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Case Report

Ayurvedic management of Autism Spectrum Disorder with sensory processing abnormalities – A case report

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ABSTRACT:

Introduction: Autism spectrum disorder (ASD) is characterized by impaired social interaction, communication, with restricted and repetitive behavior. 69%–95% of Autistic children present with sensory abnormalities. Sensory abnormalities requiring interventions include auditory (43.5%), visual (27%), proprioception (43.5%), touch (20%), taste/smell (43.5%), and movement (27%). Features of autism compared to *Unmada* resulting from vitiated *dosha* affecting *Hridaya* and *Manas.* Here we bring a single case report on ASD managed with Ayurveda procedure-based therapy and oral administration of *Swarnaprashana.* **Materials and methods:** A single case of ASD was treated and documented for changes in clinical manifestations of ASD, improved socialization and performance on Indian Scale for Assessment of Autism, Short Sensory Profile, Parent Rated 10-items likert scale and children global assessment score and discussed. A 5-year-old male child was presented with delayed response, poor eye contact, aggressiveness, language delay, hyperactivity, absent social smile, hand flapping, sensory issues of tactile, taste, smell, auditory filtering and sensory seeking. The condition was analyzed based on Ayurveda principles to arrive at conclusion as *Unmada.* He was treated with *Udgarshana* , *Sarvanga Parisheka*, *Matrabasti* for a period of 10 days in 3 sittings with 20 days gap and minor procedures aiding sensory stimulation like *Pratimarsha Nasya*, *Dhupana*, *Asya Prathisarana*, *Karna Pichu*, *Guru Pravarana*, Ragi *Samvahana* and vision stimulation activities carried out for 90 days along with *swarnaprashana* 4 drops orally. **Results:** Evaluation after 90 days of treatment showed reduction in features from moderate to mild category on autism rating scales and PRILS-10. The child was calm, performing better and did not have any regression during the one month follow up period. **Discussion:** A single case of ASD was effectively managed through Ayurveda principles to reduce the difficulties in socialization, cognitive domains and sensory processing abnormalities. The therapy was well tolerated, safe and efficacious without any adverse events.

KEYWORDS: Ayurveda, Autism, CGAS, ISAA, Short Sensory Profile, Sensory processing abnormalities, Indriyatarpana, Case report

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1. INTRODUCTION

Autism spectrum disorder (ASD) is an early onset neurobiological disorder, characterized by qualitative impairments in social interaction and communication skills, along with unusual stereotypic, restrictive, and repetitive behaviours. [1] The World Health Organization (WHO) estimates the international prevalence of ASD at 0.76%, which accounts for approximately 16% of the global child population [2] while in India, it is about 1 to 1.5% amongst 2 to 9 years old children. [3] ASD manifests around 18-24 months of age and is well established by the age of 3 years with boys affected more than girls (4:1 to 3:1). The presence of sensory abnormalities in ASD was first identified in 1943 by Kanner. [4] Currently 69%–95% ASD children have sensory processing abnormalities. [5] Majority of them requiring interventions include auditory (43.5%), visual (27%), proprioception (43.5%), touch (20%), taste/smell (43.5%), and movement (27%). [6] The neurobiological basis for these sensory abnormalities is not clear and also the pathophysiology. [7, 8] When present, they cause chaos, impaired quality of life, social participation and cause distress to family members. Many of these manifestations are correlated to that of *Unmada* in Ayurveda. Certain specific pre-conceptional and antenatal factors that influence a child's psychological development are described. *Unmada* refers to *Vibhrama* of *Mana* (mind), *Bhuddhi* (intellect), *Sanjna* (consciousness), *Jnana* (knowledge), *Smrithi* (memory), *Bhakthi* (desires), *Sheela* (manners), *Cheshta* (behaviour) and *Achara* (conduct). Factors that aggravate the *Dosha* in upper channels further afflict the abode of intellect i.e. *Hridaya and Manas* and they in-turn instantaneously infactuate the mind. [9] Considering these core ideas and *agni dushti* as primary cause, an Ayurveda protocol was designed. This manuscript highlights management of a single case of ASD through Ayurveda principles.

