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### RESEARCH ARTICLE

#### MANAGEMENT OF COGNITIVE DEFICIT THROUGH AYURVEDA

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#### Abstract

Pursuit for healthy offspring has been mentioned as one of the feats of human life. Several neuropsychiatric conditions associated with children are recorded every year one of which being Cognitive deficit. There is no direct correlation of Cognitive deficit in Ayurveda but it can be correlated with Jadatwa, Jada or Jadyata on the basis of similarity in symptoms. Having no cure for such mental conditions they can only be effectively managed by utilizing herbal medicines, lifestyle, dietary regimen, Rasayan and Panchkarmatherapies mentioned in Ayurvedic texts to promote healing of body, mind and soul. Ayurveda also focuses on preventive measures for healthy progeny. These therapies not only improve quality of life but also relieves the physical, mental and social stress of the custodian. This paper aims at highlighting the picture of Cognitive deficit in children as well as critically analyses the vast treatment options in Ayurveda. Each plant is discussed separately with special reference to their relation with Cognitive deficit (Mental retardation) along with the therapies and prophylactic measures that can prove to be successful in the management of Cognitive deficit. The material for this article was searched at PubMed, Google scholar, Ayurvedic texts and cross-referencing of previous articles was done. Articles published in English language within last 22 years were referred to write this review article.

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#### Introduction:-

Among all the seasons of life, Childhood is the most influential and important phase in a person's life. Events that happen during childhood can have a direct impact on how we feel and behave as adults. Earlier only physical health was considered as a marker of health but nowadays we are well aware that mental health plays a crucial role in one's life. Our brain development starts from foetal life to the adolescence. Only healthy minds carry positive attitude everywhere so it is very important to take keen interest in child's mental health. According to the American Association on Intellectual and Developmental Disabilities (AAIDD), ID is characterised by limitations in intellectual functioning (reasoning, learning, problem solving) and adaptive behaviour (conceptual, social and practical skills) that originates before 18 years of age. [1] Intellectual disability previously known as mental retardation is often associated with other psychiatric conditions such as Cerebral palsy, Down's syndrome, Autism, Attention deficit hyperactive disorder (ADHD), and other emotional and behavioural disorders in children. About 2-3% of

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children have an IQ below 70 in general population. About 4 per 1000 of the general population are more severely handicapped with an IQ below 50.[2] There are always great challenges to surviving and thriving in life and some regions face greater challenges than others, like childhood. Also, Cognitive disabilities may overshadow other psychiatric conditions in children, preventing accurate diagnosis of coexisting conditions. There is no evidence of direct correlation of Cognitive Deficit in Ayurveda. Still some terms like Jadata, Jadya sound similar to intellectual disability on the basis of similarity in symptoms. Diagnosis as well as treatment of such mental conditions remains a challenge. So far there is no cure for such intellectual disabilities however it can be effectively managed by medications, counselling, day care etc, but side effects always mimic allopathic medicines as well as the 'quick fix' nature of medicine can lead to diminish the efficacy eventually. Also, the condition of drug resistance cannot be ignored.

Ayurveda brings a beacon of hope in this context. The principles of Ayurveda have always proved to be a boon for the mankind. Ayurveda provides a holistic healing approach that ensures that the problem is removed from the root rather than just targeting symptoms. This era provides potential opportunity for the Ayurvedic physicians to explore the Ayurvedic principles for the benefit of mankind.

### **Cognitive Deficit Statistics**

The exact prevalence of intellectual disabilities in India is not known. India has the world's largest child population who are at a higher risk of developmental disabilities.[3] These demographic and geographic factors influence awareness of ID, its prevention, health care, and rehabilitation services, which further impact its incidence and prevalence. In various studies prevalence of mental disorders among children has been reported to be 14-20%.[4] According to world health report (2000), 20% of children and adolescents worldwide suffer from a disabling mental illness.[5] In India, highest prevalence of intellectual disability was found to be between 5-35 years. Overall cumulative prevalence of ID was estimated to be 10.5 per one thousand in an epidemiological study conducted in India.[6] In India, the prevalence of individuals with MR according to the 2011 census was reported as 5.6%, but further age stratification is unavailable.

