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Management of Gagging and Anxiety in Children by Play Way Method

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Original Article

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ABSTRACT

Introduction: The gag reflex (GR) is an innate healthy defense mechanism that helps prevent foreign bodies from entering the trachea. Psychological, anatomic, iatrogenic, local, and systemic factors influence the GR. The pharyngeal reflex that prevents choking involves five triggering zones in the oral cavity: the palatoglossal and palatopharyngeal folds, the post-pharyngeal wall, the uvula, the palate, and the base of the tongue. So, this study is undertaken to determine gag reflux using the Intellectual Colored game distraction technique during the dental impression.

Aim: The aim of this study is to determine the effect of distraction using the intellectual colored game (ICG) on the severity of GR and anxiety in children during the dental impression.

Methodology: 50 children aged between 5 to 11 years, needing upper alginate impressions will be selected for the study and will be divided into 2 groups of 25 each. Children's baseline anxiety will be evaluated according to the Buchanan's Facial Image Scale (FIS) before any impression attempt. In Group 1 the upper alginate impression will be taken without playing ICG and group 2 upper alginate impressions will be taken while playing ICG.

Result: Statistical analysis showed that 28% and 76% of children from the control and treatment groups respectively had a higher level of anxiety before the use of the distraction technique. However, 12% and 4% of children had higher anxiety after the use of distraction technique and a statistically significant change in anxiety in the treatment group with existing anxiety level ($Z = -3.412$, $p = 0.001$) was observed.

Conclusion: Intellectual distraction is a safe, successful & cost-effective method for gag reflux management in pediatric dentistry. The Intellectual coloured game diverted the child's attention during the stressful alginate impression, henceforth it should be considered to further advance behaviour management techniques.

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Keywords: Intellectual Coloured Game, Anxiety, Fear, Gag, Alginate Impression.

Introduction

Gagging is one of the protective reflexes of the body. In some people, it is found to be reduced or absent, or pronounced.[1] Pronounced gagging compromises many procedures that include-Diagnostic and radiographic procedures which lead to the avoidance of the treatment. Many techniques have been described to avoid or overcome this problem.[2]

What is Gagging? There are various definitions for gagging out of which the working definition of gagging is "Gagging is stimulated, protective reflux response to prevent material from entering mouth or oropharynx". Gagging is a stimulus, maybe physical, auditory, olfactory, and psychologically mediated which leads to muscular contraction and provokes vomiting.[2] According to **Savage and MacGregor** 'retching or gagging is an ejector contraction of the muscles forming the pharyngeal sphincter'.[3] There are two categories under which gagging reflux takes place- One in which Neural Pathway is involved and another in which psychological reason behind the gag reflux. The gagging reflex is not anatomically dependent on-site rather that it is dependent on the fifth, ninth, and tenth cranial nerves.[4] Newton felt that visual conditioning plays a very important role in psychosomatic gagging.[5] Distraction is a behavior management technique in which the patient is distracted away from the stimuli triggering anxiety and thereby reducing it. Mc Caul and Mallet pointed out that an individual should focus on the painful stimuli in order to perceive pain; therefore, perception of pain decreases when a person's attention is distracted away from the stimulus.[2] One of the techniques is distraction by intellectual games. Intellectual distraction is a safe, potentially effective, and cost-saving method of GR management in pediatric dentistry. The clinical efficacy of the distraction tactic is of significant interest since parents frequently prefer non pharmacological interventions.

So, the aim of the study is to assess the effect of distraction using the intellectual-colored game (ICG) on the severity of Gag Reflex and anxiety in children during the dental impression.

Materials and Method Subjects: The study was conducted on 100 children between age 5 to 12 years needing maxillary alginate impressions, reported to the Department of Pediatric and Preventive Dentistry, PCDS, and RC. Approval from the Institutional Ethical Committee and parents' written informed consent will be obtained before study execution.

Children with ages of 5 to 12 years and Children with no relevant medical history were included in the study. Children's excluded from the study who are under 5 and above 12 years of age, or with any systemic disease and illness, handicapped child and children with severe Gag reflux.

