Published online in http://ijam.co.in ISSN No: 0976-5921

International Journal of Ayurvedic Medicine, Vol 13 (1), 171-176

A case study on the ayurvedic management of Autism spectrum disorder (ASD - Vatapaitika unmada) using medhogulika and bhunana taila

Research Article

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Abstract

Autism spectrum disorder (ASD) is a complex developmental condition characterized by qualitative abnormalities in social interactions, reduced communication skills, and restricted repetitive behaviors and activities. There is no direct reference to ASD in *Samhitas* and it can be considered as an *Anukta vyadhi*. *Unmada*, a disease that afflicts *manovaha srothas,* is characterized by the perversion of intellect, mind, and memory.ASD can be correlated to *Vatika unmada*. The treatment of *unmada* involves various *Ayurvedic* formulations. *Medha gulika* is a polyherbal formulation indicated in anxiety and mental depression, dementia and it improves memory, concentration, and brain functioning (*medhya*). *Bhunaga Talia* is an *anubhootayoga* indicated in treatment of *apasmara*, *bhootonmada*, *vaksanga* etc.*Nasya* and *shiroshirodhara* are effective in treating *manovaha srothovikaras***.** *Bhunaga taila* and *Medha gulika* can be combined to develop an effective treatment protocol for ASD. The main aim of this study is to develop a protocol of treatment for a patient suffering from ASD, which helps manage the symptoms and make behavioral improvement. A 5-year-old female child who was brought to the OPD with the diagnosis of ASD was treated with both these medicines and the changes before and after the treatment was noted based on the Trivandrum Autism Behavioral Checklist (TABC). Minimal improvement was noted in the behavior of the child following treatment of 90 days.

Key Words: ASD, Autism, *Bhunaga Taila*, *Medha gulika, Unmada , Manovaha srothas.*

Introduction

Autism spectrum disorder (ASD) is a complex developmental condition characterized by persistent challenges with social communication, restricted interests, and repetitive behavior (1). ASD includes autism, Asperger's syndrome, Childhood disintegrative disorder, etc. (2). Three major characteristic features of ASD involve impaired social interaction, impaired communication, and impaired imagination. Although the exact cause of Autism is not known, the studies point towards multifactorial etiology with strong genetic influence (3). The diagnosis involves CHAT (Checklist for Autism in Toddlers), M-CHAT(Modified CHAT), PDDST(Pervasive Developmental Disorder Screening Test)(4). Treatment of ASD involves Intense Behavioral Therapy, Speech, and Language Development, and educational programs like TEACCH (Treatment & Education of Autistic & Related Communication Handicapped Children) (5). Based on the experience, the latest DSM-5 and ICD-11 development processes offered a further opportunity to not only advance the field in terms of diagnostic utility and validity but also increase compatibility with ICD-11 clinical guidelines and the global psychiatric community at large (6).

There is no mention of a disease that exactly correlates to ASD in the *Samhitas*. Hence it can be considered as an *Anuktha vyadhi*(7). The symptoms of the disease however show similarities to *Unmada*(8). *Unmada*, a disease that afflicts *manovaha srothas,* is characterized by the perversion of intellect, mind, and memory.Here, the condition is more specific to *vata-paithika unmada*. Hence, the treatment involves the consideration of *dosha* and *dooshya* and the development of a protocol for the same.

Case report

A 5-year-old female child was brought by her parents to the Kaumarabhrithya OPD of PNNM Ayurveda Medical College, Cheruthuruthy with a diagnosis of Autism Spectrum Disorder (ASD). She was diagnosed with ASD at the age of 2 ½. The child's mother complained that the child lacked proper conversation skills and eye contact. She moved in and out of the room without any aim. When she gets excited, she would make unusual sounds like 'Ma'.

