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Role of Oromotor Therapy in Drooling Child Attending E.N.T Department

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Abstract:
Purpose: *Drooling is commonly observed in neurologically impaired children and carries a social stigma. Oromotor exercise aims at improving oral phase of deglutination by means of specific exercises for muscles of mandible, lips, tongue and palate.*
Methods: *This prospective study was carried out between May 2012 to December 2014 in Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, a tertiary care centre. 15 children with chronic drooling were taken into this study after inform consent was obtained from parents. The pre and post exercise finding were evaluated using oromotor assessment form and statistically analysed.*
Results: *The severity of drooling- pre exercise was(mean 2.60, SD 0.50) and post exercise was(mean 1.00, SD 0.00) respectively, which is significant (p value less than 0.0001). Similarly frequency of drooling pre exercise was (mean 2.67, SD 0.49) and post exercise was (mean 1.14, SD 0.36) which is significant. Respectively there was a marked improvement in tongue control, lip control, jaw control, and functional oromotor skills which is also statistically significant. (P value less than 0.0001)*
Conclusions: *Oromotor exercise plays an effective role in management of drooling child.*
Keywords: *Disability, Drooling child, Oromotor exercise, Oral sensitivity,Active exercise,Passive exercise*

I. Introduction

Drooling or silorrhoea is defined as the overflow of saliva from the mouth. Drooling (silorrhoea) most often occurs because of infrequent swallowing of saliva (secretions), and less frequently because of excess saliva production.[1,2] Moreover, these disorders may result in several health-related complications such as inadequate nutritional status and growth, reactive airway disease, and aspiration pneumonia.[3] Other children present with more mild developmental swallowing problems or oral-motor inefficiencies that may not have a negative impact on nutrition or overall health status. Although often considered less severe than other swallowing disorders, these oral motor disorders have been associated with dental malocclusion and mouth open resting posture.[4] Regardless of the aetiology or severity, disruptions in the feeding and swallowing process may result in an increased burden to the caregiver, social restriction, and diminished quality of life.[5]
It can be classified as physiological, acute and chronic.

Most normal healthy infant drool which generally declines as infancy progress.Physiological drooling will usually cease by the time child is 18 to 2 years of age.

Acute drooling occurs in many inflammatory and other diseases of mouth and pharynx.The most obvious examples of these phenomena are acute epiglottis and following tonsillectomy.The drooling in these cases is due to pain on swallowing and will disappear as soon as inflammatory reaction begins to settle.

Patients with chronic drooling are either mentally disabled, often severely so, or are afflicted with one of the various forms of congenital or acquired muscle spasticity or incoordination.In most of these cases drooling is not related to increased salivation but due to problem of inadequate disposal of normal volume of saliva.Most of these patents have postural problem affecting the head and neck,typically adopting a head hanging, open mouthed attitude, often with drooping, everted lower lip. Palpation often reveals increase muscle toneespecially in floor of mouth and lower jaw and it is this rather than weakness of the jaw closing muscles, which leads to the open mouth appearance. Barium screening or videofluroscopymay show evidence of uncoordinated activity of pharynx and upper oesophagus with resultant failure to complete second phase of swallowing.Finally in some patient there is inappropriate muscle activity such as tongue thursting.The end product of various factors is inability to clear the mouth of saliva in the normal way, so that saliva tends to collect towards the front of the mouth in a pool which constantly overflows[6].

Management of drooling can be broadly divided into surgical and conservative therapy. Conservative therapy includes pharmacological therapy,physiotherapy,aids and appliances and radiotherapy.

In physiotherapy there are two components one is oral motor therapy and other is behavioural therapy.Clinicians working with children who have feeding and swallowing problems frequently incorporate oral-motor exercises (OME) into their treatment plans.[7]There are three main categories of OME generally used in clinical practice: active exercises, passive exercises, and sensory applications.[8]

Active exercises include, but are not limited to, active range of motion, stretching, and strength training. These exercises are used to increase strength, endurance, and power through the recruitment of additional motor units as muscle fibers are enlarged.[9] Various forms of stretching affect muscle tone by manipulating the muscle spindles either to inhibit or elicit a stretch reflex. By inhibiting this reflex through slow stretching, muscle tone may be reduced. By inducing a stretch reflex through quick stretch, tone is increased.

