

CHANGES IN BLOOD PRESSURE IN CHILDREN UNDERGOING PSYCHOLOGICAL TREATMENT BEFORE DENTAL PROCEDURES

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ABSTRACT

Different dental procedures in children undergoing treatment can induce changes in blood pressure. These changes will be minimized if psychological treatment is applied prior to any procedure. The objective of this study was to determine changes in blood pressure (systolic-diastolic) in children undergoing psychological treatment before dental procedures. The population studied consisted of 100 children and adolescents, ages 6 to 15 years. The patients were assigned to two groups at random, i.e. with or without psychological treatment before dental procedures. Behavior management was carried out applying the tell-show-do technique of conduct handling. The systolic and diastolic blood pressures were measured prior to the initi-

ation of the treatment, during drilling, restoring, and before dismissing the patient. The no-psychological treatment group exhibited significant differences in diastolic and systolic blood pressures during the dental procedure whereas the psychological treatment group evidenced no significant differences in blood pressure. No correlation was found between the alterations of blood pressure and the type of dental treatment performed. The application of the tell-show-do method would have an effect on the blood pressure in patients undergoing dental procedures.

Key words: blood pressure, dental procedure, psychological therapy.

CAMBIOS DE LA PRESIÓN SANGUÍNEA EN NIÑOS QUE RECIBEN TRATAMIENTO PSICOLÓGICO PREVIO A LA REALIZACIÓN DE UN PROCEDIMIENTO ODONTOLÓGICO

RESUMEN

El objetivo de este trabajo fue determinar los cambios de la presión sanguínea (sistólica-diastólica) en niños que reciben tratamiento psicológico previo a la realización de un procedimiento odontológico. La población estudiada estuvo conformada por 100 niños y adolescentes en edades comprendidas entre los 6 y 15 años. Los pacientes fueron asignados al azar en dos grupos: con o sin tratamiento psicológico previo. En cuanto a la variable terapia psicológica, se aplicó la técnica conductual decir-mostrar-hacer. Las presiones sistólica y diastólica fueron evaluadas antes y durante el procedimiento clínico y después de darle de alta al pacien-

te. El grupo que no recibió terapia psicológica mostró diferencias significativas en la presión diastólica y sistólica durante el tratamiento a diferencia del otro grupo que no mostró variaciones significativas. Asimismo, no se encontró correlación entre las alteraciones de la presión sanguínea y el tipo de tratamiento recibido. Los resultados sugieren que la técnica decir-mostrar-hacer podría tener un efecto moderador sobre la presión sanguínea en pacientes que reciben tratamiento odontológico.

Palabras clave: presión sanguínea, manejo conductual, tratamiento psicológico.

INTRODUCTION

Dental fear is frequently observed in paediatric patients at dental care centres. This emotional factor can produce several physiological responses affecting blood pressure during the dental treatment (1,2). Dental anxiety seems to be related to dental fear, socioeconomic level of the family, and former den-

tal treatment experiences (3,4). The acceptance of dental checkup and the subsequent treatment can improve the child's behavior, decreasing his/her stress and allowing for an adequate management of the child (3-12). The aim of this investigation was to determine the changes in blood pressure (systolic-diastolic) in children undergoing psychological

TABLE I. Value of blood pressure in children, with or without psychological treatment before odontological treatment.

Period of Measurement	Systolic Pressure		Diastolic Pressure	
	Control X±SD	PT* X±SD	Control X±SD	PT* X±SD
Pre-treatment	103.9±11.2	100.9±9.7	67.4±8.4	65.4±8.6
During treatment	109.5±11.2a	105.5±7.9	71.0±8.1a	67.6±8.3
Post-treatment	104.0±10.1	103.7±9.6	66.3±7.8	66.3±9.0

* Psychological treatment group.
a Statistically significant difference with PT group (p<0.05)

treatment before dental procedures in the child dental care center of the Faculty of Dentistry of the University of Zulia, Venezuela.

MATERIALS AND METHODS

The population studied consisted of 100 children and adolescents, ages 6 to 15 years, who were treated in the Child Comprehensive Care Center (CCCIC) at the Faculty of Dentistry of the University of Zulia. Parents were informed of all the details of the investigation and their written consent was required for the child's participation. All studied patients had not received any previous dental treatment and were in need of dental care. At random, half of the patients were assigned to the control group that did not receive any psychological treatment before the dental treatment. The other half received psychological support treatment prior to the odontological procedure. Both groups were similar in age range and gender distribution. The behavior management was carried out applying the Tell-Show-Do technique of conduct handling (13,14), which constitutes the action rules of the educational phase to induce, in the dental pediatric patients, a relaxed and tolerant behavior. The technique is simple and generally very useful. Before beginning any dental treatment, except the injection of local anesthetics and other procedures that do not admit explanation, such as pulp extirpation, the procedure to be carried out is explained to the child, using suitable vocabulary according to his/her age. The actual procedure is then simulated and finally a hand mirror is used by the patient to observe what it is being done. The type of child, according to his/her psychological behavior, was determined using Gomez Herrera's scale (15). The blood pressure of all patients was taken three times, i.e. before, during

and after the dental treatment. Normality of blood pressure values was established in keeping with the previously reported table of values of Venezuelan children (16). The patients whose blood pressure values were higher than the percentile 95 were excluded from the study. The data were analyzed by ANOVA; statistical significance was set at P<0.05.

