

Role of Ayurveda with Multi modal Therapy in Prevention and Management of Autism Spectrum Disorders (ASD): The Whole System Approach

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Abstract

Introduction: Autism is a neuro-developmental ailment seen in the preschool age. It is a lifelong condition and requires long term and multiple treatment interventions.

Aim and Objective: To review and present a possible prevention and treatment protocol on Autism Spectrum Disorder (ASD).

Material and Method: The present study is based on the literature search from Ayurveda compendia, recent pediatric textbooks, articles published in research journals from 1983 to 2019.

Observations and Result: ASDs are the complex diseases with imbalance of *Tridosha* and *Dwimanasdoshas* (fundamental principles of body and mind), based on typical clinical features which match with DSM-V (Diagnostic and Statistical Manual) that can be correlated with *Unmada* (Psychosis/insanity). ASDs can be classified into Autism, Asperger's and Rett's syndrome. The probable etiopathogenesis may be defective organogenesis, brain damage, metabolic or genetic changes.

Discussion: *Acharya* emphasized on *Yuktivyapashray* (rational therapy), *Daiva vyapashray* (non-pharmacological spiritual therapy) and *Satvavajay chikitsa* (Ayurveda psychotherapy) altogether in *Unmad* treatment due to its complex nature. Recently developed therapies such as play therapy and cognitive behavioral therapy-CBT can be a good adjuvant with Ayurvedic management of ASDs for better quality of life.

Conclusion: As no satisfactory treatment is available in modern medicine till now, multi-modal treatment such as Ayurveda, behavioral therapy, physiotherapy, occupational therapy and early educational interventions might be beneficial to treat ASDs effectively. This review paper will be a torchbearer in the prevention and management of ASDs with the whole system approach and proposed management algorithm.

Keywords: Autism Spectrum Disorder, Autism, Ayurveda, Multi-modal Therapy, Unmada, whole system approach, management algorithm.

Introduction

ASDs are the third most common developmental disability which are inadequately understood. They are easily diagnosed by the main differentiating features like lack of interpersonal and communication skills, poor eye contact, delayed speech with pervasive abnormal body movements or posture.^[1]Till 1980, they were uncommon

disorders but recently then umbers are increasing drastically, maybe due to adoption of western lifestyle, prenatal stress, maternal complications, faulty diet and daily regimen. The definite etiology is not known but many environmental predisposing factors may be responsible for the occurrence of these disorders.^[2] ASDs are neuro-behavioral and neuro-developmental

ailment^[3] which can be correlated with *Unmad* described in Ayurveda. *Unmada* is characterized by perversion of mind, memory, desire, behavior and conduct with five varieties.^[4] Management of *unmad* and ASD has need of utilizing multiple interventions including various behavioral and educational strategies^[2,4] repeatedly for long duration. Present review is an effort to interpret and analyze the concept of Autism through Ayurveda perspective along with other multiple interventions which play a synergistic role in its prevention and management.

Material and Method

A retrospective clinical review to evaluate the effect of Ayurveda modalities, modern medicines, association of biochemical parameters, other interventions in ASDs. Method of data Source: Google scholar, MEDLINE (Pub med), Cochrane and Ayurveda were searched from 2010 to 2019. Manual search was also done to access the articles or thesis wherever possible. Electronic search included the following key words search to find the clinical studies with use of MeSH terms- Double blind study, "Ayurved*" AND/OR autism, Autism Spectrum Disorder, clinical trials, RCT, meta-analysis, systematic review, the diagnostic tests and interventional study which were reviewed thoroughly. Inclusion Criteria a) randomized clinical trial. b) Published in English accessible in full text. c) Evaluated on the effect of autism prevention and management or treatment.

