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MANAGEMENT OF DROOLING IN CHILDREN WITH CEREBRAL PALSY WITH AYURVEDIC TREATMENT MODALITIES – A CASE REPORT

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ABSTRACT

Drooling occurs in about one third of children with cerebral palsy. It has been estimated that 25 to 35% of children with cerebral palsy drool to varying degrees. It is usually due to impaired swallowing because of uncoordinated tongue movements, high tonus and spastic contraction of the pharyngoesophageal sphincter, dyscoordination between the pharynx and sphincter, and a lack of coordinated control of head and neck musculature. It causes significant social handicaps and impairment in QOL of children. This can be distressing for children and their parents and caretakers. The consequences of drooling include risk of social rejection, damp and soiled clothing, unpleasant odour, irritated chapped skin, mouth infections, interference with speech and the risk of social isolation. Successful management of drooling can alleviate the associated hygienic problems, improve appearance, enhance self-esteem, and significantly reduce the nursing care time. Non-invasive methods like oral motor physiotherapy, behavioural therapy has been advocated for many decades, but results are inconsistent and time consuming. Modern medications like anti-cholinergics do not help much as they have their own side-effects. Use of other conventional methods like Botulinum toxin injections and surgical corrections are limited as they are invasive and have many aftereffects. Hence it is the need of time to bring forward treatment options with no or least side effects. Here an effort is made to reduce drooling by Ayurvedic procedures like *greevapichu*, *pratisarana* and *siro abhyanga*. The ranking of drooling was evaluated using the Drooling Rating Scale which revealed significant changes in severity and frequency of drooling after treatment.

Key words: Drooling, cerebral palsy, Greevapichu, Pratisarana, Siro abhyanga, Drooling Rating Scale

INTRODUCTION

Cerebral palsy is a non-progressive neurological disorder of movement, posture and tone due to a non-progressive pathological process in the brain caused by insult to the developing brain.[1] Despite all the progresses in new-born care, its prevalence remains at 2.25 per 1000.[2] Nearly 15- 20% of total physically handicapped children suffer from CP.

The most common presentation of cerebral palsy is delay in motor and language milestones. All types are characterised by abnormal muscle tone, reflexes, abnormal movements and postures. Associated manifestation includes intellectual disability, seizures, feeding difficulties, lack of bowel and bladder control, drooling.[3)]

Drooling/ sialorrhea is the unintentional loss of saliva and other oral contents from the mouth. It may see in healthy children and in normal development, 'salivary continence' is usually achieved by 15–18 months as control of the tongue and bulbar musculature improves. Drooling is considered abnormal over 4 years of age.[4] It is commonly observed in neurologically impaired children such as cerebral palsy, facial nerve palsy and muscular disorders like myasthenia gravis and polymyositis. In children with cerebral Palsy (CP) the prevalence can be as high as 30–53%. [5)] The increased prevalence in CP correlates with increasing functional involvement. It persists in 10- 38% of cases and 10 % of these children has embarrassing drooling. [6)]

Causes of Drooling

The common causes of drooling in children with cerebral palsy includes

- dysfunction in the oral and pharyngeal phases of swallowing
- insufficient sensory appreciation of external salivary loss
- structural or functional inability to close the lips during the oral phase of swallowing.
- uncoordinated tongue movements
- high tonus and spastic contraction of the pharyngoesophageal sphincter

Apart from the above said causes dyscoordination between the pharynx and sphincter and a lack of coordinated control of head and neck musculature results dysfunction in swallowing. Disruption of the regulatory mechanism of salivary production and inefficient tongue and/or bulbar control also contributes to drooling in these children.[7)]

Complications

It can result in significant social handicaps and can cause impairment in QOL of children. The unhygienic condition associated with a disagreeable odour and cosmetically unappealing and may lead to social isolation and rejection. Chronic drooling can lead to several clinical problems including perioral maceration and dehydration. However, it is particularly associated with significant social embarrassment and isolation, not just for the patient, but the family as a whole. It also impairs articulation resulting is speech disturbance. All this acts a barrier to education with increased dependency to the care givers, decreased self-esteem and difficult social interaction.[7]

Management

Non-invasive management includes positioning, oro-facial facilitation, speech therapy, oral prosthetics, pharmacological therapy, botulinum toxin etc and invasive methods includes surgery and radiotherapy. The use of anti-cholinergic medications have many serious side effects such as over dryness of the mouth, digestive problems, restlessness, sedation, constipation etc[8].Botulinum toxin injections are not widely preferred due to need of repeated injections to sustain its effect.[8]There are some surgical procedures which may prove effective as well, but overall have other side effects or aren't available to some types of cerebral palsy. So, there is need of the hour for research supportive effective safe treatment modalities. Therefore, this case report aimed to examine the effect of various treatment modalities in Ayurveda in the management of drooling.

CASE REPORT

A 8 year old female child who is a known case of spastic diplegia came to Kaumarabhritya outpatient wing of Govt. Ayurveda College, Thiruvananthapuram. All her motor and language

milestones were delayed along with associated complaints like severe drooling and intellectual disability.