2. MATERIALS AND METHODS:

Case Introduction

A five-year-old male child was brought to the OPD of *Kaumarabhritya* department, SDMIAH Bangalore, with concerns of delayed responses to commands, poor eye contact, and delayed speech development. Additionally, he displayed hyperactivity, absence of social smile, repetitive movements such as hand flapping and jumping, showed distress during grooming, preference for eating specific textured food, making unusual noise, closing ears to high pitched sounds and visual stimming noticed since the age of 2 years. Child was first born to a non-consanguineous parent of upper middle class, living in a nuclear family at urban residency.

History of presenting illness

The child was apparently normal at birth with normal motor development except for mild hyperactivity. However, failed to attain social and language milestones even by 2 years of age and had poor name call response, repetitive hand movements, jumping and aggressiveness. This led to occupational therapy consultation without formal assessment. Therapy was done for one year and minimal control of hyperactivity seen. Due to continued concerns, child was brought for Ayurveda management.

There was no significant information about past illness or family history of genetic illness, intellectual disability, speech delay and psychological illness.

Prenatal, natal and post-natal history

Mother conceived at the age of 29 years, had regular Antenatal checkups and took Iron, Folic acid and calcium supplements as suggested. However, there was history of family stress, anxiety and fear throughout pregnancy. She was suspected of Pancreatitis in the third trimester, but was not treated. There was no history of Gestational Diabetes, Hypertension, Eclampsia. Child was delivered through LSCS weighing 4000g, cried at birth but later developed Respiratory distress requiring NICU admission for 5 days.

Child was completely formula fed till 6 months followed by home based complementary food and immunized as per age. Presently child is fed with soft mashed mixed diet predominant of chicken, cooked rice and pulses, chapathi, chocolates, nuts and milk. He refuses crunchy, rough, hard and liquid consistency. Child demands frequent meals, is constipated, passes hard bowel on alternate days. Micturition and sleep adequate. He is habituated to thumbsucking and no allergies identified.

Current status of development:

At present, child has no social smile, eye contact and name call response or meaningful speech and does not follow commands but keeps making abnormal noises frequently (jargon).

General examination

The child has no physical deficit, normally nourished but irritable, hyperactive with social and communication deficits including pointing and gestures.

Ashtasthana Pareeksha

- *Nadi – Vatapittaja*
- *Mutra – Prakrita*
- *Mala – Grathita*
- *Jihwa – Aliptha*
- *Shabdha – Vikruta* (sensitive to high pitched sound and no meaningful speech)
- *Sparsha – Ushna sparsha* with Tactile sensory issues
- *Dhrik – Vaikruta* (visual sensory issues)
- *Akruti – Prakruta*

Dashavidha Pareeksha

- *Prakruti – Kaphavataja*
- *Vikruti – Vatapitta pradhana*
- *Sara – Madhyama*
- *Samhanana – Madhyama*
- *Satmya – Avara*
- *Satva – Avara*
- *Ahara shakti – Pravara*
- *Vyayama shakti – Pravara*
- *Vaya – Balya*

Srotopareeksha

Rasavaha srotas – ashraddha, tama pravesha

Manovaha srotas - dhi vibhrama, satva pariplava, paryakula drishti adhiratha, abaddha vakyatwam, hrudayam cha sunyam, sa muda na sukham na dhukam na achara dharmo

Systemic examination

Respiratory, cardio-vascular, gastrointestinal, urinogenital and musculo-skeletal examination findings showed no abnormalities. On Central Nervous System examination child was conscious with subnormal

orientation, inattentive, well-groomed and had poor eye contact and response. Inefficient in both verbal and non-verbal communication. Affect labile. Examination of Cranial Nerves, Motor system, Reflexes and gait were normal.

Investigations and Assessments

The child was evaluated and found to meet the DSM 5 (Diagnostic and Statistical Manual) criteria for ASD and scored 7 on MCHAT (Modified Checklist for Assessment of Autism in Toddlers) suggesting risk of ASD. Diagnostic assessment with ISAA (Indian Scale for Assessment of Autism) was 144 indicating moderate autism. Short Sensory Profile score was suggestive of higher sensitivity. On CGAS (children Global Assessment Scale) child scored 25 indicating inability to function independently in all areas, requiring considerable supervision. PRILS-10 (Parent Rated 10-items likert scale) [10] assessment suggested severe sensory processing issues.