Observations and Result

Many complex signs and symptoms are present in clinical features of ASD such as behavioral problems, screaming, developmental delay in all milestones i.e. gross motor, fine motor, personal-social and language. Such patients have strong interests in irrelevant things (like rope), mood-anxiety disorder, obsessive-

compulsive disorder, gastro-intestinal upset, mental retardness, phobia, sleeplessness, etc. Imaginative play, communication and social interaction severely lack in ASDs. ASDs are classified into Autism, Asperger syndrome, Rett syndrome, Pervasive developmental disorder (PDD) and Childhood disintegrative disorder (CDD) mentioned in table no 1.^[2]

Some investigations such as Karyotyping, DNA, IQ test etc. help to rule out differential diagnosis and hidden associated features. In particular, diagnosis of ASDs are based on DSM -V criteria, typical clinical features, examination and history with so many other assessment scales such as ADI-R Autism diagnostic interview-Revised; ADOS-G-autism diagnostic observation schedule generic; CARS- childhood autism rating scale; DISCO-10: diagnostic interview for social and communication disorders-tenth revision; GARS-2: Gilliam autism rating scale; 3 Di: Developmental, dimensional and diagnostic interview.^[17]

Samprapti: The probable etiopathogenesis is based on faulty organogenesis, brain damage, trauma, obstructed labour, metabolic changes in intra-uterine life. ASDs may be caused due to genetic predisposition or defects, radiation, pollution, *Dushivishasevan* (food with toxic elements), improper use of food and medicines. Environmental triggers like stress during ANC, perinatal and postnatal insults, *Vega Dharna* (suppression of natural urges) and other known or unknown reasons may provoke the disorder. It is a *Tridoshajvyadhi* with variation in their single or mix dominance, also vitiates *Mansik Doshas*. They together affect *Buddhi*-intellect (*Dhee*-short time memory *Dhru*-act with dedication, *Smruti*-memory) and create various clinical features especially abnormal pervasive movements, screaming suggesting ASD^[4,18] An attempt has been made to correlate treatment of *unmad* with features of autism in table no. 2

Table no 1: *Doshaj* variance matching with ASD features with Ayurveda management^[2,4,19]

| SN | Type | Characteristic features | Resemblance to Autism | Shaman therapy/ Pharmacotherapy | Shodhan (bio-purification Therapy) |
|----|--------------|---|--|--|------------------------------------|
| 1 | Vataj Unmada | Sudden abnormal laughing, crying, talking, body movements | Repeated movements of eye brow, lips, chin, hands-feet and other organs, Frothing of saliva, Excessive screaming, dancing, singing, Frequent utterance of uncontrolled sound and voice | <i>Deepan-pachan-Anuloman</i> , <i>Snehpan</i> , <i>Medhyakalp</i> , <i>Sandnyaprabodhan</i> , <i>Ashwasan</i> /assurance <i>Saraswatarishhta</i> , <i>Unmdgajakesariras</i> with milk, <i>Ghrit</i> | Mrudurechan, Basti, Nasya |

| SN | Type | Characteristic features | Resemblance to Autism | Shaman therapy/ Pharmacotherapy | Shodhan (bio-purification Therapy) |
|----|-------------------|--|--|---|------------------------------------|
| 2 | Pittaj Unmada | Impatient, irritable, aggressive, demanding food and water | Aggressive behavior, Irritable, recurrent fever, Harsh high pitch screaming | <i>Trasanchikitsa</i> & above all | <i>Mrudu-rechan, Basti,</i> |
| 3 | Kaphaj Unmada | Limited talk & movements, sleepy, drooling of saliva | Stay in one place or spot, less -talkative, clumsiness, less mobility. Drooling of saliva, running nose, dislike for bathing and toileting | Same asabove | Snehan-Swedan, Vaman, Virechan |
| 4 | Sannipataj Unmada | Mixed features | Mixed features | Same asabove <i>Doshaj</i> treatment | As per dominance |
| 5 | Agantuj Unmada | Extraordinary behavior in knowledge & strength | Sudden grief, loss/separation of close relative, brain trauma etc. Features seen of <i>Vataj</i> and <i>PittajUnmada</i> mainly | <i>Ghritkalpa, Nasya, Ashwasanchikitsa</i> , counselling sessions | -- |