H/O presenting illness

She is the second child of third-degree consanguineous parents, full term baby born through immediate LSCS due to reduced FHS. History of delayed cry for which immediate resuscitation done. Thereafter parents noted delayed language and motor mile stone along with ID and severe drooling.

Assessment of drooling in the child

Drooling assessment was done using Thomas-Stonell and Greenberg drooling rating score which is the sum of drooling severity scale and drooling frequency scale.[9]

Table No: 1 Thomas Stonell and Greenberg drooling rating score

Drooling severity	Points
Dry (never drools)	1
Mild (wet lips only)	2
Moderate (wet lips and chin)	3
Severe (clothing becomes damp)	4
Profuse (clothing, hands, tray, objects become wet)	5
Drooling frequency	
Never drools	1
Occasionally drools	2
Frequently drools	3
Constantly drools	4

On assessment before treatment score was before treatment score was 7 with drooling severity score as 4 and drooling frequency score as 3.

Advised management in above case is as follows.

- Total duration of procedure – 45 days
- Child was given all the routine panchakarma procedures.
- Internal medicines were prescribed according to the status of the child.
- After initial *rookshana*, *bahya* and *abhyantara sneha prayoga* was given.

Drooling was addressed with

- *GreevaPichu* (application of cotton soaked in oil) for a period of 35 days with *murivenna* along with Areca catechu juice and egg white for a duration of 30 minutes at back of the head and nape of neck. Areca catechu juice and egg white was taken in equal quantity with double amount of *murivenna*.
- *Pratisarana (*application of paste inside the oral cavity) for a period of 40 days with *kalyanaavaleha choornam* with honey and lime juice (frequently advised)
- *Siroabhyanga* (head massage) for a period of 25 days with *vatahara* tailam like *Dhanwantaram/mahamasham/maha Narayana taila*(15 -20 mints)

RESULTS

Table No: 2Pre and post assessment score

	Pre assessment score	Post assessment score
Drooling severity	4-severe (clothing becomes damp)	3-moderate (wet lips and chin)
Drooling frequency	3-frequently drools	2-occasionally drools
Drooling rating score (sum of drooling severity and drooling frequency)	7	5

The effectiveness of the treatment was assessed by comparing the scorings of drooling before and after the treatment. The drooling severity score and drooling frequency score was 4 and 3 respectively before the intervention which reduced to 3 and 2 respectively after the intervention. The difference in the score is suggestive of effectiveness of the intervention in the management of drooling in children.

DISCUSSION

Drooling is common in children with cerebral palsy for a variety of reasons and the consequences of saliva-control problems are significant and have a major impact on the quality of life for both the child or young person and their families and carers. Successful management of drooling can alleviate the associated hygiene problems, improve appearance, enhance self-esteem and significantly reduce the stress on children or young people with cerebral palsy, their siblings, parents and/or carers, as well as impacting directly on health problems.

Discussion on the probable mode of action of interventions

1.Greeva Pichu-

It has already been mentioned about the spasm of neck and head musculatures in children with cerebral palsy results in lack of coordinated control of head and neck thereby dysfunction in swallowing. *Murivenna* has k*aphapradhana tridosha hara* action may help in reducing the spasm of the musculatures of head and neck and improves swallowing.

Areca catechu holds a remarkable place in the ayurvedic therapeutic system. It alleviates *pitta kapha doshas* and it is used as a nervine tonic.[10,11]The methanolic extract of the drug was also reported to be anti-inflammatory in action.[12] Areca catechu extract topical application inhibits hyaluronidase activity and found to be an effective anti-inflammatory agent.[13]The inflammation associated with the spasm of neck and head musculatures can be addressed with the drug extract.

Egg white is an effective binding agent and is used to bind the murivenna and areca catechu extract.

Again, swallowing phase is coordinated by the swallowing centre on the medulla and pons which is the area where which the *pichu* is applied.

2.Pratisarana-

Application of *kalyanaavaleha choornam* with honey and lemon inside the oral cavity aids in voluntary movements of the tongue thereby helps in attaining a more coordinated tongue movements. It helps to remove the *stambha* over the tongue through *kapha vilayana* by its major ingredient *saindava*. It also helps in *vakpravruthi* and acts as *swarya* which acts as an additional benefit of improving the speech in children.[14] The more coordinated tongue control helps in swallowing saliva.

3.Siro abhyanga

It is the process of smearing the herbal medicated oil by specific manoeuvres & strokes on the head, neck and shoulders helping in reducing the spasm of the same. The 1st part of *Shiroabhyanga* includes right & left parietal regions and the 2nd part consists of frontal, vertex & occipital region. The voluntary initiation of swallowing involves bilateral areas of prefrontal and parietal cortices anterior to precentral gyrus in the primary motor cortex. *Abhyanga* over these areas helps in its stimulation by improving the blood circulation and thereby helps in a better coordinated swallowing.

CONCLUSION

Drooling occurs in about one third of children with cerebral palsy. Drooling associated with cerebral palsy is due to nuero-muscular dysfunction. Management of the same is difficult and all the conventional modalities are either time consuming or with serious complications. A single case report shows that Ayurvedic treatment modalities are effective in the management of drooling in children with cerebral palsy to a significant level.

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