transforame> impairment in visomotor perceptual competence
Tabaquim, Ferrari, Coelho e Niquerito	2014	Evaluate the function of visocontractive perceptual praxia in children with FLP	Neuropsychological evaluation battery BANI-TS, Bender Gestaltico Test and Raven.	Difficulties with spatial orientation, visual memory for reproduction of arbitrary symbols, Difficulties in perceptual-motor skills
Prudenciati e Tabaquim	2014	Identify pre-competences for learning to read and write children with FLP	Raven's Colorful Progressive Matrices; Assessment of Initial Reading and Writing Skills (BACLE); Phonological Abilities Profile; Boston Naming Test; Figures Rey Complex	CLP deficits of cognitive skills in skills required to acquire reading and writing skills.
Ferro e Tabaquim	2015	Trace attention profile and cognitive flexibility	TDE, TAVIS-4 WSCT	Attention difficulties and operational memory

A meta-analysis conducted by Hunt, Burden, Hepper & Johnston (2005) examined the psychosocial and cross-cultural impact of fissure. The findings indicated that men with FLP in cultures of non-English origin are more prone to psychosocial problems than women, but adults are also more affected than adolescents. The results showed that individuals with FLP presented lower psychosocial development than individuals without FLP, regardless of age, gender or culture.

Nopoulos et al. (2002) in a neuroimaging study measured the brain size of adult men with FLP and compared them with those of adult men without FLP. No differences were found in overall brain size, however, some differences were noted: a significant reduction in the volume of gray matter in the cerebellum; frontal and parietal enlargement and reduction of occipital temporal lobes of individuals with FLP in relation to the control group. It was speculated that such findings could be related to the neuropsychological performances of individuals with FLP, which may contribute to the understanding of low cognitive performance. Psychosocial factors related to the anomalous appearance of the face can cause negative impacts on the quality of social interactions and self-esteem. Boes et al. (2007) point out that FLP has been associated with increased social inhibition or shyness. The authors conducted a study to evaluate whether psychosocial factors related to the appearance of the face would lead to a low self-concept. The study included 30 boys, aged 7-12 years old, with FLP and one control group (without FLP) in the same age group. Participants were assessed in terms of social function and self-concept through standardized questionnaires that were completed by them and one of their parents. The volume and surface area of the frontal ventromedial cortex (FVC), composed of the frontal orbito cortex (COF) and straight gyrus (GR), were evaluated using magnetic resonance imaging (MRI).

The results showed that the social function of the group with cleft was significantly impaired compared to the control group. There were no differences between groups regarding self-concept. Significant differences were found in the morphology of the ventromedial cortex. In particular, the volume and surface area were decreased in the left straight gyrus (GR) of the cleft group. Frontal regions of the brain play a critical role in complex and organized human behaviors such as social interaction, executive functions and decision making. It has been extensively documented (Anderson, Bechara, Damasio, Tranel & Damasio, 1999; Blair, 2004) for the actions of the prefrontal cortex and its subcortical connections, emotion modulation and planned actions, whose emotional responses to environmental stimulus, behavioral responses that influence interaction and decision making. The relation of the social role in this cerebral circuit can be explained, in part, by the anatomy of the orbital and medial cortex. The ventral surface receives multimodal sensory information from subcortical nuclei responsible for the emotions integrating visceral, sensorial and affective signals (Ongur, Price, 2000). The locations of these structures set informational flow paths through which sensory input can influence affective and cognitive processes by directing and interfering with complex behavioral actions.

These findings point to the importance of neuropsychological assessments and interventions as part of the rehabilitation process administered by FLP health teams. Affective and social compromises, coupled with specific cognitive impairments, can configure potential risk conditions for brain processing in complex actions that require the integrated functioning of different domains, such as the operationalization of executive functions.

Behaviors that allow the individual an intentional and planned

interaction involve the elaboration of an action strategy based on previous experiences, as well as stimuli or demands, present in the environment. Such activities need to be flexible, adaptive and monitored at each stage of implementation. These operations are called executive functions (Gazzaniga, Ivry and Mangun, 2002). Executive functions relate to the control and regulation of information processing in the brain. Executive functions consist of a set of cognitive conditions necessary to manage contingencies and demands in function of a goal. The literature presents a variety of processes included in the category as: problem solving, selective inhibition of behavior, decision, cognitive flexibility, (Majolino, 2000).

