

Managing Symptoms of Substance Use Disorder with Nasya and Ayurvedic Medicines: A Case Study

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ABSTRACT:

A substance use disorder (SUD), also known as a drug use disorder, is a condition in which the use of one or more substances leads to a clinically significant impairment or distress. Dependence and Addiction are components of a substance use disorder and addiction represents the most severe form of the disorder. A 21-year-old male patient visited the OPD of department of *Panchkarma*, Rishikul Campus, Uttarakhand Ayurved University, Haridwar with the complaints of craving for Substances (cigarette, weed, alcohol), suicidal tendency, irritability, pain and numbness in bilateral lower limbs and hopelessness for about 1 month. According to the patient, all these symptoms appeared after withdrawal of Substances (Cigarette & Bidi). He was diagnosed under the category of Nicotine Based Substance Use Disorder after screening. Ayurveda considers Substance Use Disorder under the topic of *Dushi Visha* (cumulative poisons), which means a type of toxin which remains inside the body for long and then produces various ill effects on body. He was given *Nasya* with *Brahmi Ghrita* and Personified Ayurvedic Formulation (self-made formulation, made up of powders of *Medhya Dravyas*) in the dose of 3 gms twice a day before meals for a period of 12 weeks. Follow-up was done during and after treatment. Improvement was seen in all the symptoms. Hence, it can be concluded that Comprehensive Ayurvedic Management is effective in this emerging challenging disease of Substance Use Disorder.

KEYWORDS: Addiction, *Brahmi Ghrita*, *Nasya*, Nicotine, Substance Use Disorder.

Received: 30.08.2022 Revised: 11.09.2022 Accepted: 25.09.2022 Published: 03.10.2022

Quick Response code



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INTRODUCTION:

A substance use disorder (SUD), also known as a drug use disorder, is a condition in which the use of one or more substances leads to a clinically significant impairment or distress. Dependence and Addiction are components of a substance use disorder and addiction represents the most severe form of

the disorder. ^[1,2] Drug dependence on a substance develops when the brain's neurons adapt to repeated drug exposure and only function normally in the presence of the drug. When the drug is withdrawn, several physiologic reactions occur. ^[3] Dependence often leads to addiction. Addiction is defined as a chronic,

relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences. The term Addiction is equivalent to severe substance use disorder as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5, 2013). [4] According to W.H.O, psychoactive substance use poses a significant threat to the health, social and economic fabric of families, communities and nations. The extent of worldwide psychoactive substance use is estimated at 2 billion alcohol users, 1.3 billion smokers and 185 million drug users. Mortality rate of tobacco addicts worldwide is 8.8%, alcohol users 3.2% & other illicit drugs 0.4%⁵. Disability adjusted life years or percentage of total years of life loss of tobacco addicts is 4.1%, alcoholics 4.0% and other illicit drugs 0.8% [5]. Among all other substance use disorders, the most common and prevalent substance used is Nicotine. According to W.H.O GATS-2 India 2016-17, 28.6% of adults aged 15 and above used tobacco in any form. 19.9 crore adults in rural areas and 6.8 crore adults in urban areas use tobacco. Every fifth adult uses smokeless tobacco and every tenth adult smokes tobacco [6]. Ayurveda considers Substance Use Disorder under the topic of *Dushi Visha* (cumulative poisons), which means a type of toxin which remains inside the body for long and then produces various ill effects on body. Treatment mentioned by *Acharya Charaka* of *Dushi Visha* in *Chikitsa Sthana*, 23rd chapter is *Nasya Karma* [7].

CASE REPORT:

A 21-year-old male patient visited the OPD of department of *Panchkarma*, Rishikul Campus, Uttarakhand Ayurved University, Haridwar with the complaints of craving for Substances (cigarette, weed, alcohol), suicidal tendency, irritability, pain and numbness in bilateral lower limbs and

hopelessness from past 1 month. History of present illness reveals the patient was asymptomatic before 2 months and all these symptoms appeared after withdrawal of Substances (alcohol and cigarettes filled with weed). Family History was not present. There was no history of diabetes, hypothyroidism, and hypertension. He was diagnosed as a case of substance use disorder on the basis of Signs and Symptoms and relevant examinations. Clinical Findings reveal weight was 72kgs, height 160cms, blood pressure 146/100 mm of Hg and pulse rate 78/min. Personal history revealed that he had reduced appetite, bowel was not clear without cigarette use, frequency of urine was normal and sleep was disturbed with abnormal psychological thoughts. His physical and systemic examination didn't reveal any abnormal findings.