Passive exercises may include massage, stroking, stimulation, tapping, vibration, and passive range of motion exercises in which the movement is provided with the assistance of or entirely through the clinician or caregiver with little action from the individual receiving treatment. These procedures are applied to provide sensory input, improve circulation, and preserve or enhance joint flexibility. It has been theorized that some of these techniques normalize feeding patterns by reducing abnormal oral reflexes, facilitating normal muscle tone, or desensitizing the oral region.[10]

Sensory applications comprise the application of heat, cold, electrical stimulation, high-frequency vibration, or other agents to muscle tissues. Some (e.g. cold) may be used to enhance sensory awareness to initiate a swallow response. Others (e.g. electrical stimulation) are used to strengthen the swallowing musculature.

Although these techniques are widely used by clinicians, controversy exists about the theoretical soundness and effectiveness of these interventions for individuals with swallowing disorders.[8]Much of the debate has centered on the principle of training specificity, which argues that exercises that do not mirror the targeted function (swallowing) will not be effective in changing that target function. Therefore, OMEs that address underlying impairments (e.g. strength) but do not parallel the act of swallowing may not be effective in improving swallowing skills. Another factor contributing to this debate is the lack of normative data or objective and standardized measures to assess limitations targeted by OME, such as strength, endurance, and sensation, particularly in young children. Primary deficits in oral motor function involve weakness and incoordination. These deficits are typically inferred by clinical observation, not with objective measures. Thus, it is not possible to be objective in the perceptions of weakness and subsequent changes with varied OME. Moreover, to date, there are no widely accepted normative data in infants and children to define the necessary strength required to form a bolus and produce a swallow.

Some forms of OME have been examined. However, many of the findings are from a few small studies or produced mixed results.[9, 11, 12]In addition, these studies focused primarily on adult populations. Therefore, the effects of OME on the swallowing skills of children are unclear.

Behavioural therapy aims at improvement in swallowing by making it conscious act .It uses combination of cueing,positive reinforcement,over correction and punishment.

Aim of the study:

To study effect of oromotor exercises in chronic drooling and swallowing.

II. Methods And Materials:

This prospective study was carried out between May 2012 to December 2014 in Shri Guru Ram Rai Institute of Medical and Health Sciences, Dehradun, a tertiary care centre.After obtaining informed consent from parents of 15 children's between age group 3 – 6 yrs with drooling were taken into study.7 were female and 8 were male. There were 6 cases of Cerebral palsy, 5 cases of Down's syndrome and 4 cases of mental retardation in the study [Figure 1].It was observed that all children's follow simple command and in cases of cerebral palsy head control was present. No children had any deafness, blindness, cleft lip or palate and severe mental retardation.

Procedure:

All 15 cases underwent oro motor therapy for a period of 12 weeks with 2 sessions per week. Emphasis was given for number of attempts in which child successfully completes his task rather than timing. Home exercise module was explained to the parents so that child can perform same on remaining days of week.

Oro motor exercise consisted of whistling ,candle blowing, stretching, blowing thermocol balls through straw, stroking, tapping and massaging for 5 to 10 times depending upon successful attempt.

The frequency and severity of drooling was quantified pre and post exercise using a scale as described below—

A. Severity of Drooling – Assessed using 0-3 scale

0-Dry –never drools
1-Mild- only lip wet
2-Moderate- lip and chin wet
3-Severe- soiled hand, clothing etc.

Frequency Of Drooling –Assessed using 0-3 scale

0- Never drools
1- Occasional drooling
2- Frequent drooling
3- Constant drooling.

B. Scoring for head control, jawcontrol, lipcontrol, tonguecontrol.

0-Adequate
1-Inadequate
2- Absent

C. Scoring for oral sensivity, tongue thrust and jaw thrust

0-Absent
1-Present

Statistical Analysis:

Data collected in terms of severity and frequency of drooling, jaw control,lip control,tongue control, functional oral motor skills,oral sensitivity, tongue thrust was evaluated using oromotor form and analysed using t – test formula and results tabulated pre and post exercise.