The prefrontal cortex (CPF) is located in the anterior region of the brain. Due to its human CPF extension have been referenced as responsible for the neural activity of higher cognitive functions, which, as a result of phylogenetic differentiation and by force of evolutionary adaptations, became the main characteristic of our species.

Historically in the field of neuropsychology, executive functions are anatomically associated with the frontal networks of the cerebral cortex. The production and management of executive processes have been identified as a central function of the prefrontal cortex (CPF) through the retrieval and archiving of memory information based on sensory information. Behaviors that allow the individual an intentional, planned interaction, involve the elaboration of an action strategy, based on previous experiences, as well as on stimuli or demands present in the environment. These operations are called executive functions (Gazzaniga, Ivry and Mangun, 2002). Behaviors that allow the individual an intentional and planned interaction involve the elaboration of an action strategy, based on previous experiences, as well as stimuli or demands present in the environment. Such activities need to be flexible, adaptive and monitored at each stage of implementation. These operations are called executive functions (Gazzaniga, Ivry and Mangun, 2002). Executive functions relate to the control and regulation of information processing in the brain. Executive functions consist of a set of cognitive conditions necessary to manage contingencies and demands in order to achieve a goal. Literature presents a variety of processes included in the category, such as: problem solving, selective inhibition of behavior, decision-making, cognitive flexibility, (Majolino, 2000).

The present study

The present study aimed to answer the following questions: Do subjects with cleft lip and palate present adaptive and functional levels in terms of executive function and decision making? Are there any significant differences in the executive performance of decision making of adolescents with CLP compared to a control group? Do different cortisol levels influence performance in decision making? If so, are there significant differences between individuals with CLP and the comparative group? The present research had an exploratory character with the potential to subsidize the understanding of behavioral data related to the psychological risk and to the protection of adolescents with CLP.

Methods

A total amount of 96 male adolescents, aged 14 to 17 years old, participated in the study comprising two groups: GI, formed by 50 participants with repaired FLP. GII, with 46 adolescents without FLP. The inclusion criteria for participation in the GI study was to have a diagnosis of cleft lip and palate, enrolled in the HRAC / USP, to be in the age range of the study, and the authorization of parents or guardians. To formally consent to spontaneous participation in research. The inclusion criteria for the GII consisted in formally consenting to the participation of the research, presenting age at the proposed age range, to be regularly enrolled at schools of the official public school network and having parental consent. Exclusion criteria for both groups were those of having a syndromic diagnosis, sensory or neuropsychiatric deficiency. Present interfering systemic disease in the immune system. Make use of neurological and / or psychiatric medications.

Instruments

The instruments used to collect data from the survey were Raven's Progressive Matrices (Raven, 1979), Winsconsin Sording Card Classification Test - WSCCT (Heaton et al, 2005), Iowa Gambling Test - IGT (MALLOY-DINIZ et al, 2008) and Measurement of Cortisol Levels by ELISA Test (for Saliva, Enzyme Linked Immunosorbent Assay).

Ethical research procedures

The project was submitted to the Research Ethics Committee of HRAC / USP, approved by the opinion of n. 885800 of 11/17/2014. In order to participate in the research, the subjects and caregivers were informed and invited, followed by the formalization through the signatures of both in the Term of Free and Informed Consent in accordance with resolution 466/2012 of the National Health Council. In the end, Anonymity and privacy, preserving their right of not to accept or interrupt their participation, if they so wished, without this being likely to cause embarrassment or loss of attendance at the institution. In the GI, the contact occurred directly during the hospital routine; In the GII, after authorization from the participating institution, occurred personally with the adolescent in a school context, complemented by the terms of assent and consent addressed to parents or guardians. The adolescents who had the terms of consent duly authorized were considered in the screening of the research.

The GI participants were identified by consulting the HRAC-USP Data Processing Center (CPD) section. Subsequently, a specific time schedule was requested in the scheduling sector compatible with the patients' return for routine ambulatory or surgical services in the hospital.

G2 participants who had the duly authorized consent terms were submitted to the eligibility criteria to be considered participants in the study. The administration of the neuropsychological tests for the GI occurred in the Laboratory of Neuropsychology of the Hospital of Rehabilitation of Craniofacial Anomalies - USP, being careful with the privacy and orientation about the objectives of the collection procedures. At the end of the evaluation process, the results were returned to the participant and parents or guardians, partially repaying the collaboration provided in the project.

