Case Study

Combined Effect of Oro-Motor Stimulation and Aroma Therapy for Successful Feeding in Autism Spectrum Disorder: Case Report

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Abstract

In Autism Spectrum Disorder (ASD) children feeding problems can be categorized as behavioural feeding disorders including food refusal, choking, gagging, expulsion and sensory-based feeding problems such as textural aversions. The oral stimulation increases oral motor organization improve muscle contractility as a result increases oral intake. Sensory characteristics of food such as taste, texture and aroma have effects on food acceptance. We present a case of 3.3 year old male with ASD having feeding issues such as refusal to consume food and would spit when tried to feed him forcefully and accepting only liquids in small quantities as compared to earlier since 55 days. The outcome measure used was Sensory Profile (Dunn, 1999) and Pediatric Eating Assessment Tool (PediEAT). Combined oral motor stimulation and aroma therapy was provided to the child for developing successful feeding skill.

Conclusion: From the above pilot study it may be concluded that combination of oro-motor stimulation and aroma therapy is an effective intervention in decreasing oral sensory issues and thus improving feeding skills in children with ASD.

Key Words: Aroma Therapy, Autism Spectrum Disorder, Case Report.

Introduction

Autism Spectrum Disorder (ASD) children experiences difficulties related to communication, behaviour and feeding. Latest research has shown that approximately 62% (range: 30–84%) of children with ASD may present with feeding difficulties such as increased food selectivity, unhealthy eating habits and associated mealtime related behavioural problems in comparison with other neurotypically developing peers. [1]

In children with ASD most feeding problems may be categorized as behavioral feeding disorders

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(choking, gagging, and expulsion) and sensory-based feeding problems (textural aversions to specific kinds of foods, usually involving the refusal of foods with greater texture).[2]

Mealtime behavior and eating problems are usually not assessed unless a child exhibits failure to thrive, which might explain the lack of research on problem feeding behavior in children with ASD. However, although an increasing number of research studies are targeting children with ASD, research concerned with feeding problems for this population remains unclear.[3]

Furthermore, from the literature review it has been found that many treatment strategies are being used for the children with ASD having feeding problem such as (parent intervening and ignoring, meal preparation and adaptability, play and imagination, distractions, positive reinforcements, modeling);[4] (sensory behavioral intervention, family focused intervention, modified sequential oral sensory sequenced treatment [M-SOS], multicomponent treatment [which included different techniques to address food selectivity such as sensory integration, systematic desensitization, behavior modification, positive reinforcement and escape extension], EAT-UP, BUFFET).[5]

It is a fact that the physiology of oropharyngeal mechanism is essential for developing feeding functions. The physiology of oropharyngeal mechanism depends on planned and coordinated movements of oro motor musculature such as muscle of cheek, lip, jaw, upper-lower gum, internal cheek, tongue, and soft palate.[6] It is also known that Oral motor stimulation (OMS) is the prerequisite for developing oromotor movements as it increases oral motor organization, improve muscle contractility as a result of which increases oral intake. Oral stimulation is used as an effective treatment strategy to enhance oral feeding of preterm infants with feeding problems.[7]There is inconsistent evidence of oral motor stimulation to be used for feeding problem in ASD children.

Literature has often focused upon sensory characteristics of food such as taste, texture, aroma, and appearance have distinct and influential effects on food acceptability. The sensory cues based on food aroma is extremely critical before, during and after eating. Food aroma forms a crucial sensory signal and a fundamental component of flavor perception and thus it shapes the way people experience taste and texture.[8]However, insufficient information is available on the use of food aroma for feeding issues in children with ASD.

Therefore, the rationale of this study is to find out combined effect of oro-motor stimulation and aroma therapy for successful feeding in autism spectrum disorder children.

1. Patient information **-** The child is a 3.3 year old Indian male diagnosed as ASD reported to the department of Occupational Therapy, Swami Vivekan and National Institute for Rehabilitation Training and Research, Cuttack with a chief complaint of refusal to consume food and would spit when tried to feed him forcefully and accepting only liquid in small quantities. This child was taken as a case study to find out the Combined Effect of Oro-Motor Stimulation and Aroma Therapy for Successful Feeding in Autism Spectrum Disorder. Informed consent was taken from parents of the child prior to intervention.
2. Clinical Findings –The raw score of oral sensory processing of sensory profile (Dunn, 1999) was completed and result showed that the child was having definite difference more than others and in tactile processing it was probable difference more than others. We also used Pediatric Eating Assessment Tool (PediEAT), to find out the feeding dysfunction the total score showed that the child is falling in high concern of feeding dysfunction.
3. Therapeutic Intervention – The child received a total of 60 sessions of intervention comprising of 45 minutes in an average of 5 days a week for across 17 weeks of oro motor stimulation, aroma therapy and behavior modification technique. Below are the detailed protocols of the study.