Ashtavidha Pariksha done and found *Nadi-Vata-Pittaja*, *Mala-Kathina*, *Mootra-Samanya*, *Jeehwa-Malavritta*, *Shabda-Samanya*, *Sparsha-Samoshnasheeta*, *Driga-Samanya*, *Aakriti-Madhyama*

Diagnostic Criteria:

Following criteria was taken into consideration on the basis of associated signs and symptoms & grading was done from 0 to 4 depending upon severity. Various symptoms were present from 1 month since the withdrawal of substance: These were Craving for Substances, Irritability, Anger, Anxiety, Difficulty in concentration, Mouth sore, Constipation, Restlessness/Impatience, Increase appetite, Depression/ Sadness, Tension, Dreams, Frustration and Psychological need.

The Grading for these Symptoms was done as:

Grade 0 Signifies No Symptom present= Absent, Grade 1 = Mild = Twice a day, Grade 2 = Moderate = Four times a day, Grade 3 = Severe= Five to Six times a day, Grade 4 =

Extremely Severe = Continuously & hampering daily routine.

Also, Fagerstrom test for Nicotine Dependence, Hamilton Anxiety Rating Scale & Hamilton Depression Scale were taken into consideration (according to DSM-5).

Written consent was taken from the patient about the treatment procedure.

MATERIAL & METHODS:

Procurement of drugs:

Raw drugs for the formulation of *Brahmi Ghrita* were collected from Pharmacy, Sidcul Haridwar and *Brahmi Ghrita* was made in that pharmacy. Also, for the Personified Ayurvedic formulation (Nicofree Powder), raw drugs were collected from Pharmacy, Sidcul, Haridwar and were converted to powder form.

Formulation of *Brahmi Ghrita* (as per *Sharangdhara Sneha Paka Vidhi*):

1. *Brahmi* is in highest proportion in this formulation (16 parts of *Svarasa* + 1 part in *Kalka* = 17 parts).
2. Cow's ghee is taken as formulation media which has a specific property of '*Samskara anuvartana*' means it follows the properties of drugs with which it is formulated. (It is taken in 4 parts).
3. All other three drugs are in proportion of 1: 4 ratios each to that of *Brahmi*. (*Shankhpushpi* = 1 part, *Kushtha* = 1 part, *Vacha* = 1 part)

MANAGEMENT:

***Brahmi Ghrita*:** Patient was given *Shodhana Nasya* of *Brahmi Ghrita* for 1 week followed by a gap period of 2 weeks. Total 4 sittings of *Nasya Karma* were given with 2 weeks gap after every sitting. The dose of *Nasya* was 8 bindu (1 bindu = 0.5 ml) in each nostril.

***Kala of Nasya Karma*:** *Nasya* was given empty stomach in the morning in between 7-8 a.m.

Personified Ayurvedic Formulation:

Powder of some *Medhya dravyas* (*Brahmi* (*Bacopa monnieri*), *Shankhpushpi* (*Convolvulus pluricaulis*), *Jatamansi* (*Nordostyche jatamansi*), *Ashwagandha* (*Withania somnifera*), *Sarpagandha* (*Rauwolfia serpentina*) & *Guduchi* (*Tinospora cardifolia*)) was made with equal proportion of all drugs and given in the dose of 3gms twice a day with Luke warm water before meals for entire course of study i.e. for a duration of 12 weeks.

Follow-up: It was done on day 0, 21, 42, 63,84 i.e. (BT, F1, F2, F3, AT) respectively.

OBSERVATIONS AND RESULTS:

Observations were drawn on the basis of under given subjective parameters grading which are done before and after the treatment.

1. Subjective Parameters (Based on associated Signs and Symptoms)

Subjective parameters like craving, pimples, headache, mouth sores, constipation, frustration and psychological need for the substances were completely relieved after completion of treatment. Also, in all other symptoms, there was marked improvement.

