Indian Journal of Clinical Psychology
Vol. 49, No. 4, 147-151
Case Study

Effects of Behavior Therapy on Drooling in Low Intellectual Functioning: Aversive Approach

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ABSTRACT

Hypersecretion of saliva or impairment of swallowing leads to drooling among children which carries physical and medical complications and social stigma to their families. It affects physical and mental health in a negative way. The aim of study was to see the effects of behavior therapeutic intervention program mainly using aversion therapy (pinching/inflicting pain), visual cuing and praising conducted in playful manner on drooling in a child and an adult with low intellectual functioning. Drooling Severity and Frequency Scale**,** Drooling Impact Scale**,**Teacher and Parents Rating Scale were done. The sessions were conducted twice a week, forty minutes duration for four months. Fortnightly follow-up sessions were conducted for three months. Single case study, pretest-posttest assessment design andQualitative analysis were done. Pretest assessment results showed that both the participants had profuse severity level of drooling, frequent drooling in all the settings, while playing with toys, talking with others and lack of awareness of saliva control also noticed. Informed consents were taken. Posttest assessment results revealed a drastic reduction in the frequency and quantity of drooling, enhanced self-management skill and socialization. It can be said that therapeutic programs are very effective in reducing drooling in people with low intellectual functioning.

Keywords: Aversion therapy, Drooling, Play, Behavior therapeutic intervention, Low intellectual

Introduction

Drooling is an indication of an upset in the coordinated control mechanism of Oro-facial and palato-lingual musculature leading to excessive pooling of saliva in the anterior mouth and resultant unintentional loss of saliva from the mouth (Cotton & Richardson, 1981; Blasco & Allaire, 1992). It can be seen in normal children and gradually it subsides as the child grows. However, it is considered abnormal beyond the age of 4 (Crysdale, 1989).There are many direct causes related to drooling e.g cerebral palsy, motor neurone damage, cerebrovascular accidents, parkinsonism, congenital suprabulbar palsy, major resection of the oropharynx and there are some indirect causesas well e.g nasal obstruction, tongue thrust, constant open mouth and poor lip control, hypoactive gag reflex, gastro-oesophageal reflux, head posture and sitting position, concentration on a task (Hussein et al. 1998).

Physiotherapy, biofeedback and behaviour therapy (Sochaniwskyj et al. 1987; Rapp & Bowers, 1979), pharmacotherapy (anticholinergics, scopolamine, benzotropine and glycopyrolate. Botulinum toxin) and an injection to the salivary gland have been found effective in reducing drooling (Robert, 2013). Moreover, surgery was also reported for the treatment of drooling in many cases.

Review of literature showed various treatments are available which are effective/ineffective in reduction of drooling among the person with disabilities. Crysdale et al (1985) found improvement of orofacial motor control by maintaining the head in an upright position and substituting the lost reflex by willpower-controlled swallowing. However, stimulating or brushing the oral soft tissues with chin vibration therapy was found ineffective (Domaracki & Sisson, 1990).

In Indian population and setting, Damayanti and Makati (2002) conducted a study to investigate the effect of behaviour therapy technique for controlling drooling in children with cerebral palsy with mild intellectual disability. The results of the study showed effectiveness of the token economy program in controlling drooling in children with cerebral palsy with mild intellectual disability.

Hegde and Pani (2009) studied drooling / saliva in children with cerebral palsy and its etiology, prevalence, and relationship to salivary flow rate. They found a significant relationship between ability to close the mouth and the severity of drooling. The severity of drooling was reduced with age. They found no significant difference in the mean salivary flow rate of those children who drooled and those who did not. On the other hand, oral motor stimulation intervention was found effective in drooling among children with cerebral palsy (Rekha, 2014).

Hence, several techniques and treatments were reported and no one found universally successful. The research showed complications and conflicting results as well (Blasco, 1992). However, use of aversion behaviour therapy was not reported. In this paper, aversion

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therapy in combination of visual cuing and praising has been examined in a playful manner.

Objective:

To see the effects of behaviour therapeutic intervention program based on aversion therapy, visual cuing and praising on drooling in an individual with low intellectual functioning.

METHOD

Sample and Setting: The total sample consisted of two participants (a child and an adult).