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History

The patient was born by normal vaginal delivery on full term with a birth weight of 3.1 Kg. There was no history of fetal distress and neonatal jaundice or seizures. She was vaccinated as per schedule. There was no history of maternal infections or use of medications during pregnancy. The mother's age at the time of conception was 24 and her paternal age was 29. Till two years of age, she made noises. After that, only monosyllables were spoken, and she had less eye contact. She started to exhibit problems in mingling with other kids by the time she was 2 years and 8 months old and also started to get regressive. She had a major delay in gross motor, fine motor, social, and language milestones. She would cry when hungry and also has temper tantrums and teeth biting habits. She was taken to a psychiatrist for consultation but was of no use. So in need of better, alternate treatment, she was brought into the Kaumarabhrithya Department of PNNM Ayurveda Medical College.

Clinical Assessment

During the clinical assessment, the child was constantly distracted and restless. She roamed around the room aimlessly. When excited, she would utter a single word 'Ma'. She lacked proper conversation skills but was able to understand and express emotions. She could not recognize colors. She did tasks only by force and without any interest. On neurological examination, higher mental functions were impaired. Personal history revealed a lack of toilet training and bloating on eating gluten-rich food. The patient was found to be of *Vata-Paithika Prakrithi* with *Avara Sara*, *Satva,* and *Samhanana*. Her mental constitution is of *Thamasika* type. In this condition, vitiation of *tridhosha* has occurred, predominantly *vata* and *pitta*. They afflict the *manovaha srothas* and pathogenesis occurred in the *Shirah* (Brain).

Methods

The child was assessed again for the diagnosis of ASD using the Trivandrum Autism Behavioral Checklist (TABC). The child fulfilled the criteria for diagnosis of Autism. The clinical features of ASD before and after the treatment were evaluated using TABC.

Management

The management of the disease condition was purely based on the *Tridosha* principles of Ayurveda

Table 1: The treatment procedure adopted is as below

S.No	Name of formulation	Dose	Frequency	Route of Administration	Duration
1	*Medha gulika*	1 tablet (275 mg)	Twice daily	Orally after food	90 days
2	*Bhunaga Taila*	2 L	Once daily	Shirodhara at morning	90 days
3	*Bhunaga Taila*	2 drops for each nostril	Once daily	Nasyam in the evening	90 days

Table 2: Medha Gulika Composition

S.No	Ingredients	Latin name	Part
1	*Vacha*	*Acorus calamus L.*	75 mg
2	*Sankhapushpi*	*Clitoria ternatea*	75 mg
3	*Yashti*	*Glycyrrhiza glabra*	25 mg
4	*Rudraksha*	*Elaeocarpus sphaericus*	25 mg
5	*Brahmi*	*Bacopa monnieri*	25 mg
6	*Mandookaparni*	*Centella asiatica*	25 mg
7	*Somalatha*	*Sarcostemma acidum*	12 mg

Table 3: Chemical composition of ingredients of Medha Gulika

Sl.No.	Ingredients	Chemical Constituents	Phytoconstituents
1	*Vacha* (9)	Volatile oil, Acorin, Starch, Tannin	CNS Sedative, Neuro tonic, Tranquilizers
2	*Sankhapushpi* (10)	Nervine, Alkaloid	CNS depressant, Tranquilizers, Anti-depressant, Anti-stress Neurodegenerative
3	*Yashti* (11)	Glycyrrhizin, Asparagine, Sulphuric acid, Malic acid	Analgesics, Anti-Allergic, Anti-depressant, Anti-convulsant, Anti-tumor, Sedative, Memory Enhancing activity
4	*Rudraksha* (12)	Alkaloids, Glycoside, Steroids, Flavonoids, Fatty acids	Sedative, Tranquilizer, Anti-convulsive, Anti-epileptic
5	*Brahmi* (13)	Bacoside A, Nicotine, Monnierin	Analgesics, Anti-convulsive, Anti-inflammatory, Anti-tumor, Memorigenic, Nervine, Neurotonic
6	*Mandookaparni* (14)	Hydrocotylies, Astaticoside, Vellarine, Pectic acid, Ascorbic acid, Centric acid, Centallic acid	Anti-depressant, Anti-convulsant, Anti-tumor, CNS depressant, Memorigenic, Narcotic
7	*Somalatha* (15)	Ephedrine(alkaloids)	CNS depressant, Anesthetic, Myodepressant

