

## Exploring ayurvedic management of autism spectrum disorder: A case report

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### ABSTRACT

Autism Spectrum Disorder is one of the main concerns of paediatrics in the present era. ASD is a neurodevelopmental disorder that affects how to interact with others, communicate, learn and behave.

In Ayurveda, ASD is not defined as a single disease. On the basis of similarity in symptoms the term ASD can be correlated with imbalance in the form of *Bhramsha* (aberration) of *Dhee*, *Dhriti* or *Smriti*, either collectively or singularly due to indulgence in unwholesome action, termed as *Pragyaparadha*. Its majority of clinical features resembles with *Unmada*. The conjunction between *Atma* (the self) and *Manas* (mind) is disrupted resulting in the vitiation of *Manovaha srotas* (channels of consciousness that flow through mind) followed by the vitiation of three *doshas* (*Vata*, *Pitta*, and *Kapha*) will end up in the manifestation of *Unmada*. *Manovaha srotodushti* together with *Tridosha dusti* is the basic cause of ASD.

A 7 years old female child was presented with the complaints of delayed speech, struggle with eye contact, hand flapping, lining up toys, rigid routines, over sensitivity to sounds, poor memory, toe walking, high anxiety, self-harm, hyperactivity and constipation.

Ayurvedic treatment consisting primarily of *Tridosha hara chikitsa* (treatment for pacifying *Vata*, *Pitta* and *Kapha*) along with *Deepana-Pachana* (drugs for enhancing digestive power), *Mridu Shodhana* with *Snehan* (External application of oil), *Swedan* (bath with hot water), *Nasya* (nasal instillation of ghrita), *Matra Basti* (medicated oil enema), *Shaman* with *Medhya Kalpana* (drugs for promoting intellectual and cognitive functions) and *Pathya krama* (congenial diet and habits) resulted in considerable relief of the condition.

**KEYWORDS:** Autism Spectrum Disorder, Neurodevelopmental disorder, *Manovaha Srotodushti*, *Unmada*, *Pragyaparadh*.

## INTRODUCTION

COVID pandemic had a significant and multifaceted impact on child's social, behavioral and emotional skills. Latest survey by Autism and Developmental Disabilities Monitoring (ADDM) Network of Centre for Disease Control and Prevention (CDC) suggest about 1 in 31 (3.2%) children ages 8 years has been identified with ASD [1]. These statistics calls for the urgency of evaluating this condition in scientific backgrounds.

Challenging behaviours and emotional difficulties are more likely to be recognized as “problems” rather than “disorders” during the first 2 years of life [2].

ASD is a neurodevelopmental disorder which is characterized by impaired social communication, interaction, stereotypic behavior and restricted interests. Signs and symptoms of Autism are still unclear. ASD is a syndrome which manifests during early childhood.[3]

In *Ayurveda* classics, there is no description of exact clinical condition which resembles with ASD. Hence, ASD can be classified as an *Anukta Vyadhi* as per *Ayurveda* principles and on the basis of its pathophysiology, management can be made based upon involvement of *Dosha, Dushya, Dhatu, Mala, Agni, Srotas, Adhishthana, Nidana panchaka, Doshaja* and *Manasa Prakriti, Rogi* and *Roga Pareeksha*.

Despite that, Clinical features of ASD found resemblance with the disease entity *Unmada* mentioned in all the major *Ayurveda* classics. Clinically it is defined as a behavioural syndrome. *Ayurveda* has viewed ASD as a behavioural abnormality with its roots located in the defective neuropsychological systems which have lifelong effect on physical, mental and social development of a child.

*Ayurveda* systems of medicine possess wealth of herbal formulations and *Panchakarma* procedures that can

efficiently address the escalating prevalence of ASD. Adopting *Unmada chikitsa* is very pacifying in the management, which can target the higher centre of brain in order to manage the core features of ASD. This case study is only an example of ASD case where remarkable improvement was found in the condition by adopting Ayurvedic management, especially with *Mridu-shodhana chikitsa* (purificatory therapies) and *Shamana chikitsa* (treatment methods for pacification of diseases).