### **General Line Of Management**

Cognitive deficit must evidently, be understood and diagnosed as a developmental disorder. The treatment not only aim to cure the disorder rather, efficiently manage the skills and behaviour of the child. The management is predominantly nonmedical, involving education to achieve maximal learning potential, Habilitation, Vocational training and Normalization of social and recreational activities in accordance with the norms and rules determined by society. [7] The treatment aims to develop the child's potential to the fullest. Efforts should be made to make the child's life as independent as possible. Parents should be counselled and advised for minimal criticism and high appreciation. Special education and training should begin at day care centres and schools as early as infancy. This includes social skills to help the person function as normally as possible. It is important for a specialist to evaluate the person for other physical and mental health problems. People with intellectual disability are often helped with behavioural therapy.

### **Ayurvedic Correlation**

In Ayurveda Cognitive deficit can be categorized under Janma Bala Pravrttyadhi (congenital ailments) which presents as the impaired mental functions with or without physical disabilities in children. Ayurvedic literature has not mentioned Jadya as a separate disease entity but throws light on the aetiology, presentation, along with prophylactic and some specific measures for the management of such mental ailments in the context of terms like Jada/Jadyata. The word Jadata mentioned in Ayurvedic texts can be correlated with mental retardation including mental subnormally and related disabilities. [8] Amarkosha mentioned this word for idiocy and originates from the root "Jadati Ghani Dhawanti". [9] A Jada person cannot differentiate between good and bad or feeling of happiness and sorrow. Sir. M. Monnir Williams in his dictionary mentioned the word Jada as cold or rigid and has been referred in the context of idiocy, stupid or unintelligent. [10] Ramharsh Singh in his book Ayurvediya Manas Vijana has mentioned Amedhata as the state of mental deficiency, the description of which stimulates Jadata. He considers Amedhata as a psychiatric illness under the category of Manas prakrtivikaras in the classification proposed by him Nagesh Bhata in his work "Paribhasendushekhara" correlates Jada with ox or bull. [11] Acharya Kashyapa in Phakkargachikitsa states that when a multigravida woman with Vata or Pitta predominant endowment with Lavana rasa pradhana breast milk or Tridosha milk feeds an infant the child becomes lame, dumb and idiot or Jada. [12] According to Astanga Hridaya, consuming Vata aggravating substances during pregnancy ultimately leads to hump, blind, idiot (Jada) and dwarf child. [13] Acharya Sushruta states that the variety and quality of the life of an

individual is predominantly due to the actions of his past life i.e, Purvajanamkrit karmas.[14] Acharya Sushrut has mentioned features of Matsyasatwa as Anavasthitchitta, Maurkhyas.[15] Acharya Charak opines that Vayu is responsible for the anomalies in Garbha[16]

### **Ayurvedic Management**

Ayurveda emphasis on physical as well as mental health. Acharya Sushrut describes definition of health as Prasannaatma, Indriya, Mana [17] which highlights the importance of mental health. Various Medhyadravyas and other related formulations like Rasayanas in combination or as single drugs have been described in Ayurvedic texts for the management of Jadata and allied conditions.

### **Prophylactic**

#### **Garbhini paricharya:**

general and specific month wise dietary regime during pregnancy for normal and uncomplicated delivery of healthy child must be followed.[18]

### **Fulfillment of Dauhridyadesires-**

Acharya Sushrut indicates to fulfil the desires of mother during 4th month of intrauterine life, unfulfillment of Dauhridya desires or inadequate nutrition produces the abnormalities like humpbacked, crooked arms, mental subnormality, dwarfism dysshapeeye in the fetus.[19] Acharya Charak also mentions that unfulfillment of Dauhriddesires may lead to vitiation of Vatadosha resulting in multiple congenital anomalies and mental subnormality (garbhvinash and virupta) in the fetus.[20]