Participant 1 (child) was 4 years 6 months old with diagnosis of low intellectual functioning based on DSM criteria. On Vineland Social Maturity Scale, his I.Q was 80. He showed overall delay in developmental milestones such as speech, motor (gross and fine-motor skill) and self-help skills. On the Seguin Form Board (SFB), the child has not established form perception. He did not respond and was not able to complete even the first trial of the procedure of the testing. He was attending pre-school education in formal school. The present study was done in a clinical setting. Both parents were working and belong to upper middle-class background.

Participant 2 was an adult with moderate level of intellectual disability (mentioned on disability certificate and 75% disability). She was 21 years old, passed 10 std form NIOS (Open School) and attended Diya foundation for training in daily living skills and employability /vocational skills. She had one sibling who studied in 12 std. She belongs to a poor socio-economic status. She liked coloring activities and typing on the computer. She used to help her mother in cleaning utensils. However, she wasn't allowed to do activities e.g cooking etc. because of constant drooling. She avoids going out and meeting people. She always puts bibs on her mouth. Her mother reported that she started drooling at the age of 2 to 3 years and had speech challenges. Her parents consulted a speech pathologist for the same when she was 6 years old. She underwent oral motor exercises (blowing, swallowing etc) for drooling for a year. Her drooling had reduced a lot. However, they couldn't continue the formal therapy sessions because of financial constraints. Later she discontinued exercises at home.

She understands well and is quite expressive with familiar people. Her speech is not clear, however she tried to communicate.

Inclusion criteria: individual with intellectual disability

Exclusion criteria: individuals with Cerebral Palsy, Mental illness, Learning disability, Autism

Design:

Single- subject case study was used.

Pretest-posttest assessment design was done.

Tools

Drooling Severity and Frequency Scale (Thomas-Stonell & Greenberg, 1988) was used. The participants were assigned a rank according to the following categories of drooling severity;

1- dry: never drools; 2- mild: only the lips wet; 3- moderate: wet on the lips and chin; 4- Severe (drools to the extent that clothing becomes damp) 5- profuse: clothing, hands, tray, and objects become wet.

Frequency of drooling is also ranked as

1- never drools; 2- occasional drooling; 3- frequent drooling; 4-constant drooling*;*

Drooling Impact Scale (Reid et al 2010) was used to measure the impact of drooling. It focuses on questions related to frequency and severity of drooling as well as burden of care (number of bibs and clothing changes needed throughout the day) and its effect on children's quality of life. All items are scored on a10-point scale.

Teacher and Parents Rating Scale were done on the basis of Visual Analogue Scale i.e 10% to 100% drooling.

Techniques Used- Therapeutic intervention program was designed mainly using aversion therapy (pinching/pain) and visual cueing for creating awareness of drooling and praising the participants for successfully achieving the task.

Procedure: The sessions were conducted in a playful manner on the floor of the activity room at centre, Bangalore. These sessions were held twice a week for forty minutes duration for four months. Play activities (developmental age appropriate) were taken up accordingly. Subsequently fortnightly follow-up sessions were conducted for three months. The results of all scales served as a baseline. The entire intervention program was conducted by the same rehabilitation psychologist (registered with RCI).

The description of the therapy sessions is given in table no 1. The individual therapy notes of each participant are given in table no 2 and table no 3.

Table-1: Blue Print of Therapy Program

Sessions	Description
Session 1 to 5	Pre assessment, orientation about therapy program, written consent Rapport building and play activities,
Session 6 to 12	behaviour therapy, aversion therapy, play activities
Session 13 to 28	Continued behaviour therapy, aversion therapy and play activities
Session 29	Post assessment
Follow up session	fortnightly for three months

Table-2: Detailed Progress Report of Therapy Program (Session by Session) of Participant 1