## CASE REPORT:

### HISTORY:

A 7 years old female child was presented with the following complaints:

delayed speech, struggling with eye contact, hand flapping, lining up toys, rigid routines, over sensitivity to sounds, poor memory, toe walking, high anxiety, self-harm, hyperactivity and constipation. She was Hindu by religion and was the first child born to a middle class, literate, non-consanguineous parents.

### HISTORY OF PRESENT ILLNESS

The parents were struggling to conceive and after three years they conceived this child. The age of mother and father at the time of gestation was 26 and 33 years respectively. Blood group of mother, father and child was AB+ve, O+ve and AB+ve respectively. Because of fetal distress, LSCS was done at Full-term. The baby cried soon after birth, and birth weight was 2.8 Kg. The mother and baby were discharged from hospital on the third day after delivery. No other relevant post-natal events were reported. As months passed away, parents observed child's poor developmental milestones. She started to crawl at the age of one year and started walking and uttering her first word at two years. Parents approached a hospital at the age of three and half year and was diagnosed as

having ASD. The child was identified to have poor IQ level and so was admitted to a special education unit.

### **HISTORY OF PAST ILLNESS**

The child had complaint of constipation more frequently up to the age of five years.

### **DEVELOPMENTAL HISTORY**

Delay in Gross motor, Fine motor, and Social and Language skills were noted.

- **Gross motor:**

Child achieved head control at the age of 10 months. Started crawling at 12<sup>th</sup> month. And at the age of two years, she started to walk without support.

- **Fine motor:**

Child have attained Grasping skill. But, Self-feeding, Buttoning, drawing skills are not attained.

- **Social milestones:**

The child attained to respond to her name, also indicated what she wants. But social smile and unassisted dressing were not attained. She was dry by day but not attained dry by night.

- **Language:**

Child attained to say Dada, Mummy at two and half years of age. Small sentences and storytelling were not attained

### **IMMUNIZATION HISTORY**

The child was immunized in Government Hospital as per schedule

### **DIETETIC HISTORY**

The child was exclusively breastfed up to six Months. Weaning started at sixth month and was breastfed till two years of age. Presently the child takes lots of packet food and sweet beverages. Also having regular foods including grains, rice, pulses etc.

### **FAMILY HISTORY**

There was no relevant history of family.

### **PERSONAL HISTORY**

Diet was vegetarian and child has moderate appetite. Child frequently passage hard stool. Micturition was normal. But toilet training was not attained and so has complaints of soiling of pants at night. Sleep was sound. The child had a habit of hand flapping, lining up the things and walking on the toes. Allergies of any kind was not reported.

### **EXAMINATION**

The child was struggling with eye contact, have delayed speech, was flapping her hands, always try to lining up toys and other things. She has very rigid routine. She was over sensitivity to sounds with high anxiety and aggressive attitude. She has poor memory. Vital signs and Anthropometry were within normal limits.

#### **Head to foot Examination**

The head-shape and size appeared normal. The Fontanelles were closed by 18<sup>th</sup> months, and were non-pulsatile and normal. Facial morphism was normal, Dentition was normal. Neck, Skin, Limbs, Chest, Spine, Abdomen and Genitalia were normal.

#### **Systemic Examination**

No abnormalities were detected in examinations of Respiratory, Cardio Vascular, Gastro Intestinal and Urinary System. CNS was affected in the domain of Higher Mental Functions of the child. Appearance and behavior were noted as Aggressive, Hyperactive and Inattentive. Flapping her hands repeatedly, have poor socialization and communication. The child was conscious with unoriented to time and place. A deficiency was noted in memory and Intelligence. Impairment in both verbal and non-verbal communication was noted.

### **INVESTIGATIONS**

Vision and Hearing tests were Normal

### **ASSESSMENTS:**

Specific assessment tools used for assessment of Autism:

# 1. Childhood Autism Rating Scale (CARS)

The CARS is used by clinicians to help determine the children who meet criteria for ASD from those who meet criteria for other developmental delays. The scale is a fifteen-item questionnaire that asks about relationships, imitative behavior, emotional responses, ability to adapt to change, use of the senses and sensitivity to foods, sounds, objects, intellectual response, verbal communication, and activity level [4]

# 2. Autism Treatment Evaluation Checklist score (ATEC)-

ATEC is a one-page form designed to be completed by

parents, teachers, or caretakers. It consists of 4 subscales. Questions in the first three subscales are scored using a 0–2 scale while fourth is scored using a 0–3 point scale. Total Score, which ranges 0–179 points [5].