Diagnosis

Vatapittaja Unmada (Autism spectrum disorder with Sensory Processing Abnormalities)

Treatment

Customarily as an initial step to correct *Agni*, child was given *Ajamoda Arka* 5ml thrice daily with buttermilk and *Bilwadi Gutika* 1 tablet twice daily before food with water for 1 week. Following which irritability and constipation was reduced.

Table 1: In-patient treatment plan

Timeline : 1st sitting - 04/05/2024 – 13/05/2024 2nd sitting - 03/06/2024 – 12/06/2024 3rd sitting - 03/07/2024 – 12/07/2024 Following procedures were done for 10 days in 3 sittings with an interval of 20 days in between.				
Sl. No	Procedure	Medicine	Quantity per day	Duration
1.	*Sarvanga Udgarshana*	*Siddharthaka snana churna*	150g	20 minutes
2.	*Sarvanga Parisheka*	*Dashamoola Kashaya*	5litres	15 minutes
3.	*Matra Basti*	*Kalyanaka ghritha*	30ml	NA
4.	Oral Administration	*Swarnaprashana*	4 drops	90 days

Table 2: Home Based Therapies for 90 days

Home based therapies were carried out throughout 90 days	
Tactile and proprioception	*Guru Pravarana* and Ragi *Samvahana*
Auditory	*Karna Abhyanga* and *Pichu* with *Bhandhana*
Oral sensory	*Asya Prathisarana* with *Vacha Churna* mixed with honey and *Ghritha*
Olfactory	*Dhoopana* with *Aparajita Dhooma* and *Pratimarsha Nasya* with *Kalyanaka Ghrita* 2drops each nostril once daily
Vision	Candle light, torch light and color light stimulation

Table 3: Changes observed through the course of treatment

Baseline	After 1st sitting	After 2nd sitting	After 3rd sitting	Follow up
• Hypercactivity and restlessness • Disturbed sleep • Aggressiveness • Poor eye contact and reduced social interaction • Sensory issues	• Constipation relieved • Improved sleep quality • Aggressiveness mildly reduced	• Hyperactivity mildly reduced • Sitting tolerance, improved • Able to eat different texture food	• Improved eye contact • Started socialization • Tactile sensory issues improved	• Able to initiate conversation • Auditory sensory issues improved • Eye contact better • Sitting tolerance better

Treatment compliance and adverse events: Child tolerated the therapy well and adverse drug reactions (ADR) were none.

3. RESULTS

Following 90 days of intervention significant improvement were noted and are summarized below.

Table 4: ISAA scores before and after treatment

Domains	On 0 day (BT)	On 90th day (AT)
Social relationship	34	22
Emotional responsiveness	21	12
Speech language and communication	24	16
Behavioral pattern	30	17
Sensory aspects	19	11
Cognitive component	16	13
Total score	144 (Moderate)	91 (Mild)

Table 5: Short Sensory profile scores

Item	BT	After 90 days
Tactil sensitivity	26 (PD)	33 (TP)
Taste/Smell sensitivity	12 (PD)	17 (TP)
Movement sensitivity	12 (PD)	12 (PD)
Under responsiveness / Seeks Sensation	15 (DD)	24 (PD)
Auditory Filtering	11 (DD)	21 (PD)
Low Energy/ Weak	30 (TP)	30 (TP)
Visual/ Auditory Sensitivity	14 (DD)	18 (PD)
Total	120 (DD)	155 (TP)

*PD- Probable difference, DD- Definite difference, TP- Typical performance

The child initially had definite difference indicating severe sensory issues which was changed to typical performance suggestive of reduction in sensory processing abnormalities.