The administration of the tests for G2 occurred in the facilities of the Mirim de Araçatuba Foundation. The institution serves adolescents between the ages of 14 and 18, of both genders, among whom many are in situations of social vulnerability. It is a cultural and educational association that provides educational and professional assistance to adolescents in situations of personal and social risk, as well as, low income youths seeking their insertion in the job market. Taking care of the privacy, guidance on the research objectives was performed data collection. At the end of the evaluative process, the results were returned to the participants, parents or guardians and the school, partially repaying the collaboration provided.

The evaluation of the intellectual level consisted in the administration of the RAVEN Intelligence Test, seeking the identification of logical non-verbal intellectual visuospatial reasoning. The instrument was applied individually, according instrument regulations. This procedure lasted approximately 15 minutes.

For the evaluation of executive functions and cognitive flexibility, the Wisconsin Card Test - WSCT was administered with an average time of 20 minutes, applied individually. For the neuropsychological analysis, the scores / percentiles on "perseverative errors, completed categories, tests to complete the first category, failure to maintain the context and learning to learn were considered".

At the end of the WSCT, the patient's saliva sample was collected for

later analysis using the ELISA Test to analyze the level of cortisol, an indication of the stressors experienced by the participant, during internal and external pressures of An evaluation process.

The Elisa test for the detection and quantification of cortisol was performed at the Laboratory of Pharmacology and Genetics of the School of Dentistry of Bauru of the University of São Paulo (USP) under the guidance of Lucimara Teixeira das Neves MsC, PhD, co-supervisor of this study with the HRAC / USP Graduate Program. The cortisol analysis followed the guidelines of the Sigma-Aldrich technical bulletin, catalog number Se120038.

The participant was then submitted to the decision-making process through the Iowa Gambling Task (IGT). Participants were presented with 4 virtual card decks on a computer screen. He was told that every time he choses a card, he could randomly win or lose some money in the game. As the goal of the game is to earn as much money as possible, each participant has the possibility to obtain a reward as well as a penalty. The platforms differ from each other in the number of trials on which losses are distributed. So some platforms are "bad decks", and other platforms are "good decks" because some will lead to long-term losses, and others will lead to gains.

The instrument has four blocks of cards (A-B-C-D) and one with the total of choices (E). The letters A and B represent a negative block and C + D are the blocks of positive cards that are chosen during the task. Blocks A and B reward and punish the examinee with larger values; Blocks C and D, also reward and punish, but with lower values. Individuals who are very sensitive to immediate reward and unresponsive to punishment tend to choose from A and B. Negative outcomes imply unsatisfactory performance, not sufficiently organized for elaborate choice responses.

The application of the neuropsychological instruments of data collection had an average duration of 50 minutes, due to variability in conditions of availability, fatigue and interest of the participant.

Data Analysis

The analysis of the research data was performed using a normality test, verifying the non-distribution normal of the data. For this reason the use of a non-parametric approach was used in the data analysis by Mann-Whitney Rank Sum Test; Chi-square, Spearman Rank Order Correlation; Kruskal-Wallis One Way Analysis of Variance on Ranks.

Results

In order to contemplate the objectives proposed in this study, information about the studied population (G1 and G2) was presented, followed by the results obtained through the instruments used in the data collection. The stratified analyzes were also demonstrated based on the comparison of the results (Table 1).

Table 1. Caracterization of participants in the study

Participants	n	Gender	Avarege age	Schooling		
				ES	EM	CE
G1	50	Male	16 y/o	9	40	1
G2	46	Male	16 y/o	8	38	-
Total	96	Male	16 y/o	17	78	1

Legenda: ES (Elementary School); HS (High School); CE (College Education).

Comparing the ages between the groups using the Mann - Whitney Rank Sum Test non - parametric test, no significant differences were found between the groups, since the participants were distributed in a balanced way in the age group of 15 to 17 years (Table 2) .

Table. 2 Comparing groups by age.

Age	S	Avarage	25%	75%	Avarage	P.D	p
G1	50	15,7	15,1	17,1	16,0	1,1	p=0,965
G2	46	15,7	15,2	17,0	16,0	1,1	

Legenda: s (sample); P.D (Pattern Deviation).

