

A Case Study on Ayurvedic Management of Unmadam with special reference to Childhood Autism

Case study

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Abstract

Autism is one of the main concern of pediatrics in the present era. This neurodevelopmental disorder of unknown etiology begins in early childhood. The main characteristic features of Childhood Autism are impairment in communication skills, social interactions and reciprocity, and imagination and play. The features of Autism are much similar to that of *Unmadam* (disease of mind characterized by mental confusion etc.), a disease condition mentioned in Ayurvedic classics. Due to various etiological factors, 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). Along with this, the vitiation of three *doshas* (*Vata*, *Pitta*, and *Kapha*) will end up in the manifestation of *Unmada*. *Manovaha sroto-dushti* together with *Tridosha dusti* is the basic cause of Childhood Autism. A 7-year-old male child was presented with the complaints of poor eye contact, impaired socialization and communication, making a peculiar sound repeatedly, unaware of the situations of danger, thumb sucking and hyperactivity and facial dysmorphism. A systematic Ayurvedic treatment consisting primarily of *Vata-Pitta hara chikitsa* (treatment for pacifying *Vata* and *Pitta*) along with *Deepana-Pachana* (drugs for enhancing digestive power), *Snehana-swedana* (oleation with lipophilic drugs and sudation therapies), *Sroto-sodhana* (cleansing of channels which corrects the metabolism and does modulation of gut microbiome), *Brumhana* (nourishing treatments) and *Medhya rasayana* (drugs for promoting intellectual and cognitive functions) and *pathya krama* (congenial diet and habits) resulted in considerable relief of the condition.

Keywords: *Unmadam*, Autism Spectrum Disorders, Childhood Autism, Neurodevelopmental disorder .

Introduction

Autism is a neurodevelopmental disorder of unknown etiology (1). The cardinal features of Autism are impairment of social interaction, communication and imagination, and restricted interests and repetitive behavior. Childhood autism has its manifestations usually at around 18-24 months of age and is well established by 3 years of age (2). World Health Organization has estimated that worldwide 1 in 160 children has Autism Spectrum Disorder (ASD) (3). Latest survey by Autism and Developmental Disabilities Monitoring (ADDM) Network of Centre for Disease Control and Prevention (CDC) suggest a 15% increase in prevalence that 1 in every 59 children are being identified with Autistic Spectrum Disorder in the United States and is about 4 times more common among boys than in girls (4). These statistics calls for the urgency of evaluating this condition in scientific backgrounds. The exact cause of Autism is unknown (5). However, the various causes which are believed to contribute to the occurrence of Autism are genetic factors, various environmental factors, perinatal brain injury, hormonal imbalance etc. Abnormalities in brain

structure and function have also recommended by neuro-radiological and neurochemical studies. But, the findings of various studies are conflicting and there is no diagnostic imaging or other tests specific for Autism (6). The factors like emotionally distant parenting styles (refrigerator mothers) and MMR vaccination were previously thought as etiological factors for Autism. But currently, the causation of Autism by above-mentioned factors stays invalid (7). As per Ayurvedic classics, *Garbhopaghatakara bhavas* (the prenatal factors which harm the product of conception) (8) are considered as major etiological factors in its causation. Among cases of childhood Autism, etiopathogenic factors and line of treatment varies from individual to individual. This case study is only an example of childhood autism case where remarkable improvement was found in the condition by adopting Ayurvedic management, especially with *samana chikitsa* (treatment methods for pacification of diseases rather than purificatory therapies). The case is analysed adopting the various parameters of assessment of Autism which corresponds to those mentioned under *Unmada Nidana* and *Unmada chikitsa* in Ayurvedic classics and the results are discussed with possible correlations in the light of principles of etiopathology and management explained in classical Ayurvedic textbooks.

Etiopathogenesis of Autism as per Ayurveda

As per Ayurvedic classics, the acquisition of knowledge takes place by a sequence of events where the conjunction of *Atma* (soul / the self), *Manas* (mind),

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Indriya (sense organ), *Indriyārtha* (object of perception) happens in the order(9). *Atma* (the self) is responsible for the cognition, and *Manas* is the substratum of *Indriyas* (sense organs) to perceive *Indriyārtha* (object of perception). The factors responsible for the mental constitution of the fetus are *satwa* (mind) of mother and father, the objects of hearing, actions of the pregnant mother and past deeds (10). In children with Autism, the conjunction between *Atma* and *Manas* is disrupted. i.e.; *Manovaha-sroto-dusti* (vitiation of channels of consciousness that flows through mind) along with *Tridosha dusti* (vitiation of three *doshas*) is the characteristic feature of Childhood Autism. As per Ayurvedic classics, the same etiopathology is explained in the context of *Unmada* (Disease of mind characterized by mental confusion etc.). The characteristic features of *Unmada* (11) as per Ayurvedic classics are:

1. *Manovibhrama* (perversion of mind) - Due to this, the subject does not think about such matters which are worth thinking, and he/she also indulge in thinking about the matters which he/she is not supposed to think about.
2. *Budhi vibhrama* (perversion of intellect) - Due to this, the subject understands the eternal things as non-eternal and advantageous as disadvantageous.
3. *Samjnajnana vibhrama* (impaired sensory perception)
4. *Smruti vibhrama* (impairment of memory)
5. *Bhakti vibhrama* (abnormal desires)
6. *Sheela vibhrama* (inappropriate manners and behaviors)
7. *Cesta vibhrama* (abnormal activities)
8. *Achara vibhrama* (loss of learned skills)

By analyzing the etiopathology and clinical features of Autism, it can be included under the broad spectrum of *Unmada*.(12) In this case report, the Ayurvedic view of etio-pathogenesis of Childhood Autism along with its treatment principles are discussed.