Sl. No.	No. of Sessions	Therapeutic Intervention	Child's Response
1.	First to ninth sessions	Child was exposed using various taste sensation likes a lt and sweet in liquid form.	Child was found to be uncooperative with both the taste showing temper tantrum which included hitting, biting, screaming and crying when exposed over the cheeks and lips.
2.	Tenth session onwards	Child was exposed using various taste sensation like salt and sweet in liquid form.	Child showed better adequate behaviours towards the application of the sweeter liquid i.e., honey. It was noted that he tried to lick and taste honey from the lips, thereafter we decided to put honey inside the mouth.
3.	During the 13th session.	Honey was being applied to the cheeks and the lips.	The child was pointing his finger towards his mouth, while still refusing any other taste or type of food. Child was positively reinforced.
4.	By the end of 20th session.	We explored with thicker liquids such as myonese and tomato ketch-up.	Initial few sessions with the thicker liquid similar temper tantrums was noted as discussed above.
5.	Around 29th sessions onwards.	Through, extensive trial an error of mixing the thicker liquids with various essence of (vanilla, chocolate, green apple, honey, strawberry).	We found the child to be cooperative and interested in the myonese with vanilla essence combination. Child was positively reinforced.
6.	Towards the 30th session.	We shifted to granular solids such as semolina. The viscosity of the semolina was reduced by adding 90% honey with vanilla essence, this mixture was applied through a vibratory spoon.	Accordingly it was dealt with inappropriate behaviours.
7.	From 39th session onwards.	We slowly increased the amount (20%) of semolina in the mixture after every seven consecutive sessions respectively. While adding different kinds of oral motor stimulation intervention.	Accordingly it was dealt with inappropriate behaviours.
8.	With the advent of the 50th sessions.	We gradually increased the thickness of the semolina mixture by adding "Sattu" regional delicacy prepared by mixing finely powdered almond, flat rice, cashew and walnut). One serving of semolina mix with two spoon of "Sattu" and a few drops of vanilla essence were given with vibratory spoon to the child.	Interestingly, this time the child gave positive feedback for this mixture during the feeding session. Child was positively reinforced.

9.	On 53rdsession.	Home cooked food (carrot, potato, rice) all smashed together with vanilla essence along with vibratory spoon was given.	Child responded positively.
10.	During the 57th session.	We fed the child with home cooked food without essence and vibratory spoon,	No inappropriate behaviour was noted during the session.
11.	Around 60th session.	Home cooked food was served.	Independent and social eating behaviour with peer was noted and similar likewise was reported by the parents during home feeding sessions.

Follow-up and Outcomes - At the end of 60th session sensory profile (Dunn, 1999) and PediEAT was again administered and it was found that the raw score of oral sensory and tactile processing suggests typical performance. The PediEAT subscale total score was suggestive of no concern.

Table 1: Shows pre and post scores of Sensory Profile (Dunn, 1999) and PediEAT.

Scales	Domains	Pre Score	Interpretation	Post Score	Interpretation
Sensory Profile	Oral Sensory Processing	27	Definite difference (more than others)	55	Typical Performance
	Tactile Processing	69	Probable difference (more than others)	75	Typical Performance
PediEAT	Total	212	High concern	49	No concern

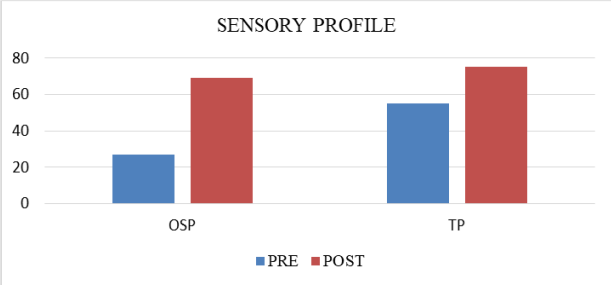

Figure 1: Graphical representation of Sensory Profile (Dunn, 1999)

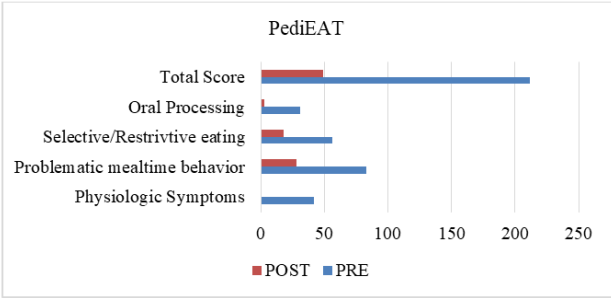

Figure 2: Graphical representation of PediEAT.

Discussion

The aroma of the food serves as a crucial sensory signal being a fundamental component of flavour perception, it shapes the child's experience taste and texture. This aroma provides an olfactory signal of edible (favorite) or inedible (non-favorite) products before the visual input of the same. The fragrance of the food stimulate salivation and enhances secretion of digestive enzyme increasing hunger and appetite. With these effects there is increase of the food products acceptability by the individual which is specifically signaled through odour. Food aromas direct the attention towards the food sources via, priming implicit memories and arouses anticipation of energy or the nutrients associated with its consumption. Retro-nasal aroma exposure has a consistent effect on the satiation and food acceptability.[8]Early oral motor interventions have been found beneficial in oral feeding of pre term infants. Recent researches displays the effectiveness of oral motor stimulation technique which accelerates the transition from tube to oral feeding in pre term infants.[9]From the above

pilot study it may be concluded that combination of oro-motor stimulation and aroma therapy is an effective intervention in decreasing oral sensory issues and thus improving feeding skills in children with Autism Spectrum Disorder.

Parent's perspective – the feeding intervention which was given to my child was very unique. Child has now stopped shouting, crying, hitting or spitting of food whenever placed in mouth. Issues such as rubbing of faces when food was in and around the mouth has decreased. Earlier the child was only preferring liquids now the child is consuming all kind and type of food. Formerly, child was very selective while eating now the child is being fed in all context.

Informed Consent – written informed consent were taken from the parents prior to the study of this case report.

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