III. Discussion

In our study significant difference was seen pre and post therapy in jaw control, lip control scores following oral motor exercise which supports the facts that improve jaw and lip control reduces drooling behaviour. In this study significant difference was seen in pre and post exercise in tongue control movement. Functional swallowing scores also showed significant difference pre and post oromotor exercise. There was a significant difference in frequency and severity of drooling pre and post oromotor exercise. In a different study of eight CP patients six of whom had moderate to severe mental retardation therapy helps to reduce drooling[13]. But our study contradicts with the findings of Domaracki L .S, Sisson et al.[14] in which two patients received oral motor exercise for one hour on school days but no reduction in drooling was observed. This may be due to small number of cases.

Figure 1: Graph showing distribution of patients

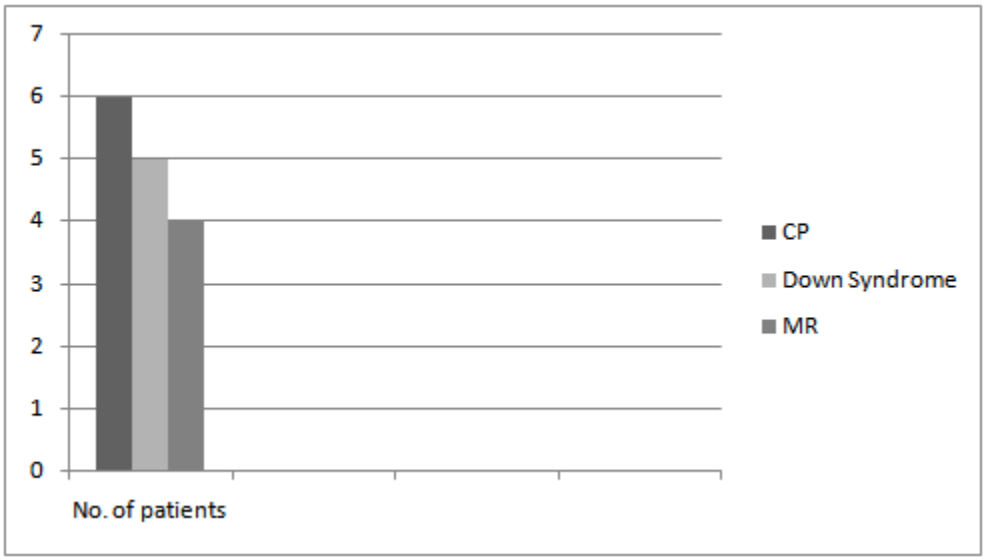

Table 1: Showing jaw and lip control score pre and post therapy

Variable	Group				Paired t –test		
	Pre -Therapy		Post -Therapy		t- value	p-value	Difference is
	Mean	SD	Mean	SD			
Jaw control close	1.73	0.46	0.50	0.52	10.67	≤ 0.0001	**Significant**
Jaw control open	1.53	0.52	0.57	0.51	9.53	≤ 0.0001	**Significant**
Lip control pursing	1.73	0.46	0.57	0.51	11.77	≤ 0.0001	**Significant**
Lip control retraction	1.47	0.52	0.43	0.51	15.00	≤ 0.0001	**Significant**
Lip control closure	1.47	0.53	0.36	0.50	8.00	≤ 0.0001	**Significant**

Table 2: Showing tongue control score between pre and post therapy.

Variable	Group				Paired t-test		
	Pre-Therapy		Post- Therapy		t-value	p-value	Difference is
	Mean	SD	Mean	SD			
Tongue control protraction	1.21	0.00	0.21	0.43	6.90	≤ 0.0001	**Significant**
Tongue control retraction	0.87	0.35	0.29	0.47	4.16	= 0.0011	**Significant**
Tongue control elevation	0.87	0.35	0.14	0.36	5.70	≤ 0.0001	**Significant**
Tongue control depression	0.73	0.46	0.14	0.36	4.83	= 0.0003	**Significant**
Tongue control to right	0.67	0.49	0.07	0.27	4.16	= 0.0011	**Significant**
Tongue control to left	0.93	0.26	0.21	0.43	5.70	≤ 0.0001	**Significant**

Table 3: Showing functional oromotor skills score pre and post therapy.