Line of Treatment of Autism as per Ayurveda

The classical management of *Unmada* mentioned in Ayurvedic classics is found to be very effective in the management of Autism Spectrum Disorders. *Deepana* and *Pachana* which are the procedures in which various drugs are used for promoting digestion, *Snehapana* (oral intake of medicated ghee preparation), *Mridu Sodhana* (Mild purification of body by emesis or purgation), *Niruha basti* (decoction enema) and *Sneha basti* (oil enema), *Siro Virechana* or *nasya* (medicated nasal drops), *Samjna prabodhana* (medication to stimulate the mind). Apart from the *Sodhana* (purificatory) therapies mentioned in Ayurvedic classics, *Abhyangam* (oil massage of head and body), *Siropichu* (Overhead application of a piece of cotton dipped in medicated oil), *Sirodhara* (pouring of medicated oil over the forehead as a continuous stream), *Sirolepam* (Overhead application of medicinal paste), and *Takra dhara* (pouring of medicated buttermilk over forehead as a continuous stream) are various treatment modalities aimed to promote the development of brain and to reduce or control the troublesome behaviours found with Autism Spectrum Disorders(13). As per *Caraka Samhita*, the avoidance of Meat and intoxicating drinks, intake of

Hitahara (compatible foods), following cleanliness and possessing a good mental strength can prevent the disease *Unmada* and, the person cured of *Unmada* will attain clarity of *Indriyārtha* (objects of senses), *Buddhi*, *Atma*, *Manas* and normalcy of *dhatus* (14). Autism is regarded as a lifelong condition due to *Bija dosha* (genetic predisposition). But, by adopting *Unmada chikitsa* as a long-term intervention the triggering elements of Autism can be eliminated thereby the quality of life can be improved.

Case report

Personal data and presenting complaints

A seven year-old male child was presented with the following complaints: poor eye contact, impaired socialization and communication, making a peculiar sound repeatedly, unaware of the situations of danger (foreg: fire, vehicles in road etc.), thumb sucking and hyperactivity and facial dysmorphism. He was Hindu by religion and was the second child born to a middle-class, literate, non-consanguineous parents.

History of present illness

The child was the second offspring of non-consanguineous parents, the age of mother at the time of gestation was 29 years. There was history of abortions before the birth of first child. Blood group of mother was A-Negative and that of Father was B-Positive, and the baby was A-Negative. Because of breech presentation, LSCS was done at Full-term. The baby cried soon after birth, and birth weight was 3.5 Kg. The mother and baby were discharged from hospital on the fifth day after delivery. No other relevant post-natal events were reported. As months passed away, parents noted the delay in child's developmental milestones. i.e.; the child has not attained the social smile and he was found to be repeatedly making a peculiar noise, for which they approached a hospital and undergone the investigations like vision and hearing tests, Karyotyping and MRI Brain. MRI report suggested delayed myelination in both cerebral hemispheres. The child was identified to have deficient IQ level and so was undergoing education in special school.

History of past illness

The child had complaints of vomiting and indigestion more frequently till his fifth year of age.

Developmental History

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

Milestones and age of attainment:

Gross motor:

- Head control: 10th month
- Turning over: 4th month
- Sit with support: 5th month
- Sit without support: 6th month
- Crawling: 8th month
- Stands with support: 10th month
- Walking without support: 1½ years

Fine motor:

- Grasping, Self-feeding, Buttoning: Attained
- Drawing: Not attained

Social milestones:

- Social smile: Not attained
- Responds to name: Not attained
- Indicates his wants: Not attained
- Dry by day: Attained
- Dry by night: Attained
- Dresses unassisted: Not attained

Language:

- Dada, Mummy: Attained at 3 years of age
- Small sentences: Not attained
- Story telling: Not attained

Immunization History

The child was immunized as per schedule

Dietetic History

The child was exclusively breastfed up to 6 Months. Weaning started at 6 months with ragi, banana etc. and he was breastfed till 5 years of age. Presently the child takes regular foods including fruits and cooked rice, pulses etc.

Family History

There was no relevant family history.

Personal History

Diet was Non- vegetarian and child had moderate appetite. Bowels and micturition were normal. But toilet-training was not attained and so had complaints of soiling of pants. Sleep was Sound. The child had a habit of making a peculiar sound repeatedly. Allergies of any kind was not reported.

General Examination

On general examination, the child was Hyperactive inattentive, making a peculiar sound repeatedly, with poor socialization and communication, having a normal attitude and posture, moderate built and nourishment, and facial dysmorphism.