2. Fagerstrom Test for Nicotine Dependence: The above test is taken from DSM-V.
Before treatment, Grading was 10 and after treatment, score was reduced to 01.
3. Hamilton Anxiety Rating Scale (HARS) & Hamilton Depression Rating Scale (HADS):

The Grading of both Hamilton Anxiety Rating Scale(HAR-S) and Hamilton Depression Rating Scale(HDR-S) was done from

minimum of 0 to maximum 4 as mentioned in DSM-V depending upon the severity of the particular symptom.

Before starting of treatment, the total score of HAR-S was 23 and after completion of

treatment, it got 02. Likewise, in case of HDR-S, grading comes from 38(before treatment started) to 11(after completion of treatment).

Table 1: showing changes of signs and symptoms:

Signs & Symptoms	BT	F1	F2	F3	AT
Craving	4	3	2	1	0
Irritability	4	3	3	2	1
Pimples	0	0	0	0	0
Headache	0	0	0	0	0
Anger	4	4	3	1	1
Anxiety	4	3	3	2	1
Difficulty in concentration	4	3	3	1	1
Mouth sore	0	0	0	0	0
Constipation	3	2	1	0	0
Restlessness/Impatience	4	3	2	1	1
Increase appetite	0	0	0	0	0
Depression/ Sadness	4	4	3	2	2
Tension	4	3	3	2	1
Dreams	4	4	3	2	1
Frustration	4	3	2	2	0
Psychological need	4	2	2	0	0

Table 2: Result on subjective parameters

PARAMETER	BT	F1	F2	F3	AT
Fagerstrom test for Nicotine Dependence	10	8	7	5	1
Hamilton Anxiety Rating Scale	23	12	10	6	02
Hamilton Depression Rating Scale	38	22	14	11	11

*BT= Before Treatment, F1, F2, F3= Follow up 1, 2 & 3 respectively, AT= After treatment.

DISCUSSION:

Probably the drug conveyed through nose is absorbed rapidly due to the high density of the blood supply in the area that is Kiesselbach's area or plexus (is an anastomosis of five blood vessels in the anterior inferior quadrant of the nasal septum over the septal cartilage). The avoidance of first pass metabolism and due to large surface area the drug absorbed through porous endothelium membrane (due to its lipophilic nature), it probably passes through the olfactory transfer or along the perineural space surrounding the olfactory nerve cells into the Cerebrospinal Fluid surrounding the olfactory bulbs of the brain crossing the Blood Brain Barrier and finally reaches its destination. *Teekshna* (Sharp) properties of Vacha and Kushtha (drugs used in Brahmi Ghrita) may give a synergistic action helping to correct the mental and intellectual functions. Hence, *Nasya Karma* (Errhine therapy) with *Brahmi Ghrita* has been selected in this study to pacify the *Avarana* of *Rajas* and *Tamas* (Enclosure of *Rajas* and *Tamas*) by virtue of their *Teekshna Guna*. Also, *Ghrita* having *Vata-Pitta hara* properties serves the function of *Vata-pitta Shamana* thereby nourishes the brain by *Brimhana* (Nourishing) effect. So, *Nasya* with *Brahmi Ghrita* produces significant change in mental state. The various *Manasa Bhavas* (Psychological factors) like *Krodha*, *Bhaya*, (Anger, Fear). also comes under control through the *Nasya* therapy. Also, the drugs used in the self- made powder formulation also possess nootropic properties which further aids in bringing normal mental state.

Various Pharmacological properties of constituents of Brahmi Ghrita:

Brahmi (Bacopa Monneri): *Brahmi Ghrita* is a potent CNS (Central Nervous System) activity enhancer [8]. Also, researches shows the anti-depressant and anxiolytic effect of

Brahmi Ghrita. *Brahmi* shows better acquisition, improved retention and delayed extinction, improved performance in various learning situations. [9] *Brahmi* is a potent antioxidant.[10] The results confirm that the facilitating effect of bacosides is due to their ability to consolidate the retention at the earliest form, i.e., Short term memory (STM). In nutshell, *Brahmi* shows Tranquilizing, Smooth muscle relaxant, Nootropic, Nerve tonic, Adoptogenic, Anti stress, Anxiolytic, Anti-depressant, Memory booster, learning facilitator effect.