The Chi-square test was used to compare the intelligence level, using the Raven Progressive Matrix test, considering the categories of the protocol. A statistically significant difference was found between the groups in the discrepant classification category (Table 3).

Table 3. Ravens's Progressive Matrices Test – General Scale

Groups	G1		G2		
Categories	s	%	S	%	
Discrepant	0	0,0	10	21,7	p= 0,003*
Evidence of Disability	9	18,0	12	26,1	
Lower than avarage	19	38,0	12	26,1	
Avarage	20	40,0	12	26,1	
Above Avarage	2	4,0	0	0,0	

It was found that, when comparing the performances between G1 and G2, there was a representative discrepancy score in G2, indicating a pattern of random responses.

The Mann-Whitney Rank Sum Test was used to compare the performance of the decision-making test with the IGT, and no statistical significance was observed between G1 and G2. G1 presented a mean of -2.9 and G2 -3.7 indicative of impulsive choices, suggesting hypersensitivity to immediate reward and hyposensitivity to punitive consequences. Thus, it was identified that both groups performed well below an adequate executive decision-making (Table 4).

Table 4. Iowa Gambling Task Representation

C +D – A+ B	n	Avarage	25%	75%	Avarage	P.D	p
G1	50	-4	-14	6,0	-2,9	13,5	8,51
G2	46	-4	-10,5	0,0	-3,7	10,9	

When comparing the cortisol levels between the groups, it was verified that the results, with indicators in normality, when analyzed statistically, did not have significant difference (p = 0.773), indicating the homogeneity in cortisol levels (Table 5).

Table 5. Percentage Representation of Elisa Test, regarding avarage, medium and pattern

Cortisol Ng/ml	s	Medium	25%	75%	Avarage	P.D	p
G1	50	7,6	6,8	10,1	9,7	7,5	p=
G2	46	7,2	6,9	9,4	9,8	6,2	0,773

The comparison between decision-making performance and cortisol levels, performed by the Spearmam Rank Order Correlation test, did not identify significant differences between groups (Table 6). The number of participants in the IGT comparison and cortisol levels was 89, considering the need for calibration.

Table 6. Representation of Comparison among IGT and cortisol level.

IGT	Cortisol Ng/ml	Unit Content

B1	- 0,02 0,833 89	Unit Content P N
B2	0,06 0,552 89	Unit Content P N
B3	-0,09 0,425 89	Unit Content P N
B4	0,05 0,621 89	Unit Content P N
B3	0,11 0,321 89	Unit Content P N
B5	0,09 0,409 89	Unit Content P N

Legend: B1 at B5 (block of cards); P (p-value); N (participants number)

The groups were compared in terms of executive functions and decision making. No statistically significant differences were found, according to the Kruskal-Wallis One Way Analysis of Variance on Ranks (Table 7).

Table 7. Representation of comparison among groups G1 and G2 relativeto the executive functions (WSCT) and decision taking (IGT).

	N	Medium	25%	75%	Avarage	p.d	p
Complete Categories							
Adequate	84	-4,0	-12,0	2,0	-3,7	12,4	
Fast Moderate	3 3	6,0 -2,0	-10- 16,0	10,0 20,0	2,0 0,7	10,6 18,1	p=0,559
Severe	6	0,0	-7,0	5,0	-1,3	8,6	
Test for frist category							
Adequate	81	-4,0	-12,0	2,0	-4,2	12,4	
Fast Moderate	7 3	0,0 -2,0	-8,0 16,0	14,0 10,0	1,4 -2,7	9,8 13,1	p=0,115
Severe	5	6,0	-3,0	14,0	5,6	9,5	
Failure to mantein context							
Adequate	67	-2,0	-12,0	4,0	-1,8	13,1	
Fast Moderate	4 9	-8,0 -2,0	-9,5 -9,0	-5,0 2,0	-7,5 -2,7	2,5 6,9	p=0,196
Severe	16	-9,0	-16,0	-2,5	-8,9	10,7	
Learning to Learn							
Adequate	84	-4,0	-12,0	1,5	-4,0	12,4	P=0,056
Rigid	12	4,0	-4,0	8,0	1,5	10,5	

DISCUSSION

The results obtained in the present study were described and analyzed in order to understand the cognitive resources of young people with cleft lip and palate. The literature has described that the condition of the facial anomaly of this population has influence on the academic, social and emotional development, independently of the identified intellectual levels (Graciano, Tavano, Bachega, 2007).