### **Avoiding the Garbhopaghat Kar Bhavas:**

Acharya Charak has advocated to avoid various Aaharaj, Viharaj, Mansik factors otherwise they may lead to abortion or birth of a child with multiple congenital anomalies and psychological disorders including Jada.[21]

### **Jatakarma samskara:**

Acharya Charak has mentioned the use of Madhu and Ghrita right after birth in the form of Lehana [22] and Acharya Sushruta advocated administration of Madhu, Ghrita and Suvarnaas Jatakarma Samskara.[23]

Acharya Charak has mentioned the properties of Ghrita as- Smriti, Buddhi, Agni vardhanam[24]

### **Swarnaprashan:**

Acharya Kashyap has introduced the concept of Swarnaprashan in Lehadhyaya. It increases the Medha (intellect), Agni (digestive power), strength, vitality and Bala (immunity).[25]

These principles can be followed to prevent conditions like cognitive deficit in children.

### **Therapeutic**

Ayurvedic classics have given elaborate description, for the management of Jada and other related mental disorders. Use of various Medhya drugs and other compounds can promote the level of intellect.

**Medhyarasayanas** mentioned by Acharya Charak - Mandukarni, Yashtimadhu, Guduchi, Shankhpushpi improves memory, concentration, grasping capacity.[26]

**Rajat bhasma**-Ras Vagbhatt in his book Ras ratnasamucchyam mentioned the properties of Rajat Bhasma as Medhya, Balya, vata har, Rasayan, Sarva rog har.[27]

**Samvardhanghrita** by Acharya Kashyap is indicated for Pangu Muka Ashruti Jada.[28]

**Suvarna Bhasma, Go Ghrita, Madhu, Vacha, Kushtha** are Medha, Buddhi, Bala Vardhak according to Acharya Sushrut.[29]

Intellectual disability in Ayurveda indicates towards Vata Pradoshaja Vikara (Vata- Doshais responsible for movement and cognition). As the root seat of pathogenesis is higher centers, in such cases Shiroabhyanga (Head massage), Shirodhara (streaming of medicated liquid over forehead), Shiropichu (keeping sterile cotton pad dipped in medicated oil over bregma), Shirobasti (retention of medicated liquid overhead), Abhyanga (Therapeutic massage), Basti (Therapeutic enema) and Nasya (Errhine therapy) may prove to be useful.

**Shirodhara**

Tridoshas, Trigunas and Manovahastrotasare consequently effective in improving memory with other Cognitive processes. Shirodhara had shown efficacy in all areas like working memory, processing memory, visualization, and visulmotor skills. [30]

**Nasya**

The drug given through the nose as Nasyaenters the brain and removes only the morbid Doshasresponsible for creating the disease. An article on the effectiveness of BrimhanaNasya in psychosomatic disorders showed that Nasya is a drug delivery port to the brain and intranasal delivery of medicine bypasses the blood brain barrier to target the central nervous system, which reduces drug systemic exposure thus reducing side effects. Stress and the brain are closely relatedto each other, separating stress from the root can prevent psychosomatic disorders and provide nourishment to the brain. [31]

**Basti**

According to the aetiology of Jadyata, Vata is mainly responsible for such mental ailments and as per Acharya Charak, there is no medicine other than Basti to subside the KupitaVata.[32]

**Drugs Related To Cognitive Deficit****Endri (Bacopa monniera)-**

Endriis a well-known nootropic plant reported for its memory enhancer, [33] sedative action [34]and cognitive enhancer actions.[35]

**Guduchi (Tinosporacordifolia)-**

Guduchi has been claimed to possess learning and memory enhancing properties [36] and antistress activity. [37] Tinospora cordifolia enhanced the cognition in normal and cognition deficits animals in behavioural test Hebb William maze and the passive avoidance task.[38] Mechanism of Cognitive enhancement is by immunostimulation and increasing the synthesis of acetylcholine, this supplementation of choline enhances the cognition.[39]

**Jatamansi(Nordostachysjatamansi)-**

It is used for medicinal purposes as it is Bhutaghna or ManasaDoshahara (relieves of psychiatric problems) and Medhya.[40] Rhizomes contain a terpenoid ester, nardostachysinI.[41]