Overall 100 subjects were selected under this study and are divided into two groups i.e. 50 subjects in each group. Group one–Case Group and Group Two–Control Group In the **Case Group** (Group 1) upper and lower alginate impression was taken while playing ICG (Intellectual Colored Game) and in the **control group** (Group 2) the upper and lower alginate impression was taken without playing ICG (Intellectual Colored Game).

The GR grade was evaluated before the impression procedure using the classification of gagging problem index as proposed by Saita et al.[6]

- G1: Normal gagging but not desensitized (the child tolerates a basic periodontal examination with a probe).
- G2: Mild gagging (the child does not tolerate the basic periodontal examination with a probe).

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- G3: Moderate gagging (the child does not tolerate molar region examination with a dental mirror).
- G4: Severe gagging (the child does not tolerate anterior teeth examination with a dental mirror).
- G5: Very severe gagging (the child does not tolerate momentary insertion of the dental mirror).

Children's baseline anxiety was evaluated according to the Buchanan's Facial Image Scale.[7]

Anxiety Level	None	Mild	Mild-Moderate	Moderate	Moderate-High	Highest
Faces						

Each child was asked to point to the face that best expressed his/her feeling at that moment (very happy; happy; neutral; unhappy; and very unhappy). Right after their treatment, the children were asked to answer the same test again the impressions were taken with flavoured alginate in both the groups i.e. Group 1 And Group 2. The distraction technique was used in Group 1 and baseline anxiety and gagging was evaluated.

Statistical Analysis: We have performed Wilcoxon Signed-Rank Test and Mann Whitney test in order to determine interactive color games on the anxiety and gag reflex in the treatment group and control group.

Results: Statistical analysis showed that 28% and 76% of children from the control and treatment groups respectively had a higher level of anxiety before the use of distraction technique. However, 12% and 4% of children had higher anxiety after the use of distraction technique and, 60% and 20% of children did not show any change in anxiety levels from the control and treatment group, respectively (Table 1)

A Wilcoxon signed-rank test showed that the use of technology using interactive colored games did not elicit a statistically significant change in anxiety in the control group with existing anxiety levels ($Z = -.832$, $p = 0.405$). The median Anxiety Score rating was 2.0 both pre-and post-use of a distraction technique. However, a statistically significant change in anxiety in the treatment group with existing anxiety levels ($Z = -3.412$, $p = 0.001$) was observed.

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Mann-Whitney U test showed that the gag reflex in the control group was statistically significantly higher than the treatment group (U = 212, p =0.025).

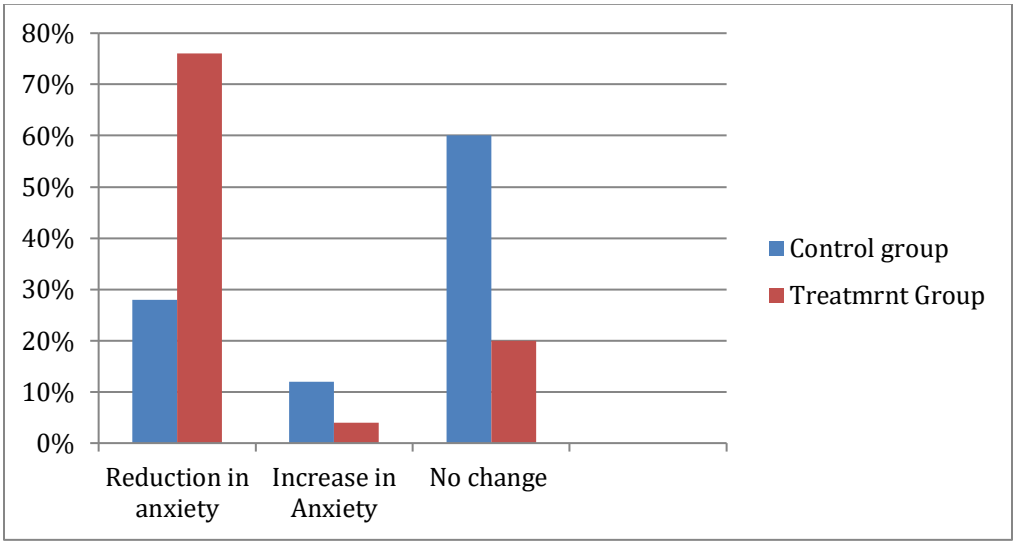

Table 1- Anxiety levels in control and treatment group (Descriptive Statistics)