Vital signs and Anthropometry were within normal limits.

Head to foot Examination

The head-shape and size appeared normal with no frontal bossing. The Fontanelles were closed by 1 ½ year of age, and were non-pulsatile and normal. Hypopigmentation of hair was noted. Facial dysmorphism was present with normal eyes, low-set ears and flat nasal bridge. Dentition was normal. Neck, Skin, Limbs, Chest, Spine, Abdomen and Genitalia were normal.

Ashtasthana Pareeksha

1. *Nadi: Vata-Pitta*
2. *Mootram: Prakrutam* (Normal quantity and normal color)
3. *Malam: Pinditham* with *Pandu-sweta varnam*
4. *Jihwa: Normal, Anupalipitam*
5. *Sabdham: Neither guru nor sphutam* (speech not attained)
6. *Sparsham: Ardram*

7. *Drik: Jalardram*

8. *Akriti: Vata-Paittika*

Systemic Examination

No abnormalities were detected in examinations of Respiratory, Cardiovascular, Gastro-intestinal, Urogenital systems. Central Nervous System was affected. In the domain of Higher Mental Functions of the child, Appearance and behavior were noted as Hyperactive, Inattentive child, making a peculiar sound repeatedly, and with poor socialization and communication. The child was conscious with no delusion, Illusion and Hallucination and he was oriented to time and place. A deficiency was noted in memory and Intelligence. Impairment in both verbal and non-verbal communication was noted. The Cranial Nerves, Motor system, Reflexes, Sensory system and gait were normal with absence of Cerebellar signs.

Rogi pareeksha

1. *Dosha: Vata-Pitta pradhana Tridosha, Rajas and Tamas*
2. *Dooshya: Rasa*
3. *Desha: Deha- Sarvadeha; Bhumi- Sadharana*
4. *Balam: Roga balam- Pravaram; Rogi balam-Avaram*
5. *Kalam: Kshanadi- Sarva rtu; Vyadhyavastha-Puranam*
6. *Agni: Madhyamam*
7. *Prakruti: Vata-pitta*
8. *Vaya: Baala*
9. *Satwa: Avara*
10. *Satmya: Madhyama*
11. *Ahara: Abhyavaharana- Pravara; Jarana- Pravara*

Investigations and other assessments:

1. Karyotyping showed Normal male karyotype.
2. MRI Brain (At 1 year of age) pointed to the presence of Arachnoid cyst in the left temporal region and Delayed myelination for age in both hemispheres.
3. Vision and Hearing tests were Normal

Specific assessment tools used for evaluation of Autism:

1. Autism Treatment Evaluation Checklist score (ATEC): The Autism Treatment Evaluation Checklist (ATEC) was developed by Bernard Rimland and Stephen M. Edelson of the Autism Research Institute. The ATEC is a one-page form designed to be completed by parents, teachers, or caretakers. It consists of 4 subscales namely Speech/ Language Communication with 14 items, Sociability with 20 items, Sensory/ Cognitive Awareness with 18 items and Health/Physical/Behavior with 25 items (15). Questions in the first three subscales are scored using a 0–2 scale. The fourth subscale, Health/Physical/Behavior, is scored using a 0–3 point scale. The scores from each subscale are combined in order to calculate a Total Score, which ranges 0–179 points. A lower score indicates a lower severity of ASD symptoms. This questionnaire is

designed to measure the changes in severity of ASD in response to treatment (16).

2. Childhood Autism Rating Scale score (CARS): The CARS consists of 14 domains for assessing behaviors associated with autism, with a 15th domain rating general impressions of autism. Each domain is scored on a scale ranging from 1 to 4 and the higher scores are associated with a higher level of impairment. Total scores can range from 15 to 60, and scores below 30 indicate that the individual is in the non-autistic range, scores between 30 and 36.5 indicate mild to moderate autism, and scores from 37 to 60 indicate severe autism (17). According to this criteria, the present case has a score indicating severe autism.

Provisional Diagnosis

The clinical condition was provisionally diagnosed as *Unmadam* which can be correlated to Childhood Autism.

Samprapti (Etiopathogenesis)