RESULTS

The no-psychological treatment group had a significant difference in their diastolic and systolic blood pressure during the dental procedure in comparison to the psychological treatment group (Table 1 and Fig. 1). No correlation was found between the alterations in blood pressure and the type of dental treatment performed.

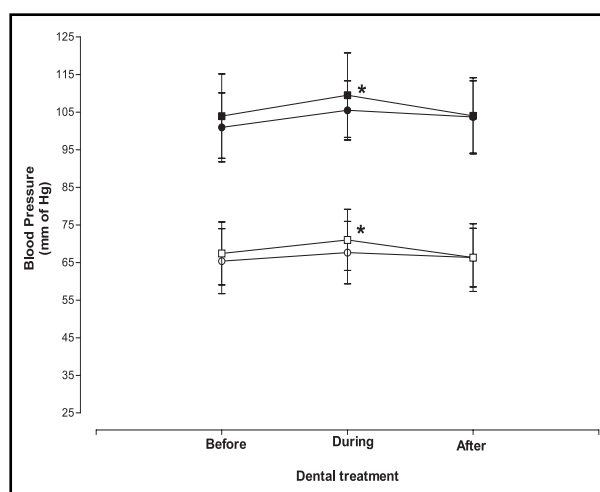


Fig. 1. Value of blood pressure in children, with or without psychological treatment, under odontological treatment. Diastolic pressure: DP, systolic pressure: ST, with psychological treatment: PT, without psychological treatment: WPT. ○: DP PT, □: DP WPT, ■: SP PT, ●: SP WPT.

TABLE II. Mean systolic and diastolic blood pressure variation in children with and without psychological treatment before dental treatment.

Study Groups	Mean blood pressure variation	
	Systolic Pressure	Diastolic Pressure
Control	8.60 ± 1.61*	6.64 ± 0.91
PT	2.20 ± 0.991	2.27 ± 1.242

* Mean ± S.E.M.
1 Statistically significant difference with Control group (p< 0.0001)
2 Statistically significant difference with Control group (p< 0.01)

Table 2 shows the mean of systolic and diastolic blood pressure variation in children with and without psychological treatment before dental treatment. Significant differences were demonstrated between control and treatment groups for both systolic and diastolic blood pressure variations.

DISCUSSION

Several studies suggested that dental procedures might stress the patients and thus affect the cardiovascular system (2,5,6,17). This stress can produce an increase in blood pressure in adults and infant patients (3,12,18,19,20,21). In this study, a significant increase in blood pressure was found in those patients who were treated without using psychological support. This difference may be due to mental stress (fear, anxiety, pain, etc.) produced in children undergoing dental therapy.

On the other hand, considerably controversy exists in the literature regarding the hemodynamic response caused by local anesthesia with or without epinephrine (5,6,19,20). A significant increase in blood pressure was found (12) during the restorative dental treatment in patients treated without a local anesthetic, whereas in patients treated with a local anesthetic containing epinephrine, no significant increase in blood pressure was recorded. In the present study, all pediatric patients received local anesthetic with epinephrine, and only those children under psychological support did not show any increase in blood pressure. This can be explained by the use of the Tell-Show-Do technique (16). This technique can decrease the anxiety in children

undergoing dental treatment. Other psychological support techniques such as Virtual Reality (VR) have been described for adult and infant patients (7,22,23). While the early studies (22,23) described the positive effects in adult subjects, the latest study (7), which assessed the effects of VR on child behavior and anxiety in a dental setting, did not observe significant differences in the pulse of these children associated to the use of VR. These findings suggest that if the child cannot see or hear what is going on around him, anticipation and negativity may be increased. It is important to point out that dental anxiety is frequently observed in pediatric patients and that it has a multifactorial etiology that includes previous experience (24,25). None of the patients in this study had received previous dental treatment.

In this study, no correlation was found between the blood pressure alterations and the type of dental treatment performed. We previously reported that the kind of restorative dental technique (filling, pulpotomy or stainless steel crown) did not affect the changes in either the blood pressure or the pulse rate (19).

In conclusion, the application of the Tell-Show-Do method in infant patients undergoing dental procedures had a significant effect on blood pressure during or after dental treatment. It is important that dentists inform pediatric patients about the procedures to be used and obtain their consent. This will probably contribute to the patient being effectively relaxed during the procedures. The reduction in the children's dental anxieties is an important part of dental treatment, and this method can be effectively used.

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