Vacha (Acorus calamus): Alcoholic extract of plant causes sedative and analgesic effects, moderate depression in blood pressure and respiration. Other pharmacological activities are hypothermic, hypotensive, spasmolytic, and CNS (Central Nervous System) depressant, anti convulsant, carcinogenic, antimicrobial, anthelmintic, insecticidal, antibacterial, sedative and tranquilizing [11]. Doshi T, *et. al.* found that *Vacha* powder has shown marked improvement in depression in clinical trials, while experimental study revealed that *Vacha* decoction possess mild sedative activity. It produced non-significant CNS (Central Nervous System) depression [12].

Kushtha (Sauserra lappa): Anti-cytotoxic, diuretic, antibacterial, hypolipidemic, antiseptic, hypotensive, spasmolytic, bronchodilator, anti-inflammatory, immunostimulant. An Ayurvedic formulation comprising *Kushtha* was found almost equal to chlorpromazine in reducing various mental symptoms in Schizophrenic patients [13].

Shankhpushpi (Convolvulus pluricaulis): Spasmolytic, hypotensive, sedative, anti-inflammatory, anti-stress, CNS (Central Nervous System) depressant, hypoglycemic, hypolipidemic, anti-anxiety. Various clinical trials have shown beneficial effect in

patients with anxiety-neurosis. It produces a feeling of well-being, good sleep, and relief in anxiety, nervousness, palpitation, and found useful in mental fatigue [14].

Cow's Ghee: Ghee contains 8% lower saturated fatty acids which makes it easily digestible. Its digestibility coefficient or rate of absorption is 96% which is highest of all oils & fats¹⁵. Ghee is lipophilic and this action of ghee facilitates transportation of ingredients of formulation to a target organ and final delivery, inside the cell, up to the mitochondria, microsomal and nuclear membrane, because cell membrane also contains lipid¹⁵. Vitamin A and E are antioxidants that help in preventing oxidative injury to the body. Due to the Palatability of *Ghee* even at higher dose, relative to oil it is most acceptable to the internal environment of the body [15].

Mode of action of *Nasya*:

Nasa is the portal (gateway) of *Shirah*. The drug administered through nose as *Nasya* reaches to the brain and eliminates only the morbid *Doshas* responsible for producing the disease [16].

In *Ashtanga samgraha*, it is explained that *Nasa* being the door way to *Shirah* (head), the drug administered through nostrils, reaches *Shringataka* (a *Sira Marma*) by *Nasa Srota* and spreads in the *Murdha* (brain) taking route of *Netra* (eye), *Shrota* (ear), *Kantha* (throat), *Siramukhas* (opening of the vessels) etc. and scratches the morbid *Doshas* in supra clavicular region and extracts them from the *Uttamanga* [17].

Pharmacodynamics of *Nasya*:

There is no such direct pharmacodynamics consideration between nose and cranial organs. Moreover, blood brain barrier is a strict security system of human brain. The nose is used as route of drug administration for inhalation of anesthetic materials and certain decongestants for paranasal

sinusitis. Anterior pituitary hormone, nasal sprays are in practice with modern medical system. Nasal administrations of luteinizing hormone and calcitonin are found to be equally effective as intravenous infusions in maintaining blood concentrations¹⁸. Michael Russel has observed that perspired scent that has been painted on the upper lips has caused the synchronization of the menstrual cycle in female volunteers by contact smelling¹⁸. A LRH (leptotropin releasing hormone) agonist nasal administration for 3-6 months was observed effective in inhibiting ovulation as a contraceptive measure. The drugs are mostly believed in these cases to be absorbed through nasal and pharyngeal mucosa. Anand has also attempted a Comparative Study on method of contraception as Nasal route and opined that the route is beneficial than systemic administration. It was claimed that the concentration of drug in C.S.F. (Cerebrospinal Fluid) was found to be very high to that when administered intravenously [18].

An experimental study on the inhibiting effect of Jasmine flowers on lactation was also carried out by fragrance inhalation method proving beneficial on rats. Reduction in gland activity and reduction in serum prolactin was also noted. Hypoglycemic effects of insulin and hyperglycemic effects of glucagon hormone are confirmed by intranasal administration in normal and in diabetic patients. Intranasal Gonadotropin releasing hormone has been therapeutically recommended in stimulating luteinizing hormone secretion in crypt orchid boys i.e. having undescended testis. Scientist of the institute of medical sciences Delhi have proved after experiments that the drug administered through nose shows effective action on the brain, so it can be said that there is very close relation between *Shirah* and *Nasa* (nose) [18].