The analysis of etiopathogenesis reveals the involvement of multidimensional factors. The prenatal cause is *Beeja dusti* (18) (vitiation of sperm and ovum which is considered to result in genetic defects in offspring) of both parents which can be assumed from the history of previous abortions. Along with this, the *Upaklista satwa* (debilitated mind) and *Utsanna Bahudoshha* (excessively aggravated *doshas*) (19) are involved as *Garbhopaghatakara bhavas* (prenatal factors negatively affecting fetus)(20), representing *Manasika* and *Shareerika* (mental and physical) factors respectively which has ended up in the formation of a *Garbha* (fetus) which is of *Heena satwa* (decreased mental abilities). Besides this, the breech presentation of the fetus which demanded LSCS resulted in *Pranavahasroto dusti* (vitiation of channels carrying the element of life) which lead to *Upaksheena deha* and *Manas* (debilitation of body and mind). The condition is predominated with vitiation of *Tridoshas* with more aggravation of *vata* and *pitta* and the *doshas* of mind, namely *Rajas* and *Tamas*. This has successively resulted in *Manovaha sroto dusti* (vitiation of channels of consciousness that flow through mind) in the child during postnatal period. Then the aggravated *doshas* get localized at the level of *Manas* and *Hridaya*. *Hridaya* is the seat of six *angas* (divisions of body), knowledge, sensual faculties, five senses, *Atma*, *Manas* and *Chintya* (an object of mind involved in thought process) (21). Therefore the objects and functions of *manas* (mind) are badly affected by the localization of *doshas* at *manas* and *hrdaya*. Moreover, the *avarana* (covering) of *Prana vata* (one among five subtypes of *Vata* which move towards the head) in *Manovaha srotas* hampers its normal functions like *Budhi-hridaya-indriya-chitta dharana* (maintaining the intellect, *Hridaya*, sense faculties, mind in normal condition). *Sadhaka pitta*, seated in *hrdaya* which is responsible for receiving the knowledge of objects of senses and memory etc. by the instruments like *budhi*(intellect), *medha*(ability of learning), *abhimana* (feeling of one's self) etc. is vitiated. The condition was further worsened by

Annavaaha srotodusti (vitiation of channels carrying the food) by affecting *Agni* (digestive fire) and *Rasavaaha srotodusti* (vitiation of channels carrying *rasa*) which was characterised by indigestion and vomiting in child. All these factors together culminated in *Vibhramsha* (impairment) of *Manas* (mind), *Buddhi* (intellect), *Smriti* (memory), *Bhakti* (desires), *Samjna Jnana* (sensory perception), *Sheela* (manners and behaviors), *Chesta* (activities), *Acharya* (learned skills) to manifest with hyperactivity, the deficit in social interaction, communication, intellect, behavior and abnormal mannerisms, etc. as *Unmada* (Childhood Autism).

Final Diagnosis

The condition was diagnosed as *Unmadam* (Childhood Autism) after analyzing Autism Treatment Evaluation Checklist and Childhood Autism Rating Scale and evaluating the etiopathogenesis and presentation of *Unmada* in Ayurvedic parlance.

Analysis of Clinical Presentation

Table: 1- Analysis of Clinical Presentation

Feature of <i>Unmada</i>	<i>Dosha</i> predominance	Feature of Autistic Spectrum Disorder
Always running about	<i>Vata</i>	Hyperactive
The frequent utterance of uncontrolled sound and voice	<i>Vata</i>	Monotonous speech, Oddity in speech
Frothing of saliva	<i>Vata</i>	Drooling of Saliva, Sucking of fingers
Excessive screaming, dancing and singing and playing musical instruments at improper places or occasions	<i>Vata</i>	Fond of music, dance etc., Screaming without any reason.
Aversion or competition for freely available food	<i>Vata</i>	Overeating
Intolerance, Impatient	<i>Pitta</i>	Reluctance or impatience for taking turns
Anger	<i>Pitta</i>	Temper tantrums
The desire for tree shade, cold water, and food	<i>Pitta</i>	(Desire for tree shade, cold water, and food)
Excessive heat or anguish	<i>Pitta</i>	Excessive distress
Liking for loneliness	<i>Kapha</i>	Show less attention to social stimuli, Smile and look at others less often, Solitary play.

Chikitsa (Treatment):

Table: 2- Chikitsa (Treatment)

<i>Samprapti ghatakas</i>	Factors involved	<i>Samprapti vighatanam</i>
<i>Dosha</i>	<i>Vata-Pitta pradhana Tridosha, Rajas and Tamas</i>	<i>Snehana(Sarpi pana), and Abhyanga, Swedana, mrudu shodhana, Virechanam, Vasti</i>
<i>Dooshya</i>	<i>Rasa</i>	<i>Jatharagni deepanam with internal medications, sroto shodhanam</i>
<i>Srotas</i>	<i>Rasavaha, Manovaha srotas</i>	<i>Deepanam, Srotoshodhanam, Brumhanam, Medhya rasayana prayogam</i>
<i>Nidana</i>	<i>Beejadushti, Avarana</i>	<i>Avarana chikitsa</i>
<i>Adhistana</i>	<i>Hridaya and Manas</i>	<i>Hridya and Samjna prabodhana (medication to stimulate mind), Medhya</i>
<i>Rogamarga</i>	<i>Madhyama</i>	<i>Sirodhara, Sirolepam, Pratimarsha nasyam</i>
<i>Vyakta sthana</i>	<i>Manovyapara and Sareera chesta</i>	Therapies which work at physical, mental and spiritual levels
<i>Roopa</i>	<i>Vibhrama of Manas, Budhi, Smriti, Bhakti, Samjnanjana, Sheela, Chesta, Achara exhibiting Vata-Paittika pradhana Unmada Lakshanas</i>	<i>Deepana and Pachana, Snehapana, Mridu sodhana, Niruha basti, Nasya, Samjna prabodhana</i>
<i>Sadhyasadhyat a</i>	<i>Asadhya or Yasya</i>	Long term intervention

Treatment done

The treatment consisting of *Vata-Paittika Unmada chikitsa* including *deepana-pachana* (treatment with digestive and carminative drugs to maintain *Agni*, the digestive fire in normalcy), *sroto-sodhana* (clearing the channels of the body for making the absorption of drugs and diet in appropriate manner

and ultimately to allow the circulation of *Tridoshas* and *dhatus* properly which paves the way for nourishment of subsequent *dhatus* from *rasa* to *shukra*) followed by *brumhana* (therapy to bring about nourishment), *hridya* (medication which is good for mind), *samjna prabodhana* (medication to stimulate mind), and *medhya rasayana* (drugs for improving memory and intellect) together with psychotherapy, behavior therapy, and speech therapy were adopted to manage the condition.