## DIAGNOSIS

The clinical condition was diagnosed as moderate ASD.

## TREATMENT DONE

Seven years old female child was undergone with the following treatment for 3 months.

**Table No. 1: Treatment Protocol of Patient**

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Phase I (for 7 days)		
<ul style="list-style-type: none"><li>• <i>Deepana-pachana</i> (drugs for enhancing digestive power)</li></ul>	1gram of <i>Trikatu Choorna</i> in two divided dose half hours before meal	
Phase II ( for 15 days)		
<i>Mridu Shodhana</i>		
1.	<i>Snehan</i> (External application of oil)	<i>Ksheerbala Taila</i> (100 ml) for 30 minutes applied on whole body followed with gentle massage on scalp
2.	<i>Swedan</i> (bath with hot water)	Bath with hot water
3.	<i>Nasya</i> (nasal instillation of oil)	nasal instillation of 2 drops of <i>Dhanvantaram Taila</i> in each nostril with the help of an instiller
4.	<i>Matra Basti</i> (medicated oil enema)	Enema of 30 ml of <i>Ksheerbala Taila</i>
Phase III ( for 3 months)		
<i>Shaman</i> (treatment for pacifying <i>Vata</i> , <i>Pitta</i> and <i>Kapha</i> )		
1.	<i>Ghrita</i> (drugs for promoting intellectual and cognitive functions)	<i>Abhaya Ghrita</i> 7ml/day was given in two divided dosage once in the morning on empty stomach ( <i>Pratah kala</i> ) and once again in the evening before dinner ( <i>Prag Bhukta kala</i> ).
2.	<i>Vati</i> (drugs for promoting intellectual and cognitive functions))	<i>Manasamitra-vatakam</i> one tablet was given at bedtime with boiled and cooled water.
<i>Pathya</i> and <i>Apathya</i> (wholesome and unwholesome diet)		
1.	<i>Pathya</i>	<i>Medhya</i> (that which promotes memory and intellect),

		<i>Hridya</i> (that which is good for mind), <i>Brumhana</i> (that which is nourishing), <i>Ghrita</i> (ghee), <i>Madhu</i> (honey), <i>Yava</i> ( <i>Hordeum vulgare</i> ), <i>Dadima phala</i> (pomegranate fruit), <i>Amra phala</i> (mango fruit), etc.
2.	<i>Apathya</i>	<i>Mamsa</i> (meat), <i>Rooksha</i> (dry), <i>Katu</i> (pungent taste), <i>Ushna</i> (hot in potency), <i>Vidahi</i> (that which creates burning sensation), etc.