**Mandukparni(Centella asiatica)-**

Its fresh whole plant juice is used for therapeutic purposes as Medhya (Cognitive enhancer)[42]brain growth promoter. [43] Dendritic arborization is supposed to be the neuronal basis for improved learning and memory. [44]Centella asiatica inhibits the memory impairment induced by scopolamine through the inhibition of AChE. [45]

**Shankhapushpi (Convolvulus pleuricaulis Chois)-**

Highly regarded as Medhya (intellect promoter). [46] Ayushman-8 (containing Shankpushpi, Brahmi and Vacha) reported it to be effective on Manasamandata (mental retardation).[47]

**Vacha (Acorus calamus)-**

Rhizome is useful part having Medhya quality. It has been used in Indian and Chinese system of medicine for hundreds of years to cure diseases especially the central nervous system (CNS) abnormalities. [48-51]

**Yashtimadhu (Glycyrrhiza glabra)-**

Liquorice has significantmemory enhancing activity in dementia, [52] it significantly improved learning and memory on scopolamine induced dementia. The roots and rhizomes of Glycyrrhiza glabra is an efficient brain tonic; it increases the circulation into the CNS system and balance the sugar levels in the blood. [53]

**Clinical Evidences Related To Cognitive Deficit**

- 1.Brahmi Ghrita and Jyotishmati Tail were found to be effective in alleviating the symptoms of Cognitive deficit in patients of Borderline Mental Retardation. [54]
- 2.Jyotishmati was found to be Intellect promoting, showed beneficial effect on the learning and memory process in mentally retarded children.[55]

- 3.The aqueous extract of seeds of Jyotishmati was found to be helpful in improving learning and memory in rats.[56]
- 4.Children suffering with Cognitive deficit when administered KalyanakaGhrita for a period of 90 days showed significant improvement in cognitive ability without any adverse effects.[57]
- 5.Jatamansi is proven to improve learning and memory in mice. [58]
- 6.Few investigations reports on Shankhpushpi suggest that it has potent depressive action in mice. [59]

### Discussion:-

Intellectual disability (ID) involves problems with general mental abilities that affect both intellectual functioning (such as learning and reasoning) and adaptive functioning (activities of daily living conceptual, social, practical skills). Ayurveda shows a ray of hope to improve the quality of life with better life expectancy of children with cognitive deficit. Medhya drugs are known to have specific effect on mental performance by producing neuronutritive effect and improve brain metabolism. Vatadosha being the root cause as per Ayurveda can effectively be managed by Medhyadravyas, Ghrita and Panchkarma procedures. Drugs like Jyotishmati, Endri, Guduchi, Jatamansi, Yashtimadhu are proven to have nootropic effects with several experiments. After analysing the probable mode of action of various drugs and therapies it is clear that these medications have great role in the management of Cognitive deficit without any side effects. So, there is a need of prolonged therapy with faith and patience for satisfactory results and not giving up after few visits.

### Future Scope

More researches with large sample size and multicentric approach should be performed for more accurate statistical data. Studies with Randomized clinical control trial and black box design can be done with various Medhya (nootropic) and Rasayan (rejuvenating) drugs like Saraswat ghrita, Samvardhanaghrita, Panchgavyaghrita, Kalyanaghrita, Medhyarasayan along with various Panchkarma procedures. Prevention of cognitive disabilities can be done by following specific regimens described by ancient Acharyas.

### Conclusion:-

Ayurvedic approach in this field is preventive, rehabilitative and is particularly helpful for management and prevention of such deficits. Psychiatry finds prominent space in ancient classical practice of Ayurveda. The ayurvedic management is entirely health oriented rather than disease oriented. The main aim of management is to teach appropriate life skills, promote functional and psychological independence, facilitate intellectual and adaptive functioning thus improving overall health condition and quality of life. There is a scope of utilizing Ayurvedic approach and therapeutics as an adjunct to the disease oriented modern therapy for the management of Cognitive deficit in children.

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