Samana chikitsa (pacification therapy) was preferred than *Sodhana chikitsa* (purification therapy) considering the age and strength of patient. Initially *Kashayadhara* was done with *Drakshadi kashaya* for five days. *Kashayadhara* is a procedure in which medicated decoction is poured throughout the head and body in a continuous flow. It was followed by *Sirolepam* (application of medicated paste over the scalp) with *Baladi yoga* for seven days. *Baladi yoga* is mentioned in the textbook *Arogyakalpadruma* in the context of *Unmada chikitsa*. Then *Abhyangam* (oil massage) with *Aarukaladi tailam* followed by *Ksheeradhoomam* with *Balaksheeram* was done for seven days. *Ksheeradhoomam* is a procedure where the patient is treated with the steam coming from heating medicated milk through a tube. Then *Sirolepa* was done for seven days with *Mustadi yoga*. After this, for seven days, *Pratimarsha Nasyam* (nasal instillation of medicated nasal drops in low dosage) with *Ksheerabala tailam 21 Avarti* was done. Later *Kayasekam* followed by *Sirodhara* was done with *Ksheerabala tailam* for seven days. *Kayasekam* is a procedure in which fomentation is given by pouring warm medicated oil in a stream. *Sirodhara* is slowly and steadily dripping the medicated oil over the forehead. *Shastika lepam* (*shastika sali*, a special variety of rice cooked in medicated decoction and made in to paste and added with suitable oil is applied all over the body) with *Aarukaladi tailam* for seven days. These procedures and formulations are selected based on their predominant *Vata-Pitta* subsiding nature and their special effect on mind.

Internal medicines were administered in appropriate dose, formulation and potency as per the information gathered from *Dasavidha pareeksha* (ten points of examination) explained in Ayurvedic classics. *Drakshadi kashayam* was prepared as per *toyapaka vidhi* and dispensed as *Muhurmuhu panam* (frequent intake). Here, the medicines for preparing decoction are boiled in to a more diluted form for frequent intake. The powder *Kalyanavaleha choornam* was administered in the dose of half teaspoon with honey, and *Tiktaka ghritam*, medicated ghee was given as 10 ml with a pinch of *Saindhava lavanam* (rock salt) twice daily before food. The tablet *Manasamitra-vatakam* one tablet was given at bedtime with boiled and cooled water. A fermented preparation for childhood diseases namely *Aravindasavam* was administered as 15 ml with 30 ml boiled and cooled water, twice daily after food.

Dietary advices

In Ayurveda, the *pathya* (wholesome) and

apathya (unwholesome) supplements, the do's and don'ts are the backbone of success of any treatment as well as for the prevention of diseases. The *pathya* for the present case are *Medhya* (that which promotes memory and intellect), *Hrdya* (that which is good for mind), *Brumhana* (that which is nourishing), *Shastika Shali* (a variety of rice which is grown and harvested within 60 days), *Ghrta* (ghee), *Madhu* (honey), *Yava* (*Hordeum vulgare*), *Dadima phala* (pomegranate fruit), *Amra phala* (mango fruit). The *apathya* are *Mamsa* (meat), *Rooksha* (dry), *Katu* (pungent taste), *Ushna* (hot in potency), *Vidahi* (that which creates burning sensation), *Vata-Pitta vardhaka ahara-vihara* (the diet and activities which aggravate *Vata* and *Pitta*).

Karyaphala (Improvements):

The outcomes of the treatment were evaluated using the Autism Treatment Evaluation Checklist (ATEC) and the Childhood Autism Rating Scale (CARS).

Table No:3 : 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	4	3	25%
Imitation	3.5	3.5	0.00%
Emotional Response	4	4	0%
Body use	1.5	1	12.50%
Object use	2	2	0%
Adaptation to change	2	1.5	12.50%
Visual response	3.5	3	12.50%
Listening response	4	2	50%
Taste, smell & touch response and use	3	2	25%
Fear/ Nervousness	2	1.5	12.50%
Verbal communication	3.5	3.5	0.00%
Non-verbal communication	3	2	25%
Activity level	3	2.5	12.5%
Level and consistency of intellectual response	3.5	3.5	0.00%
General impression	3.5	2.5	12.50%
Total Score	46	37.5	14.17%

Graph No:1- Evaluation of Treatment outcome based on Childhood Autism Rating Scale