Personified Ayurvedic Powder:***Brahmi (Bacopa monniera):***

Pharmacological studies showed that *Bacopa monniera* possessed many pharmacological effects included central nervous effects (memory enhancement, antidepressant, anxiolytic, anticonvulsant and antiparkinsonian), antioxidant, gastrointestinal, endocrine, antimicrobial, anti-inflammatory, analgesic, cardiovascular and smooth muscle relaxant effects [19].

Shankhpushpi (Convolvulus pluricaulis):

is an important drug of indigenous system of medicine. According to Ayurveda, *Shankhpushpi* is bitter, pungent, alexiteric, alternative, tonic, anti-helminthic, brightens intellect, useful in bronchitis, biliousness, epilepsy, leucoderma and teething troubles of infants etc. It contributes considerably to the improvement of the memory power and intellect. The whole plant is used as medicinal formulations [20].

Ashwagandha (Withania somnifera):

is very revered herb of the Indian Ayurvedic system of medicine as a Rasayana (tonic). It is used for various kinds of disease processes and specially as a nervine tonic. Considering these facts many scientific studies were carried out and its adaptogenic / anti-stress activities were studied in detail. In experimental models it increases the stamina of rats during swimming endurance test and prevented adrenal gland changes of ascorbic acid and cortisol content produce by swimming stress. Pretreatment with *Withania somnifera* (WS) showed significance protection against stress induced gastric ulcers [21].

Jatamansi (Nardostachys jatamansi):

bears many therapeutic activities like antifungal, antimicrobial, antioxidant, hepatoprotective and cardio protective properties. It is used in the treatment of insomnia and CNS disorders. The

vasodilator, bronchodilator, spasmolytic and platelet aggregation inhibition activities of the plant have also been reported. *Jatamansone*, *nardostachone* and *actinidine* are the major secondary metabolites present in the plant. [22]

Sarpagandha (Rauwolfia serpentina):

has been used since pre-vedic period for the treatment of snake bite (*Sarpadansh*), insect stings, hypertension (*Raktachaap Vriddhi*), insomnia (*Anidra*), psychological disorders (*Manovikar*), gastrointestinal disorders (*Amashayagata roga*), epilepsy (*Apasmara*), wounds (*Vrana*), fever (*Jwara*), and schizophrenia (*Unmada*). It is a large glabrous herb or shrub, belonging to family Apocynaceae. It is a source of many phyto-constituents including alkaloids, carbohydrates, flavonoids, glycosides, phlobatannins, phenols, resins, saponins sterols, tannins, and terpenes. The main alkaloid of *R. serpentina* is reserpine. It exerts antihypertensive property by depleting the catecholamine which is the main action of the plant. Besides, many studies have been describing multidimensional pharmacological activities of the *R. serpentina* [23].

Guduchi (Tinospora cardifolia):

commonly known, as "*Amrita*" or "*Guduchi*" is an important drug of Indian Systems of Medicine (ISM) and used in medicines since times immemorial. The drug is well known Indian bitter and prescribed in fevers, diabetes, dyspepsia, jaundice, urinary problems, skin diseases and chronic diarrhoea and dysentery [24]. It has been also indicated useful in the treatment of heart diseases, leprosy, helmenthiasis and rheumatoid arthritis [24-27]. The starch obtained from the stem known as "*Guduchi-satva*" is highly nutritive and digestive and used in many diseases.

CONCLUSION:

From the above results, it can be concluded that *Nasya Karma* using *Brahmi Ghrita* and Personified Ayurvedic Powder (self-made formulation) can provide significant relief in patients overcoming symptoms of Substance Use Disorder.

LIMITATION OF STUDY:

This is a single study and further study on same protocol is needed for its validation in more numbers of cases

CONSENT OF PATIENT:

Informed written consent has been taken from the patient for procedure.

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CONFLICT OF INTEREST: Author declares that there is no conflict of interest.

GUARANTOR: Corresponding author is guarantor of this article and its contents.

SOURCE OF SUPPORT: None

HOW TO CITE THIS ARTICLE:

Sharma R, Shukla GD. Managing Symptoms of Substance Use Disorder with Nasya and Ayurvedic Medicines: A Case Study. Int. J. AYUSH CaRe. 2022; 6(3):325-333.