Table 4: Bhunaga Taila Composition

S.No	Ingredients	Latin name	Part
1	*Bhunaga*	*Lumbricus terrestris*	960 gm
2	*Saireya*	*Strobillanthes kunthiana root*	480 gm
3	*Jal*	*Aqua*	3.072L
4	*Tila Taila*	*Sesamum indicum oil*	768 ml
5	*Bhunaga*	*Lumbricus terrestris*	48 gm
6	*Saireya*	*Strobillanthes kunthiana*	48 gm
7	*Nagara*	*Zingiber officinale*	24 gm
8	*Rasna*	*Alpinia galanga*	24 gm
9	*Lasuna*	*Allium sativum*	24 gm
10	*Devadaru*	*Cedrus deodar*	24 gm
11	*Bala*	*Sida cordifolia*	24 gm

Table 5: Chemical composition of Bhunaga Taila

Sl.No.	Ingredients	Chemical Constituents	Phytoconstituents
1	*Bhunaga* (16)	Nitrogen, Ammonia, Lactic acid Acetic acid, Propionic acid, Butyric acid.	Generally, copper is obtained as satva from Bhunagas. It is used in *Rasayana Karma* and for *Vajikarana* purposes. Satva cures effects of *Sthavara* and *Jangama Visa*
2	*Nagara* (17)	Aromatic Volatile oil, Resin, Gingeol, Starch	Anti-depressant, Anti-convulsant, CNS depressant, Anti-Narcotic
3	*Rasna* (18)	Pluchine, Betaine hydrochloride, Taraxasterol, Quercit,β&γ -Sitosterol, Flavone glycoside, Isorhamnetin	Anti-inflammatory, Anti-tumour, Stimulant, Tonic, Anti-bacterial, Anti-diuritics, Anti-Prostaglandin, Nervine, Aphrodisiac, Anti-spasmodic,
4	*Lasuna* (19)	Allin, Carbohydrate (galactose etc), Vitamins(folic acid, niacin, Riboflavin, Thiamine), Amino acids, Enzymes(alliinase), Thioglycosides, Prostaglandins	Anti-inflammatory, Analgesic, Anti-oxidant, Anti-cholinstense
5	*Devadaru* (20)	P-Methyl acetophenone, atalantone, α&β himachalane, Taxifolin, Himachalol, Cedrinoside	Anti-inflammatory, Anti-septic, Anti-spasmodic, Anti-convulsant, Anti-hyperlipidaemic
6	*Bala* (21)	Ephedrine, Hypaphorine, Vasiscinone, Vasicine, Vasiscinol, Choline	Anti-convulsant, Cerebrotonic, Hypotensive
7	*Saireya* (22)	Terpenoids, Phenolic compounds, flavonoids, Tannins.	Antioxidant, Anti-inflammatory

Observations and Results

The therapeutic benefits of *Medha gulika* [Table 2&3] and *Bhunaga Taila* [Table 4&5] were assessed in terms of changes in the patient's clinical symptoms of ASD at the end of the treatment duration. The patient showed marked improvement in the management of the majority of clinical features mentioned in TABC [Table 6&7]. The patient who earlier had disturbed sleep was found to have sound sleep by the first month of treatment. The severity of the disease also was found to be reduced compared to baseline assessment.