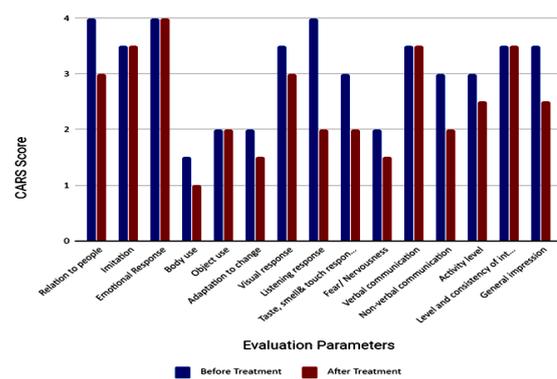


Table No:4 -Evaluation of treatment outcome using Autism Treatment Evaluation Checklist (ATEC)

Parameters for evaluation	ATEC Score		Percentage of improvement after treatment
	Before Treatment	After Treatment	
Speech/Language/Communication	26	23	10.72%
Sociability	26	15	27.5%
Sensory/ Cognitive Awareness	26	18	22.22%
Health/Physical/Behaviour	22	11	14.66%
Total Score	100	67	18.44%

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

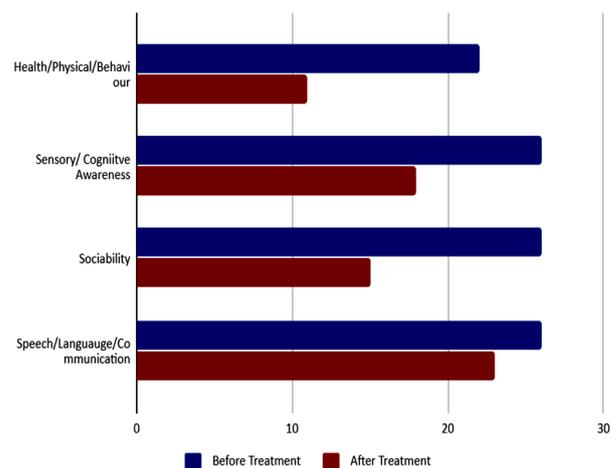
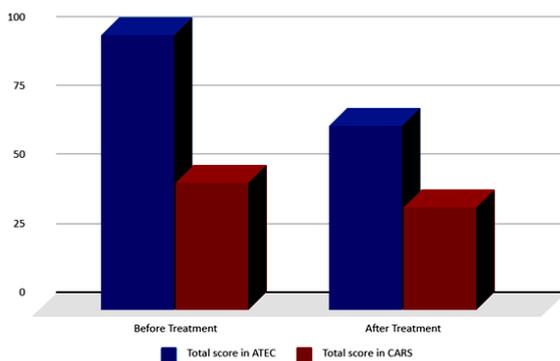


Table: 5: Gross evaluation of outcome of treatment

Evaluation of overall outcome of treatment	Before Treatment	After Treatment	Percentage of improvement after treatment
Total score in ATEC	100	67	18.44%
Total score in CARS	46	37.5	14.17%

Graph 3: Gross evaluation of outcome of treatment



Discussion

Childhood Autism which is correlated to *Unmadam* is a condition with involvement of both mind and body. Eventhough it is regarded that the exact etiology is unknown, Ayurveda postulates very relevant etiology complex for this condition. The present case discussed here is merely an example where the etiopathology of childhood autism as per Ayurvedic classics can be explained elaborately so that the line of management can be formulated accordingly. The detailed history along with examinations like *Ashta Sthana pareeksha*, *Dasavidha pareeksha*, Systemic examinations, along with investigations like Karyotyping, MRI and also the ATEC and CARS which are the specific tools for Autism evaluation greatly contributes to the proper evaluation and formulation of exact *Samprapti* (etiopathogenesis) of the condition. The subscales of ATEC are Speech/Language/Communication, Sociability, Sensory/Cognitive awareness and Health/Physical/Behaviour. And CARS evaluates relation to people, imitation, emotional response, body use, object use, adaptation to change, visual response, listening response, taste, smell and touch response and use, fear/nervousness, verbal communication, non-verbal communication, activity level, level and consistency of intellectual response and general impression. All these parameters significantly contribute to the identification of childhood autism along with its *dosha*-predominance and in the understanding of changes happening over a particular period with more specificity to each and every aspect of behavioural development.

The *samprapti* of this case involve *Beejadusti*, *Pranavaha*, *Annavaha*, *Rasavaha* and *Manovaha srotodusti*, *Vata-Pitta pradhana Tridosha-dusti* along with aggravation of *Manodoshas*. The aggravated *doshas* get localized at *hrdaya* and *manas*. *Manas* is situated in *siras* (head) and *hrdaya* (heart region) even though whole body is its seat. *Siras* is an important *marma* (vital point) with its crucial role in various functions of mind as well as controlling it. The health of *Manovaha srotas* primarily depends on the health of *Siromarma* and *Hrdaya*. *Pranavayu* which traverses to *Siras* is holding the *budhi*, *hrdaya*, *indriya* and *chitta*. *Hrdaya* is a *marma* which holds the root of *Rasavaha srotas*. *Rasavaha srotas* has its close relation to *manas*, as *manas* is situated in *hrdaya* which is the root of