Variable	Group				Paired t-test		
	Pre-therapy		Post-therapy		t-value	p-value	Difference is
	Mean	SD	Mean	SD			
Functional oromotor skills sucking	0.87	0.35	0.29	0.47	4.16	= 0.0011	**Significant**
Functional oromotor skills chewing	0.80	0.41	0.21	0.43	4.16	= 0.0011	**Significant**
Functional oromotor skills swallowing-liquid	0.93	0.26	0.14	0.36	6.90	≤ 0.0001	**Significant**
Functional oromotor skills –solid	0.80	0.41	0.14	0.36	4.83	= 0.0003	**Significant**

Table 4: Showing drooling frequency and severity score pre and post therapy.

Variable	Group				Paired t-test		
	Pre-Therapy		Post-Therapy				
	Mean	SD	Mean	SD	t-value	p-value	Difference is
Drooling –Frequency	2.67	0.49	1.14	1.36	10.18	≤ 0.0001	**Significant**
Drooling-Severity	2.60	0.51	1.0	0.00	11.44	≤ 0.0001	**Significant**

IV. Conclusion

This study shows that oromotor exercises are effective in reducing frequency and severity of drooling in children's with special need. In this situation it is felt that speech-language pathologists will need the appropriate knowledge and skills to manage chronic drooling children and for this reason a six months trial of oromotor therapy is advocated prior to undertaking any surgical treatment.

References

[1]. Erasmus CE, VanHulst K, Rotteveel LJ, et al. drooling in cerebral palsy: hyper salivation or dysfunctional oral motor control? Dev Med Child Neurol 2009; 51: 454–9.

[2]. Sochaniwskyj A, Koheil R, Bablich K, Milner M, Kenny D. Oral motor functioning, frequency of swallowing and drooling in normal children and in children with cerebral palsy. Arch Phys Med Rehabil 1986; 67: 866–74.

[3]. Schwarz SM, Corredor J, Fisher-Medina J, Cohen J, Rabinowitz S. Diagnosis and treatment of feeding disorders in children with developmental disabilities. Pediatrics 2001; 108: 671–6.

[4]. Hale ST, Kellum GD, Richardson JF, et al. Oral motor control, posturing, and myofunctional variables in 8-year-olds. J Speech Hear Res 1992; 35: 1203–8.

[5]. American Speech-Language-Hearing Association, Dysphagia Document Review and Revision Working Group. Roles of Speech-Language Pathologists in Swallowing and Feeding Disorders. Rockville, MD: American Speech-Language-Hearing Association, 2002.

[6]. Michel J Cinnamond. The Drooling Child In: Devid Adams and Michel Cinnamond editors. Scott Brown's Otolaryngology. 6nd ed. Butterworth –Heinemann publications: 1997. pp. 6/33/1-2.

[7]. Logemann JA. Therapy for children with swallowing disorders in the educational setting. Lang Speech Hear ServSch 2000; 31: 50–5.

[8]. Clark HM. Neuromuscular treatments for speech and swallowing: a tutorial. Am J Speech Lang Pathol 2003; 12: 400–15.

[9]. Burkhead LM, Sapienza CM, Rosenbek JC. Strength-training exercise in dysphagia rehabilitation: principles, procedures, and directions for future research. Dysphagia 2007; 22: 251–65.

[10]. Ottenbacher K, Scoggins A, Wayland J. The effectiveness of a program of oral sensory-motor therapy with the severely and profoundly developmentally disabled. Occup Ther J Res 1981; 1: 147–60.

[11]. Carnaby-Mann GD, Crary MA. Examining the evidence on neuromuscular electrical stimulation for swallowing: a meta-analysis. Arch Otolaryngol Head Neck Surg 2007; 133: 564–71.
[12]. Daniels SK. Neurological Disorders Affecting Oral, Pharyngeal Swallowing. GI Motility Online 2006;
[13]. Yam WK, Yang HL, Abdullah V, Chan CY. Management of drooling for children with neurological problems in Hong Kong. Brain Dev. 2006; 28:24–9.
[14]. Domaracki LS, Sisson LA. Decreasing drooling with oral motor stimulation in children with multiple disabilities. Am J Occup Ther. 1990;44: 680–4.