Table 7: Changes in clinical features BT and AT using TABC
Social interaction

		Never		Sometimes		Often		Always	
		BT	AT	BT	AT	BT	AT	BT	AT
a	Inability to establish and/or maintain eye contact				✓	✓			
b	The child does not respond when called, sometimes appears to be deaf						✓	✓	
c	Difficulty in mixing and playing with other children of the same age						✓	✓	
d	Lack of appropriate emotional responses				✓	✓			
e	Can do certain things well, but not the tasks involving social understanding	✓	✓						

Communication

		Never		Sometimes		Often		Always	
		BT	AT	BT	AT	BT	AT	BT	AT
a	Difficulty in comprehension/ communication						✓	✓	
b	May/may not indicate needs by gestures or leading adults by the hand				✓	✓			
c	Echolalia/Using nonsensical words and muttering to oneself	✓	✓						
d	Lack pretend play							✓	✓

Behavioural characteristics

		Never		Sometimes		Often		Always	
		BT	AT	BT	AT	BT	AT	BT	AT
a	Like sameness in everyday routine				✓	✓			
b	Inappropriate attachment to objects				✓			✓	
c	Unusual body movements such as flapping hands, or rocking and jumping						✓	✓	
d	Extreme restlessness, hyperactivity / Over passivity or preferring to be alone all the time						✓	✓	
e	Not responsive to normal teaching methods				✓			✓	

Sensory integration

		Never		Sometimes		Often		Always	
		BT	AT	BT	AT	BT	AT	BT	AT
a	Doesn't like to be hugged or touched / Apparent insensitivity to pain	✓	✓						
b	Intolerance / Addiction to certain sounds, tastes, odours, visuals	✓	✓						
c	No understanding or fear of real danger /Excessive fear for heights, change in position	✓	✓						
d	Enjoys spinning or rotating objects				✓			✓	
e	Inappropriate laughing and giggling / Crying spells with extreme distress for no apparent reasons						✓	✓	
f	Difficulty in fine motor skills / a tendency to fall / clumsiness/ resistance to new motor movement activities	✓	✓						

BT: Responses: Never-1; Sometimes- 2; Often- 3; Always- 4; Scoring: 20- 35 – non-Autistic; 36-43 – Mildly-Moderately Autistic; 44 and above- Severely Autistic; **TOTAL SCORE: 50, Severely Autistic**

AT: Total Score: 42, Mildly-Moderately Autistic; The patient showed minimal improvement upon completion of treatment.

Discussion

Autism Spectrum Disorder (ASD) is one of the most prevalent neurodevelopmental disorders, affecting an estimated 1 in 59 children(23)In DSM-5 criteria, if two core features i.e persistent deficits in social communication and social interaction across multiple contexts; and restricted, repetitive patterns of behavior, interests, or activities are present in an individual, he can be doubted to be autistic. The condition can be typically diagnosed within 3 years of birth by a general lag of developmental milestones. (24). Along with typical symptoms, impaired joint attention, varying verbal abilities like echolalia and pronoun reversal, intellectual functioning varying from mental retardation to superior intellectual functioning in selected areas, lack of theory of mind are additional symptoms(25). The etiology of ASD is multifactorial with strong genetic influence and also linked with neurodevelopmental disorders like seizure disorder, prenatal complications, etc(26). The exact correlation of ASD to an Ayurvedic disease is not available, hence it can be considered as an *Anuktha Vyadhi*. However, the treatment protocol can be developed considering the *doshas*, *nidana,* and *dosha adisthana*. Here, considering the symptoms exhibited by the child, the disease can be correlated to *Vata Paithika Unmada*, afflicting the *manovaha srothas*. The treatment protocol involves *Samana* of the vitiated *doshas*, predominantly *Vata*, located in the *Shirah* with nasal administration and *Shirodhara* using *Bhunaga Taila* and *Medha gulika* for the enlightenment of *Manovaha srothas*. *Bhunaga taila* is a formulation described in Ayurvedic Pharmacopoeia indicated for convulsions, epilepsy, stroke, limited speech. *Bhunaga* (Earthworm), after *shuddhi*, is a rich source of copper. An imbalance in the copper level is