Group	Time of Impression	Number of children	Mean anxiety score	Sig. (2 tailed)
Control Group	Pre-intervention/impression	50	2.94	.405
	Post-intervention/impression	50	2.92	
Treatment Group	Pre-intervention/impression	50	3.56	.001*
	Post-intervention/impression	50	2.54	

* statistically significant (p < 0.05)

Table 2: Effect of ICG on anxiety levels among the control group and treatment group.

Discussion: Gag reflex and anxiety during the dental treatment of children is a major problem in the dental clinic.[1,2] It leads to the development of dental treatment avoidance habits in children increases the risk of poor oral health. Distraction techniques were suggested to reduce the rate of dental treatment avoidance among children.[2] The present study found that the distraction technique is effective in reducing anxiety and gag reflex in children while taking an alginate impression.

Distraction is a useful technique of diverting the child's attention from what may be perceived as a discomforting dental procedure. Several techniques were developed for both visual and auditory distraction, such as background music, interactive games. These studies recommend that the use of distraction through dental treatment is valuable to patients by reducing their anxiety. Patel et al. (2006)[8] presented that children who relished playing hand-held video games had less anxiety during anesthesia induction related with the children who had only their parental existence. Similarly, Al-Khotani *et al*. (2016) demonstrated that audiovisual distraction can help decrease anxiety through a dental procedure. Prabhakar et al. (2007) showed

that audio-visual presentation and multi-sensory distraction aided in managing anxious children. However, distraction by presenting a videotaped cartoon can be unproductive in reducing uncooperative behaviour during dental treatment. () On the other hand, Sullivan et al. (2000) showed that distraction significantly reduced the pulse but did not have an effect on anxiety or behavior. ()

Anxiety has been implicated in inducing gagging in children either as a form of resistance to dental treatment or involuntarily based on previous unpleasant experiences in the dental clinic. Bassi et al. (2004) observed that there are two main categories of gagging patients based on somatogenic and psychogenic origins. However, it may be difficult to differentiate between them, as a physical stimulus may provoke gagging of psychogenic origin. Exaggerated reflex during upper arch alginate impression may obscure the procedure, and in some cases, it is intolerable to take an impression. The sensation of gagging can be distressing to children, so the information regarding its management can play an avital role in addressing a patient's mental state. We have found that the distraction technique (counting of multiple colors and geometric shapes) reduced the discomfort of alginate impression in children resulting in a reduction in gagging reflex. These results were consistent with the findings of Nuvvula et al (2015) that audiovisual distraction is a key strategy for Gag Reflux management. Singh et al. (2013) stated that behavioral techniques are the most successful long-term methods in gagging management. It reduces anxiety and helps "unlearn" the behavior that provokes gagging and these results were in accordance with our study where the distraction technique i.e. intellectual colored game that helped in reducing anxiety in children.

Buchanan's FIS (2002) is one of the tools used to measure the intensity of pain, fear, anxiety; it is a simple and valid way to measure a child's anxiety state in a dental context. This helps the clinician to plan the effective behavioral technique. Also, to assess the effectiveness of these techniques. Dickinson and Fiske (2005) proposed the Gagging Severity Index based on the results of dental procedures and was not appropriate for assessing the condition prior to commencing treatment. Therefore, they have introduced a new gagging severity index (2013) to assess the gag reflex prior to dental treatment and helps in planning treatment and management.

Conclusion: Intellectual distraction is a safe, successful& cost-effective method for gag reflux management in pediatric dentistry. The clinical effectiveness of the distraction technique also gains parent's trust as they often prefer non-pharmacological interventions. The Intellectual coloured game diverted the child's attention during the stressful alginate impression, henceforth it should be considered to further advance behaviour management techniques.

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