Prevention: *Acharya Charak* has suggested implementation of pre-conceptional *Shodhan* and *Rasayan* (rejuvenation therapy) for newly wedded couple. He also advised genetic counselling, consanguinity check, pursue daily regimen, seasonal regimen and *Yoga*. While during pregnancy, adoption of *Garbhiniparicharya* (antenatal checkup), fulfillment of *Dauhrida* (desires during pregnancy), avoidance of *Garbhopaghatakara Bhavas*, stress (detrimental factors affecting fetus) are some measures that play the pivotal role in prevention of ASDs.^[20,21] *Pathya* (dietary restrictions) and *Nidanparivarjan* (restricting causative factors) are dynamic in etiology with abundance of *Satvavajaychikitsa* (mind control therapy), *Achar Rasayan* and *Sadvritta* (good conduct) to control *Niyamak Buddhi*. These factors are essential for prevention of *Pradnyaparadha* (intellectual blasphemy), *Asatmendriyarthasanyog* (incompatible contact of sense organs with their objects) and *Parinama* (time factor for chronological error)^[22] which are three basic causes of all diseases. Prevention is easy and better dealt with Ayurvedic interventions than management.

Algorithm of ASD Treatment proposal: As both *Sharirikas* well as *Mansik Doshas* are involved in etio-pathogenesis hence multi modal treatment approach is necessary for the whole system correction.^[23] Initiating with *Yuktivyapashraychikitsa-YC* (rational

therapy), medicines having *Deepan* (appetizer), *Pachan* (digestive) and *Anulomak* (mild laxative) properties must be added because *Agneemandya* (poor appetite, digestion & metabolism) is essentially present with *Vatadushti*. Coherent use of *Yuktivyapashraychikitsa* which mainly comprise *Shaman* (pharmacotherapy), *Mrudu Shodhan* (purify and detox therapy) and *Rasayan* (Rejuvenation therapy) along with multimodal treatment approach can play a vital role in the management of ASD.^[15, 24-25]

Medhyaghritkalp: As the main involved site is brain hence any *Ghritkalp* fortified with *Medhyadravyas* (Ghee with nootropic/intelligence boosting medicines, such as *Bramhighrit, Kalyanakor Guduchyadi-Bhringrajadighrit* etc.^[26]) is very important in prevention and treatment. *Medhyashamanaushadh/* nootropic medicine's action is synergistic to *ghritkalpa* with *Balya- brihan & Rasayan* (General tonic for rejuvenation) efficacy.^[27]

Panchakarma-Poorva Karma: Pre-procedures such as *Rukshan, Deepan, Pachan* and *Snehan-svedan* are important for facilitation of *Pradhankarma* (main procedures). Long term and repeated use of some procedures like *Talapothichhil/Shirolepa, Shirodhara, Udvartan, Udsadan, Annalepan, Patrapottali, Pindasweda, Kwathdhara, Takradhara, Kanjidhara* or

Tailadhara etc are beneficial to pacify ASDs for better efficacy. Multiple sittings of these procedures are required to treat ASDs due to its complex nature.

Pradhan Karma: *Nasya, Basti-Niruh, Matrabasti* are mainly beneficial in all types of Autism. As per *Doshaj* predominance *Vaman* and *Virechan* can be used.

Paschat Karma: *Sansarjankrama* (light diet therapy), followed by *Balya-brihan* & *Rasayan* therapy (anabolic action) is recommended.^[28]

Satvavajayachikitsa: It comprises the act of controlling mind which can be achieved by doing *Buddhinyaman* to avoid committing basic causes of all diseases^[29], *Sadvritta, Achar Rasayan* and *Trasan* (act to deviate mind by frightening or eliciting painful stimulus).^[19] *Yoga*, meditation and its other modalities are also helpful in achieving positive results in autism.^[30]

Daivyapashraychikitsa: It includes non-pharmacotherapy with spiritual belief which provides assurance and due to its psychological impact on mind, such measures can be useful to treat psychiatric illness to some extent.^[19] It synergistically acts with or without main treatment for a particular disease like Mantra chanting, use of amulets, holding therapy etc.