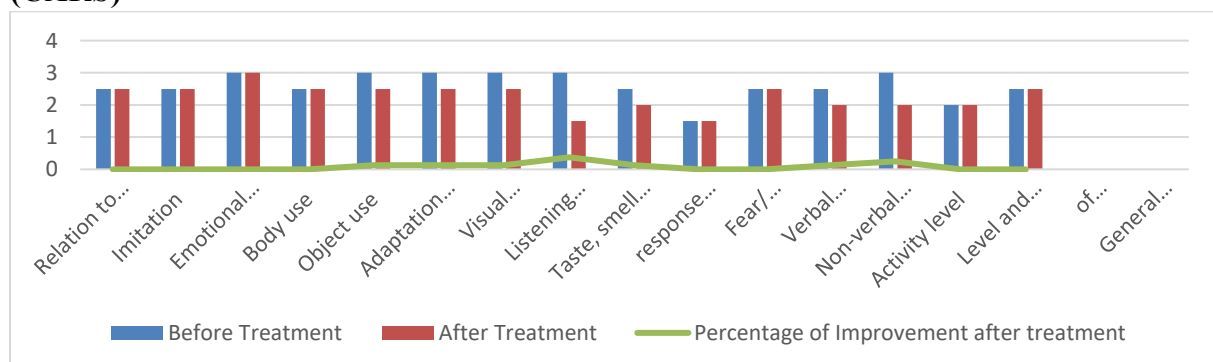
## RESULT

After three months of treatment, outcomes are as follows

**Table No:2: Evaluation of treatment outcome using Childhood Autism Rating Scale (CARS)**

Parameters for evaluation	CARS Score		Percentage of improvement after treatment
	Before treatment	After treatment	
Relation to people	2.5	2.5	0 %
Imitation	2.5	2.5	0 %
Emotional Response	3	3	0 %
Body use	2.5	2.5	0 %
Object use	3	2.5	12.5 %
Adaptation to change	3	2.5	12.5 %
Visual response	3	2.5	12.5 %
Listening response	3	1.5	37.5 %
Taste, smell & touch response and use	2.5	2	12.5 %
Fear/ Nervousness	1.5	1.5	0 %
Verbal communication	2.5	2.5	0 %
Non-verbal communication	2.5	2	12.5 %
Activity level	3	2	25 %
Level and consistency of intellectual response	2	2	0 %
General impression	2.5	2.5	0 %

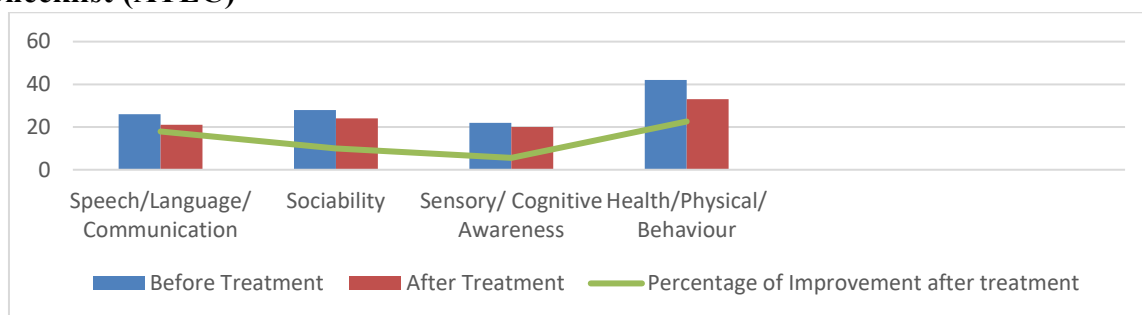
**Graph No.1-Evaluation of treatment outcome using Childhood Autism Rating Scale (CARS)**



**Table No:3 -Evaluation of treatment outcome using Autism Treatment Evaluation Checklist (ATEC)**

Parameters for evaluation	ATEC Score		Percentage of improvement after treatment
	Before Treatment	After Treatment	
Speech/Language/Communication	26	21	17.85
Sociability	28	24	10
Sensory/ Cognitive Awareness	22	20	5.56
Health/Physical/ Behavior	42	33	12

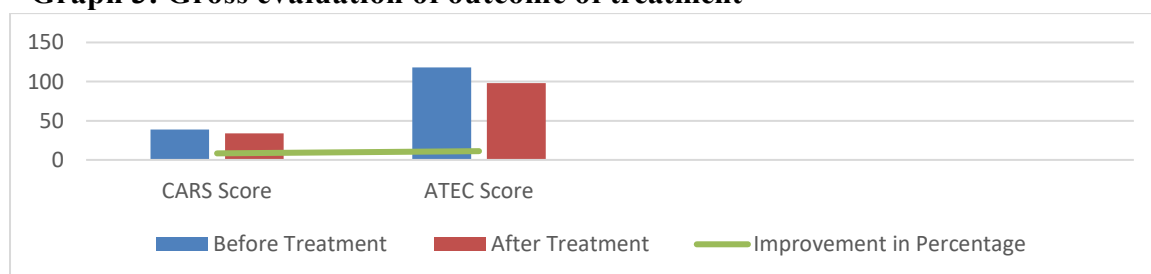
**Graph No:2 - Evaluation of treatment outcome using Autism Treatment Evaluation Checklist (ATEC)**



**Table No:4 - Evaluation of overall outcome of treatment**

Evaluation of overall outcome of treatment	Before Treatment	After Treatment	Percentage of improvement after treatment
Total score in CARS	39	34	8.34%
Total score in ATEC	118	98	11.18%

**Graph 3: Gross evaluation of outcome of treatment**



## DISCUSSION

No effective medications are currently available to treat ASD. Supplemental Melatonin has shown promise in treating sleep onset insomnia in children with autism spectrum disorders (ASD) [6]. Risperidone and Aripiprazole are the only FDA approved medications for ASD, and they are approved only for the treatment of irritability in 5-16year old with ASD [7].