Session	Frequency & Severity of Drooling	Aversion Therapy	Behaviour Therapy	Play Activities	Observed Positive Changes
Session 6 to 7	Three times, moderate drooling	Moderate pinching	Visual cues, praising	string beads, picture/sequential story making, peg board, marble games,	Nil
Session 8	Four times, mild drooling,	mild pinching	Visual cues, praising	story making, paper folding, puzzles	Nil
Session 9 to 10	Five times, moderate drooling,	moderate pinching	Visual cues, praising	Scissoring work, puzzles, sequential story, Form board, clay, sequential story making	Understood the concept of association between drooling and aversion
Session 11	two times, mild drooling,	mild pinching	Visual cues, praising	writing work, fine motor work, language expressive work,	Increased awareness
Session 12 to 13	six to seven times, mild drooling,	mild pinching	No Visual cues, praising	fine motor activities, memory games, social themes cards, expressive language card sequential story	
Session 14	No drooling,	no aversion	No Visual cues, praising	Social theme cards, Peg board game,	No drooling during session, Better on describing sentences/ language
Session 15	Five times, moderate drooling,	moderate pinching	No Visual cues, praising	Scissoring work, puzzles, sequential story	Child wiped his lips himself
Session 16 to 17	No drooling	no aversion	Visual cues, praising	Form board, Story/picture card, form board	No drooling, Child looked happy and more expressive
Session 18 to 19	Fourtimes, very minimal drooling,	very mild pinching	No visual cues, Praising	Cause-effect relationship puzzles, clay, Form board, social theme flash cards	Child wiped his lips himself,
Session 20	Very minimal drooling, one time,	very minimal pinching	Praising	Puzzles, fine motor activities	Improved a lot
Session 21	No drooling	no pinching	Praising	Memory game,	Better in speech, very mild drooling at home and school, Child able to frame the sentences based on questions i.e why, where, when etc
Session 22	One time, very minimal drooling,	very mild pinching	Praising on achieving desirablebehavior	Cause-effect relationship, fine motor activities,	Wiped himself without visual cues,
Session 23 to 28	No drooling,	no aversion	Praising	Form board, social theme flash cards, Peg board, string beads, matching and sorting games,	Child looked happy, Improved expressive language, Improved self-management skill, Looked confident
Session 29	Post Assessment				
Follow-up sessions	Follow-up sessions showed maintenance of the therapy program.				

Table-3: Detailed Progress Report of Therapy Program (Session by Session) of the Participant 2

Session	Frequency & Severity of Drooling	Aversion Therapy	Behaviour Therapy	Activities	Observed Positive Changes
Session 6 to 8	constant and profuse drooling	very firm pinching	Visual cues, praising on wipe and swallowing	string beads, picture/sequential story making, coloring	Nil,
Session 9 and 10	profuse constant drooling,	very firm pinching	Visual cues, praising on wipe and swallow	story making, paper folding (Orgami), puzzles	Nil, continuously saliva coming out needs reminder
Session 11	Profuse drooling,	very firm pinching	initially Visual cues, praising on wipe and swallow later she started herself wiping and swallowing saliva herself without any cue	computer typing ,	Increased self-awareness
Session 12 to 14	seven times, severe drooling,	firm pinching	initially Visual cues, praising on wipe and swallow by the therapist later participant started wiping and swallow saliva herself without any cue	computer typing, memory games,	increased self-awareness,
Session 15 to 18	five to six times moderate drooling,	moderate level of pinching	No Visual cues, praising	computer typing, reading story loudly	one drop of saliva on chin, she takes in with help of her lip movement and swallow it enhancing self-managing skills
Session 19 to 21	Five to seven times, moderate drooling,	no aversion	No Visual cues, praising	Scissoring work, puzzles, sequential story, household chores, cutting vegetables	enhancedself-awareness and self-managing while doing activities, No bib, improved peer interaction and social skills,
Session 22 to 28	very minimal drooling	no aversion	No visual cues, praising	watching T.V, computer typing, cutting vegetables, cooking activity e.g preparing maggiee and tea etc	participant wiped herself, Enhance self-awareness and self-managing while doing such activities, looked happy and confident, enhanced expressive language, reduced avoidance for attending social group
Session 29	Post Assessment				
Follow-up sessions	Follow-up sessions showed maintenance of the therapy program.				

Analysis: Qualitative analysis was done.