Cognitive-language deficits, reading and writing difficulties, and operational memory in studies of FLP individuals have been documented (Richman, 1980; Richman & Eliason, 1984; Tabaquim and Joaquim, 2013; Prudenciati, Hage & Tabaquim, 2017). However, the results of the present study differ from previous studies regarding the verification of deficits in cognitive performance and neuropsychological functioning of individuals with cleft lip and palate, since no differences were observed between the groups, thus demonstrating that adolescents with cleft Lip and palate presented executive performance similar to the adolescents in the control group. Despite this, some observations are important for understanding and discussion.

In the comparison of the groups, there was no difference in performance regarding the age of the participants, which ranged from 14 to 17 years with an avarage age of 16 years. However, it is important to emphasize that the present study had the reference of a group considered social vulnerability, where behavioral and psychosocial factors may have interfered in the performance of tasks. Even though they did not have a statistical difference, the performances were reduced in both groups, in relation to the aspects related to attention support, motivation and operational memory. The existing literature on increased risk factors and minimized protective factors, interfering with the cognitive and psychosocial development of children and adolescents, is indicative of relevant conditions in a clinical diagnostic evaluation of low academic performance (UEHARA & LANDEIRA-FERNANDEZ, 2010; PALEAREI, TABAQUIM, 2013).

In the comparison of the groups on the intellectual level, there was a statistically significant difference ($p = 0.003$) where G2 showed a marked "discrepant" behavior in the Raven Progressive Matrix test. Checking the consistency of the results, it was observed that 21% of the reference group (G2) sample were of non-consistent cases, that is, they reached discrepancies greater than + or - 2. The discrepancies in the standardized test results are understood in the reliability of the response, and may be associated with having been given at random by the examiner (RAVEN, 1979). Given this scenario it is possible to infer that motivational factors may have interfered in the performance of the participants during the administration of the test. Because they are not in a context of health care, such as in the hospital environment, where invitations to spontaneous participation in research and evaluation procedures are frequent in the treatment process, G2 members may not have assigned the same importance as the G1.

Conrad et al. (2009) in a comparative study evaluated the language, perception, memory and executive functions of youngsters with and without FLP. The results showed significant differences in the FLP group, which showed a deficit in language functions and verbal memory, but did not present differences in terms of executive function. In the present study there was also no difference between the groups when compared in the performance of executive functions. Executive functioning refers to the joint and integrated action of the various cognitive domains that allows the elaboration of planned and goal-directed actions (Malloy-Diniz, Fuentes, Sedó & Leite, 2008). Some authors classify executive functions in "hot" and "cold" (Zelazo & Muller, 2002) a distinction between the development of affective aspects called "hot" that are associated with the orbitofrontal cortex (OFC) and the development of more cognitive aspects associated with the dorsolateral prefrontal cortex (Met-calfe & Mischel, 1999) called "cold". Decision making configures the executive stage in which it is necessary to reconcile the conflict between available choices in the context of a set of rules, as well as to control the impulses of immediate reward in favor of a choice that may be more assertive, despite a future reward occurs later. The results of this study allowed us to understand that, although the groups did not have statistically significant differences, a contingent of both showed impairments in the executive abilities of cognitive flexibility and decision making.

First, the WSCCT was applied. In spite of the errors that evaluating it can commit in the discrimination of the combination criteria and the possible discomfort due to that, compared to the IGT the WSCCT can be considered an evaluation of characteristics more "cold." The IGT, in turn, besides the discomfort of the bad Choice, presents concrete consequences such as loss or monetary gain, which accentuates the affective influence of future choices. Comparison of salivary cortisol levels, collected after WSCT administration and

prior to IGT, showed a similar mean (9.7 Ng / mL G1 and 9.8 Ng / mL G2), with no statistically significant difference (p = 0.773), Indicating homogeneity in cortisol levels between groups, and therefore, equivalent stressor pattern, in normality parameters.