*Ayurveda* has emerged with a cost-effective preventive and holistic approach to tackle it at very early age, providing a long-term intervention so as to eliminate the triggering elements of autism thereby improving the quality of life for such patients.

In present case *Shodhan chikitsa* (the purification therapy) aims at removal of the vitiated *Doshas* and correction of *Agni* and metabolic derangement which

are the prime causative factors of all diseases. It also facilitates the link between sense organs and brain efficiently. [8].

In Autism, mainly *Nasya* and *Basti* are more important procedures as *Nasya* stimulates the function of brain and all *Urdhvajatrugat* organs [9]. The olfactory nerves of the nose are connected with the higher centers of brain i.e., limbic system which include amygdaloidal complex, hypothalamus and basal ganglia etc. Thus, drugs administered to nostrils directly goes to higher centres of the brain and affects both nervous system and endocrine system of body by controlling vitiated *Doshas*. *Basti* is the main pathway of the gut-brain axis to pacify the vitiated *Vata* and stimulates brain function.[10]

Other pre-*Panchkarma* procedures and all previously narrated therapies support motor function by strengthening muscles, joints, ligaments and facilitate in achieving day to day activities on their own.

*Shamana Chikitsa* principle of the vitiated *Tridosha* predominantly *Vata* located in the *Shirah* (head) adopted in the present case report were with the oral administration of *Abhaya Ghrita* and *Mansmitra Vatakam*. *Abhaya Ghrita* is a *Lehana* formulation described in *Kashyapokta Lehadhyaya* consisting of six herbs Viz. *Brahmi* (*Bacopamonnieri*), *Vacha* (*Achorus calamus*), *Siddharthaka* (*Brassica campestris*), *Kushtha* (*Saussurea lappa*), *Sariva* (*Hemidesmus indicus*), and *Pippali* (*Piper longum*). Oral intake of *Abhaya Ghrita* protects the child from ill effects of *Pishacha*, *Rakshas*, *Yakshas*, and *Matrakas* (Invisible evil entities that can cause physical and psychological suffering to the child)[11]. *Abhaya Ghrita* improves speech, vocabulary, language, cognitive functions, memory, intelligence and vision. The ingredients largely have *Tikta*, *Katu*, *Madhura Rasa* which is responsible for *Agnideepana*

and *Amapachana* action, thereby maintaining optimal digestion, metabolism and assimilation process in the body and removing the toxins due to *Ama Dosh*.

Moreover, being a *Ghrita* based formulation, it provides added therapeutic properties of *Ghrita* like *Medhya*, *Ayu Vardhaka*, *Balavardhaka*, *Ojovardhaka*, *Vayasthapaka*, *Dhatuposhaka*, and *Unmada*, *Apasmara*, *Mada*, *Murcha*, and *Shoshanashaka* properties.[12]

*Manasamitra-vataka* contains the drugs like *Sankhapushpi* (*Convolvulus pluricaulis*), *yastimadhu* (*Glycyrrhiza glabra*), *godugdha* (cow's milk) and gold etc. which are famous for enhancing memory and intellect and the formulation itself is explained as *manodoshahara* (alleviates the *doshas* of *manas*), *prajna kara* (provides wisdom), *medhakara* (promote memory and intellect) and *pratibhakara* (makes talented).

Diet therapy comprises *Pathya* (indications) and *Apathya* (contra indications) with respect to diet and eating habits. This is done to enhance the effects of therapeutic measures and to impede the pathogenic processes.

After the completion of treatment duration, the patient showed significant improvement in core features of ASD and reduction of disease severity.

The present case report shows the efficacy of Ayurvedic treatment in the management of ASD with satisfactory outcomes. The results are encouraging considering the chronicity and non-availability of definite treatment in the contemporary science.

## CONCLUSION

This case demonstrates the clinical improvement in the patient of ASD with *Shodhana* and *Shamana Chikitsa* which is safe in comparison with sedatives and steroids. *Ayurvedic chikitsa* as a long-term intervention can provide much

better improvement in cases of ASD. There is need for further study on more populations with ASD to validate the efficacy of this intervention.

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