Multi-modal treatment such as, counselling of parents for tackling children affected with ASD, play therapy, Cognitive behavioral therapy, applied behavior analysis, Yoga, Speech therapy, Occupational therapy, Physiotherapy, Music therapy, Hydrotherapy, Reiki etc. can be incorporated as whole system approach^[23].

There is no comprehensive management available in any system but synergistic action of these therapies altogether may prove better quality of life. Hence, a hypothesis of treatment guideline is framed to resolve this issue with the whole system approach for ready reference to Ayurveda physicians to treat ASDs effectively.

Discussion

(a) Key of preventing ASDs: It is necessary to prevent ASDs by strictly adapting daily and seasonal regimen, CAM-complementary and Alternative medicine-Yoga-meditation, recreational activities to keep away stress, pre-conceptual *Shodhan* and no consanguineous marriages to prevent mutational genetic changes *Beejdushti, Vatadushti*, and *Agneemandya*^[15,25] All other etiological factors

should be avoided with happy gestational period to boost *Satva* and balance *Raja-Tama*.

(b) Rationale of Shodhana Therapy: *Shodhan* 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.*^[39,24] In Autism, mainly *Nasya* and *Basti* are more important procedures as *nasya* stimulates the function of brain and all *urdhvajatrugat* organs.^[28] *Basti* is the main pathway of the gut-brain axis to pacify the vitiated *Vata* and stimulates brain function.^[32] 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.^[33] In table no 4, there is a description of pre and main *panchakarma* procedures with their mode of action and references.

(c) Rationale of Shamana therapy (Internal medication): The process by which vitiated *Doshas* subside and return to normal without creating an imbalance of other humours is known as *Shamana*. This treatment is achieved by the use of appetizers, digestives, *Rasayanas*, symptomatic treatment, exercise etc.^[19]

(d) Rationale of Diet therapy: It 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.^[40]

(e) Role of Nidan Parivarjan: It is to avoid the known disease-causing factors with respect to diet, environmental issues and lifestyle of the patient. It also encompasses the idea to refrain from precipitating or aggravating factors of the disease.^[19]

(f) Role of Rasayana therapy: It deals with the promotion of strength, vitality, immunity against the disease.^[38]

(g) Role of Satvavajaya: It is an Ayurvedic psychotherapy. *It concerns mainly with the area of mental disturbances which includes restraining the mind from desires for unwholesome objects and intellectual blasphemy in collaboration with good conduct.*^[29]

(h) Role of Daivyashray Chikitsa: It was a proven

therapy since time immemorial but since medieval period it declined drastically due to the influence of modern medicine. Not many studies have found to prove the scientific role of its various components. Some randomized controlled trials (RCTs) of music interventions for ASD have reported positive effects of music on emotional engagement, social interaction, communication and parent-child relationship.^[13,40]

- (i) **Role of Multi-modal Treatment and Whole System Approach:** It aims to evaluate the outcome of disease related to multiple variables individually.^[23] It is an emerging approach for a complex disease management. It is not possible to fully understand the role of each component individually of whole system approach when implemented together.

Conclusion

Multi-modal treatment facilitates synergistic action for good outcome in ASD. Long duration is required to correct the whole system which gets impaired due to multifaceted nature of the disorder. Each course of these therapies either separate or together as per the symptoms and tolerance, magnify steady results in terms of sensory, motor integration, immunomodulation and ability of verbal communication. *Satvavajaychikitsa* is a broad term which may comprises all other multi-modal treatments those are developed separately nowadays. Thus, the three main *Chikitsa* modalities of Ayurveda-*Yuktivyapashray*, *Daivavyapashray* and *Satvavajay* are stepping stones in the management of ASDs (which is a life-long condition), giving a ray of hope and indicating the need towards more research in this arena. *Agneemandya* and *Vatadushti* are most important cause of ASD and should be eliminated. By implementing need-based modalities with multi-dimensional and wholistic approach, Ayurveda plays a fundamental role in not only its prevention but also in management, with improvement in quality of life to much extent.

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