Considering G1, the target group of this study, it is known that the rehabilitation process of the cleft lip and palate, regardless of the type affected, is long, being closely associated with the complexity of the cleft, which may occur alone or in association with the lip, alveolar ridge, palate Primary and secondary, and may be associated with other genetic and clinical syndromes, although it is not pertinent to the present sample (Freitas et al, 2012; Razera, Tretten, Tobacco, 2016). It is understood that the restorative surgeries promote great expectation, both of the individual, as well as of the family and the social circle in which it is inserted.

However, the rehabilitation process is not restricted to anatomical repair of the fissure, since it affects functions such as speech, hearing, occlusion development and craniofacial growth, as well as interfere in the psychological, academic and social development (PARAIBA ET AL, 2011; RAZERA ET AL, 2016). However, the present study demonstrates that the coping ability of young people with FLP, who made up the sample, did not prove to represent stressful conditions in contingency decision making.

From the perspective of coping strategies, Cognitive Psychology characterizes coping as a series of tactics used by the individual in an attempt to adapt to a specific stressful demand. Coping can be focused on emotion when it is designed to change the emotional state to reduce unpleasant physical sensations from the stress state. Coping can also be focused on the problem, when it aims to change the existing situation in the relationship between the individual and the environment. Both types have the function of managin stress can be overwhelming in people with greater vulnerability, due to lived experiences, personality characteristics, received training education, among other risk factors and protection. In a vertiginously opposing condition, it can be considered that young people with risk factors for developmental changes experience atypical situations that may strengthen the coping ability and resolution of practical and affective problems, characterizing coping (JOAQUIM, TABAQUIM & VALLE , 2014). In this way, it is understandable that adolescents with cleft lip and palate use coping, the intrinsic efforts to cope with chronic or acute situations in daily life and, therefore, to develop compensatory strategies in an attempt to adapt to a Specific stressful demand (RAZERA ET AL, 2016).

Adolescence begins at puberty, a phase in which morphological and psychological changes occur that approach adulthood. According to the World Health Organization, individuals between 10 and 19 years of age are considered adolescents. Adolescence is a period in which attitudes, values and behaviors are established in relation to behavior, which begin in childhood, coming from the family. Frequently, clinical complaints in the hospital routine of young people with FLP at the participating rehabilitation hospital indicate the difficulty of incorporating targeted treatment habits, whose behaviors reflect the lack of adherence to the changes for adaptation in the daily routine. Thus, the results of the present study, which pointed to the executive functions preserved in a percentage of young people who composed the sample, suggest that the lack of engagement in the activities may be due to ineffective educational practices, rather than limitations in cognitive resources of executive functions.

Adolescence is a phase of changes and questioning of values acquired in childhood, where, taking responsibility for oneself or another, implies psychological maturation, preparing the being for adulthood. Often this scares the young man and can lead him to remain in a comfort zone of dependence, where the family can reinforce (without conscious intention) the behaviors, infantilizing them. In the present study, a percentage of G1 had a lower level of logical reasoning, implying cognitive limitations in terms of generalization of information and deductive understanding of subjective situations. This aspect could be considered a contributing factor to the difficulties in incorporating rules and independence in the activities of daily living. However, considering cognitive performance related to flexibility to identify and solve problems (according to the WSCT and IGT), dependent and immature behaviors suggest to be due to overprotective contexts, limited in understanding the impact of the effects on the formation of the adolescent, such as the fragility in the engagement to chronic treatments. In this regard, they know what they should do, but expect to be led.

CONCLUSION

The difficulty of incorporating procedures and habits of fundamental importance for the process of rehabilitation of young people with FLP is a frequent complaint of professionals who work in the process of rehabilitation in the hospital routine. This study allowed us to conclude that the performance of the groups, in terms of executive function, cognitive flexibility and stress levels did not present significant differences in statistical analysis, although functions and competencies related to failure to maintain the context, cognitive functions involved in sustaining attention, motivation and use of operational memory, were lagged in relation to the expected pattern for the age group, with 24% of damage in G1 and 36.2% in G2. Such lack of engagement and treatment-oriented care often reflect a lack of adherence to changes in the adaptation of the rehabilitation process to the daily routine. Thus, the results of the present study, which pointed to the executive functions preserved in a percentage of young people who composed the sample, suggest that the lack of engagement in the activities may be due to ineffective educational practices, rather than limitations in cognitive resources of executive functions.

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