rasavaha srotas and *rasavaha srotas* is vitiated by excessive thinking where the object of *manas* is *chintya* (power of thinking). The subtype of *Pitta* involved here is *Sadhaka pitta* seated in *hrdaya* which is responsible for achievement of one’s aspirations by means of *budhi* (intellect), *medha*(ability for learning), *abhimana* (feeling of self) etc. *Beeja dusti* is responsible for the abnormalities of sperm and ovum which is manifested as the previous abortions in mother. Appropriate purification therapies, proper prenatal care can greatly help in tackling *beejadusti*. *Agni* (digestive fire) plays an inseparable role in the manifestation of autism. The unhealthy dietary habits like *asuchi bhakshana* (ingestion of unclean food) and *viruddhahara* (incompatible diet) is considered to result in *Unmada*. The theory of Gut-brain axis of Autism supports the concept of role of vitiated *Agni* in its causation. The human enteric microbiota has a potential relation to central nervous system. The disturbances in this gut-brain axis plays a major role in causing neurodevelopmental disorders like autism. In such conditions, the therapeutic interventions over gut-microbiota causing its modulation can ultimately provide the solution to such disorders.(22) In the present case the role of disturbance to *Agni* is revealed by the history of episodes of vomiting and indigestion till the fifth year of age. As *Agni* is the fundamental necessity for metabolism in body, all the factors which contribute to its disturbance directly puts the condition to a more complicated scenario. The *samana chikitsa* (pacification therapy) was given preference over *sodhana chikitsa* (purification therapy) considering the age, delicateness, strength of the child etc. *Drakshadi kashaya* helps in subsiding the aggravated *vata* and *pitta*, corrects the *agni* and acts on *rasavaha srotas* and *manovaha srotas*. *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). The drugs of *Tiktaka ghritam* are predominantly bitter in taste. The drugs with bitter taste are good for alleviating *pitta*. The plain ghee subsides *vata* and *pitta*, and it promotes *dhi* (intellect), *smriti* (memory), *medha* (ability to learn), and *agni* (digestive fire). The ghee due to its ability called *samskaravahitwa* (carry the properties of drugs processed with it) imparts *pitta*-alleviating action as well as maintain its own functions like promoting intellect etc. Moreover lipophilic drugs are proved to penetrate Blood-brain barrier(23). Therefore it’s the greatness of scholars of Ayurveda who explained a lot of medicated ghee preparations in the context of diseases of mind and also in seizures.

It is ideal to administer the ghee formulation in this condition. When *saindhava lavana* is added to ghee preparation, it spreads all over the body very quickly. (24) *Kalyanavaleha choornam* is a medicated powder which enhances the ability of speech and language as

well as it promotes memory. The innate *lekhana* (ability to scrap out excess tissues) property of the formulation and *kapha chedana* (breaking *kapha*) and *kapha vilayana* (dissolving *kapha*) property of honey clears the *srotas* (channels) effectively. This is very important for correcting the metabolism. *Aravindasavam* is a nourishing drug explained in *Bhaishajyaratnavali* under *Balaroga chikitsa* and is used widely in pediatric disorders. It kindles *Agni* and promotes strength and longevity of life. It subsides the diseases caused due to *graha* (exogenous factors). *Agantu unmada* (disease of mind caused by exogenous factors) is considered to be caused by *graha*. So *Aravindasava* is an ideal formulation for this condition.

After the treatment, considerable improvement was noted in sociability and sensory/cognitive awareness followed by health/physical/behaviour and speech/language/communication. A 50% improvement was noted in listening response. The domains of Relation to people, taste, smell and touch response and use, and non-verbal communication showed a 25% improvement. Besides this, the body use, adaptation to change, visual response, fear/nervousness, activity level and general impression were improved considerably. The total ATEC score has shown an improvement of 18.44% whereas CARS 14.17%.

Conclusion

The line of management of Childhood Autism is decided based on the etiopathogenic factors in each individual. As per the change in these factors, the treatment also varies from person to person. In general, childhood Autism is to be treated with therapies which work at the physical, psychological and spiritual aspects. Therefore the basic treatment principle in Ayurveda, consisting of *Yukti vyapasraya chikitsa* (Rational Medical Management), *Satwajaya* (Mind or self-control techniques) and *Daivavyapasraya chikitsa* (confidence building treatment) are adopted in the management of Autism (25). These are applied appropriately considering the age of the child, factors for causation, pathogenesis, clinical manifestation etc. Till date, no interventions have been proven to alter the genetic makeup of children affected with Autism. But, the application of appropriate treatment modalities as described in *Unmada chikitsa* as a long-term intervention can provide much better improvement in cases of childhood Autism. The principles for prevention of diseases put-forward by Ayurveda like codes of conduct for a healthy living including *Dinacharya*, *Rtucharya*, *Swasthavrutta*, *Achara rasayana* and the specific ways of living like *rajaswala charya*, *rtumati charya*, pre-conceptional care, *garbhini charya*, various *samskaras* pre and post birth of the baby are considered to protect the child from diseases by supporting physical, mental and spiritual aspects of health. The foundation stone in prevention of Autism as per Ayurvedic system is the promotion holistic health.