Table 6: Changes in assessment scale

Assessment Scale	BT	AT
CGAS	25	50
PRILS -10	45/50	39/50

4. DISCUSSION

Autism is a neurobehavioural condition presenting with deficits in socialisation and communication. Sensory deficits is seen in 90% of ASD.[11] ASD equated with spectrum of *Unmada* due to alterations in *Manas,*

Buddhi, Sanjna, *Jnana*, *Smrithi*, *Bhakthi*, *Sheela*, *Cheshta* and *Achara*. Intricate connection of mind with digestion leads to features of *agni dushti* (altered bowel habits) in ASD that further leads to imbalance in neurotransmitters implying the pathophysiology behind sensory and behavioural issues. Thus here, *Ajamoda arka* corrects *agni* by its *laghu, ushna, teekshna* qualities. *Arka* is better absorbed and less irritant to sensitive gut. *Bilwadi gutika* used with concept of treating *garavisha* (endotoxins) and *takra* aids in restoring gut microbiome. [12] *Swarnaprashana* is the colloidal mixture of calcined gold with clarified butter and honey having multi-modal activity. [13] *Kalyanaka ghrita* used as the base in *Swarnaprashana* is specific to *Unmada chikitsa* [14] besides being *medhya, tridoshashamaka* and *agnivardhaka*. Gold as calcined ash is excellent neurotonic and immunomodulator. Honey enhances palatability, act as a catalyst. *Udgarshana* (rubbing of body with medicinal paste opposite to hairline) aids in sensory stimulation of vitiated *Vayu* that impedes *jnanotpatti*. *Siddharthaka snanachurna* is *rakshoghna. Sarvanga parisheka* with *Dashamoola Kashaya,* is rhythmic dropping of medicated decoction on the body. It is *vatahara* and stimulates the peripheral nerve endings and provides sensory inputs to the brain. *Kalyanaka ghrita* retentive enema has slow absorption of the contents and is *medhya, balya, pachana* and *rasayana. Karna pichu* and *bandhana* is *vatahara* and corrects *vata* at *indriya sthana. Gurupravarana* is a type of *niragni sweda* aids in removing *srotorodha* and restores *vata* movement. *Vacha churna* is *medhya, vakpravartana*, *apasmarahara*. *Asya pratisarana* with this stimulates the local tissues and aids in both motor and sensory stimulation of *Vak indriya*. Ragi *samvahana* (gentle pressure massage), induces *nidra,* does *indriya prasadana* and relaxes mind. Vision stimulation activities like candle gazing aid in eye fixation, improves focus and removes visual stimming. *Dhupana* with *aparajita dhuma* stimulates olfactory sensation. *Pratimarsha nasya* (nasal medication) does *tarpana* of *shringataka marma,* the *adhishtana* of all the senses and aids in proper *indriyartha sannikarsha*. Overall, these would aid in *indriyatarpana* and *indriyaprasadana*.

5. CONCLUSION

A child with ASD with varying degrees of functional and sensory processing difficulty was managed with procedure based ayurveda therapy along with oral administration of *Swarnaprashana*. The child showed significant improvement in clinically and performed better on ISAA, Short Sensory Profile, CGAS and PRILS-10 Scoring of autism following 90 days of treatment. Thus, present treatment protocol consisting of *Pachana, Rookshana, Indriya tarpana* and *Medhya rasayana* in ASD gives a promising hope for management without any documented ADR. Continual and long-term intervention would prove to be much more beneficial. However prospective case series and randomized controlled trials are needed to establish their proven efficacy. Child was prescribed *Medhya rasayana* after completion of therapy and followed up for one month, during which the child was stable and performed well in the school as per parental report.

Abbreviations:

ASD – Autism Spectrum Disorder

DSM - Diagnostic and Statistical Manual

MCHAT - Modified Checklist for Assessment of Autism in Toddlers

ISAA - Indian Scale for Assessment of Autism

CGAS - Children Global Assessment Scale

PRILS-10 - Parent Rated 10-items likert scale

ADR – Adverse drug reaction

PD- Probable difference

DD- Definite difference

TP- Typical performance

Declaration of Patient Consent – The authors confirm that they have acquired a patient consent form, in which the patient or caregiver has granted permission for the publication of the case, including accompanying images and other clinical details, in the journal. The patient or caregiver acknowledges that their name and initials will not be disclosed, and sincere attempts will be undertaken to safeguard their identity. However, complete anonymity cannot be assured.

Patient perspective - Parents stated that "Our son was previously not able to respond to any commands, too easily distracted, getting irritated and angry for little things and required continuous supervision. Following ayurveda treatment there is significant improvements in his behaviour, eye contact and cognition".

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