noticed in ASD. Maaaintenance of this level can lead to an improvement in ASD conditions. *Kurinji (Strobilanthes kunthiana*) is useful for alleviating *Vata*. *Nagara (Zingiber officinale*) is having antioxidant, neuroprotective, and memory-enhancing properties and reduces the signs of autism. *Rasna(Alipina galanga)* is also a rich anti-oxidant. *Lasuna (Allium sativum) is* a potent immunomodulator. *Devadaru (Cedrus deodar*) has an alleviating effect of *Vata dosha*. *Bala (Sida cordifolia)* is well known for his *tridosha* pacification.*Thila taila* is best known for its *vata shamaka* property. Hence this combination of drugs in *Bhunaga taila* shows the ability to manage the *doshic* vitiation as well as to act as a rejuvenator of *Manovaha srothas*. The administration of *Bhunaga taila* is in the form of *nasya* as well as *Shirodhara*. As we have noted the vitiation of *manovaha srothas* and the location of *manovaha srothas* to be in the *Shirah*, *Nasya* has a great therapeutic effect as '*Nasa hi shiraso dwaram'*(27)and it directly stimulates the brain and the higher functioning centres. *Shirodhara* is a potent relaxant and anxiolytic and promotes the decrease of noradrenalin, activating immune potential as well as increased peripheral circulation. In Kashyapa Samhita, drugs like *Brahmi, mandukaparni, vaca, satawari,danti*, etc are indicated for licking in an infant are used for improving intellect. Licking of these drugs is said to increase digestive and metabolic power, strength, increase longevity (*ayushyam*), and are said to be auspicious (*mangalam*), virtuous *(punyam)*, aphrodisiac (*vrishyam*), increase complexion (*varnyam*) and eliminate all evil (*grahapaham*)(28). Charakacharya gives more emphasis on Sankhapushpi(29). *Medha gulika*(30), a proprietary medicine is indicated for lack of concentration, loss of memory and grasping power, anxiety, disability in pronunciation, hypertension, fear to face others, pediatric and developmental disorders. Its contents, *Vacha (Acorus calamus), Sankhapushpi (Clitoria ternatea), Yashti (Glycyrrhiza glabra), Rudraksha (Elaeocarpus sphaericus), Brahmi (Bacopa monnieri), Mandookaparni (Centella Asiatica), Somalatha (Sarcostemma acidum*) are *medhya* in nature and hence improve memory and intellect(31). It is taken internally.

The treatment was chartered for 90 days, considering the age and degree of cooperation of the patient. During the treatment, a few difficulties were also faced. The patient being a child was not willing to stay for the complete time of treatment hence the duration of treatment had to be reduced to a few days considering her temperament. She exhibited symptoms of rhinorrhea on a few days for which *Amruthotharam kashayam* was given with 5 mL of lukewarm water for relief and with *Gopichandanadi gutika*. She also had bloating on a few days for which she was administered *Vilwadi Gulika* and *Nirgunyadi Gulika* for alternate days.

After the completion of treatment which lasted for 90 days, the patient showed minimal improvement in symptoms. So, if this protocol is repeated for two or three years, significant changes can be observed in the children suffering from similar symptoms.

Conclusion

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by qualitative abnormalities in social interactions, reduced communication skills, and restricted repetitive behaviors and activities. ASD, being a complex developmental disorder is not completely curable. The main aim of developing a protocol of treatment for a patient suffering from ASD was to manage the symptoms and hence make the patient more social in behavior, thus providing solace to the parents. The treatment was set up by purely considering the *tridosha* basis as the disease is an *anuktha vyadi*. The significance of *medhya rasayana* and *medhya drugs* in diseases of *manovaha srothas* is well established and hence a preparation with such drugs was chosen for giving internally. *Bhunaga Taila* was chosen as the symptoms of disease exhibited predominant *Vata* vitiation. The choice of *nasya* as treatment was based on the fact that *nasa* is the root of *Shirah*. *Shirodhara* was administered considering its affinity to *manovaha srothas*. The study was done with the hope for more studies to be conducted considering the *doshas* in diseases for which an exact protocol is not set for the treatment.

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