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References

1. Robert M. Kliegman, Richard E. Behrman, Hal B. Jenson, Bonita F. Stanton. Nelson Textbook of Paediatrics. 18ed. Philadelphia; Elsevier/Saunders; 2007. 133-136p
2. Mahadeviah MS. Cerebral Palsy, Mental Retardation and Autism. IAP Textbook of Pediatrics. 5ed. Gwalior; Jaypee; 2013. 394p
3. Who.int. Autism Spectrum Disorders. [Online]. Available from: <https://www.who.int> [Accessed 11 December 2018].
4. Cdc Gov. Centers for Disease Control and Prevention. [Online]. Available from: <https://www.cdc.gov/index.htm> [Accessed 11 December 2018]
5. Robert M. Kliegman, Richard E. Behrman, Hal B. Jenson, Bonita F. Stanton. Nelson Textbook of Paediatrics. 18ed. Philadelphia; Elsevier/Saunders; 2007.133-136p
6. O.P.Ghai. Normal and Abnormal Development. In: O.P Ghai, , Vinod K Paul, Aravind Bagga. GHAI Essential Pediatrics. 7ed. New Delhi; CBS Publishers & Distributors; 1982. 40-41p
7. Robert M. Kliegman, Richard E. Behrman, Hal B. Jenson, Bonita F. Stanton. Nelson Textbook of Paediatrics. 18ed. Philadelphia; Elsevier/Saunders; 2007. 133-136p
8. Prof. Premavati Tewari. Ayurvediya Prasuti tantra evam stri roga - Part 1 (reprint). 2 ed. Varanasi; Chaukhambha Orientalia; 2009.228p
9. Chakrapani, Agnivesa. In: Vaidya Jadavji Trikamji Acharya(ed.) Caraka Samhita(reprint) Varanasi; Chaukhambha Prakashan; 2007. 56p.
10. Agnivesha. Jaatisootriyam sareeram. In: Yadavji Trikamji Acharya (ed.) Caraka Samhita (reprint). Varanasi; Chaukhambha Prakashan; 2007. 340-352p.
11. Agnivesa, Vaidya Jadavji Trikamji Acharya. Caraka Samhita(reprint) Varanasi; Chaukhambha Prakashan; 2007. 223p.
12. Ramachandran SK. AUTISM. Kottakkal; Kottakkal Arya Vaidya Sala; 2009. 11p
13. Ramachandran SK, Understanding and Management of Autism Spectrum Disorders-An Ayurvedic Perspective. In Souvenir-International seminar on Kaumarabhritya –updates, scopes and challenges. Jamnagar; Department of Kaumarabhritya, IPGT&RA; 2016. 29-41p.
14. Agnivesha. Unmada Chikitsitam. In: Yadavji Trikamji Acharya (ed.) Caraka Samhita. Varanasi; Chaukhambha Prakashan; 2007.467-474p.
15. Autism research institute. Autism Treatment Evaluation Checklist (ATEC). [Online]. Available from: https://www.autism.com/ind_atec [Accessed 17 December 2018].
16. Mahapatra, S., Vyshedsky, D., Martinez, S., Kannel,

- B., Braverman, J., Edelson, S. M., & Vyshedskiy, A. (2018). Autism Treatment Evaluation Checklist (ATEC) Norms: A "Growth Chart" for ATEC Score Changes as a Function of Age. *Children (Basel, Switzerland)*, 5(2), 25. doi:10.3390/children5020025
17. Schopler E, Reichler R, Rochen Renner B. The childhood autism rating scale. Western Psychological Services; 1988.
18. Agnivesha. Atulyagotreeyam Shareeram. In: Yadavji trikamji acharya (ed.) Caraka Samhita. Varanasi; Chaukhambha Prakashan; 2007. 301-308p.
19. Agnivesha. Unmada Nidanam. In: Yadavji trikamji acharya (ed.) Caraka Samhita. Varanasi; Chaukhambha Prakashan; 2007. 222-225p.
20. Agnivesha. Jatisootriyam shareeram. In: Yadavji trikamji acharya (ed.) Caraka Samhita. Varanasi; Chaukhambha Prakashan; 2007. 340-352p.
21. Agnivesha. Arthe dasa mahamooleeyam. In: Yadavji trikamji acharya (ed.) Caraka Samhita. Varanasi; Chaukhambha Prakashan; 2007. 183-192p.
22. Li, Q., & Zhou, J.-M. (2016). *The microbiota-gut-brain axis and its potential therapeutic role in autism spectrum disorder. Neuroscience*, 324, 131-139.
23. Abbott, N. J., & Romero, I. A. (1996). *Transporting therapeutics across the blood-brain barrier. Molecular Medicine Today*, 2(3), 106-113. doi:10.1016/1357-4310(96)88720-x .
24. Agnivesha. Snehadhyayam. In: Yadavji trikamji acharya (ed.) Caraka Samhita. Varanasi; Chaukhambha Prakashan; 2007. 81-87p.
25. Agnivesha. Unmada Nidanam. In: Yadavji trikamji acharya (ed.) Caraka Samhita. Varanasi; Chaukhambha Prakashan; 2007. 222-225p.