Results: The results of the study were as follows

Scales	Pre-test Assessment Score	Post-test Assessment Scores
Drooling Severity and Frequency Scale	**Participant 1:** 8 profuse: clothing, hands, tray, and objects become wet. frequent drooling **Participant 2:** 8 profuse: clothing, hands, tray, and objects become wet. constant drooling	**Participant 1**: 4mild: only the lips wet, 2 occasional drooling **Participant 2**: 2 mild: only the lips wet, sometimes no drooling
Teacher and Parents Rating Scale on Visual Analogue Scale	**Participant 1:** 90% drooling Not socialize, peer group does not take initiative to interact with him **Participant 2:** 100% drooling we (parents) didn't allow to do cooking and other activities because of constant drooling, getting angry easily, stubbornness, lazy,	**Participant 1:** 20% drooling Looked happy, increased interaction with peer group, other children come forward to interact with him **Participant 2:** 25% drooling, Enhanced self-managing, didn't need any reminder, most of the time mouth is closed, very less drooling while doing activities at home and social setting, improved sibling interaction and cooperation
Drooling Impact Scale	**Participant 1 and 2:** Moderate skin irritation, All the time participant's mouth needed wiping (reminder to be given), Embarrassment, Wipe or clean saliva from household items, e.g. toys, furniture, computers all the time Drooling affected their life greatly Affected family's life-moderately	**Participant 1 and 2:** Mild skin irritation, Increased awareness and socialization felt happy, improved self-image Enhanced self-management skills, Enhanced peer interaction and peers came forward to interact with them, Parents felt happy

DISCUSSION

Post intervention results showed enhancement in the participant's self-esteem, confidence level, socialization and self - management skill. Moreover, there was reduction in severity and frequency of drooling in both participants. Intervention brought positive changes in the individuals' awareness, perception, skills, and attitude towards them by the people who were around them (society). They didn't feel isolated and felt alone because of better management of drooling. They were part of social groups and activities. Other studies also found improvement in awareness and self-esteem by other methods of intervention. Harris and Dignam (1980) used sucking and blowing games with straws and candles by increasing awareness of their tongues over a year period. They found 73% reduction in the volume of saliva drooled. Moreover, quality of life was improved among them.

Vanderburg et al (2001) conducted a study to find out the relationship between drooling and quality of life of children and their parents. These children experience problems with social interaction, neglect and low self-esteem. They found improvement in the physical appearance, socialization and acceptance of the child. Therefore, effective management of drooling could reduce the frequency of wiping the child's mouth, changing bibs and damage to electronic devices thereby making the quality of life of parents and child better.

The present study was conducted on the small sample size and short length of the follow up sessions. Hence, generalization of the study would be difficult. However, the research showed sound results by using unique intervention method and having positive implications in the field of disability and rehabilitation of an individual. It indicates that self-awareness is pivotal and foremost skills to bring positive changes in reducing drooling, enhancing self-determination and interpersonal skills at any age. Playful atmosphere is another important component to bring changes in the person's attitude where the person feels comfortable and relaxed even when facing to the unfavourable conditions.

Conclusion:

Thus, it can be said that behaviour therapeutic intervention programs based on mainly aversion therapy, visual cuing and praising techniques in playful manner on drooling are effective in the person with low intellectual functioning.

Postscript:

After 3 years, Participant 1 (child) had been seen for poor academic performance and learning problems at the clinic. Later the child consulted again for psychosocial training when he was 11 years old. Maintenance of positive changes of therapy programs was noticed.

Participant 2 (an adult) was seen after 2 years (post covid-19). It was noticed that she has started profuse drooling and wears bibs on her mouth constantly.

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Letter to Editor

Factors of Stress amongst Mothers of Children with Cerebral Palsy (CP) in India

Dear Editor,

Cerebral palsy (CP) is a disorder of childhood which pervasively affects children's physical movements and postures. Incidence of CP is about 2-3 in every 1000 live births. In Indian traditional families the mothers have to take care of routine household activities, children and their needs. Thus, the mothers of children with Cerebral Palsy are also at more risk to develop stress and other psychological issues because of the prolonged commitments in child rearing, as per his/her needs and demands. Author reviewed research to look into the various factors involved in precipitating and sustaining stress in the mothers of children with Cerebral Palsy. Available details through this review may help professionals, service providers, stakeholders and policy makers to dig into the functional condition of the mothers. To provide the right intervention, required social and financial support to improve mental physical health and quality of life of mothers in a developing country like India.

The important factors associated with mother's stress were reported to be socio-demographic mostly financial burden of care for the child, various burdens, which follows: main disease burden of care i.e. personal -psychological, interpersonal - family, social - community, involved environment, government facilities, policies, mother's knowledge and awareness about child's illness.

This review is indicative of the fact that there is a need for generation of awareness about this childhood disorder in the community to help the caregivers and minimize the disease burden.

Thanks

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