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RESEARCH ARTICLE

ADD ON EFFECT OF *DHŪPANA* WITH *JAṬĀDI VARTI* IN POSITIVE SYMPTOMS OF SCHIZOPHRENIA - A SINGLE GROUP CLINICAL TRIAL (AB DESIGN)

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ABSTRACT

Introduction: Schizophrenia is one of the most debilitating, complex and chronic psychiatric disorders which disrupt a person's ability to think, feel and act. It is characterized by delusions, hallucinations, disorganized behaviour, grossly disorganized or catatonic behaviour and negative symptoms. Among this delusions, hallucinations, disorganized behaviour and grossly disorganized or catatonic behaviour can be called as positive symptoms of schizophrenia. Most of the symptoms of schizophrenia found similar to the symptoms of *unmāda*-a disease explained in Ayurveda classics. So schizophrenia can be correlated with *unmāda* and its management is being used with efficacy in such cases. A management protocol with *sodhana* (elimination therapy), *samana* (palliative therapy) followed by *rasāyana* (rejuvenation therapy) and *satvāvajaya*, distinct psycho educative approach is being in use for schizophrenia. *Dhūpana* (fumigation therapy) is one of the techniques mainly used in the management of psychotic conditions along with *sodhana* and *samana*. *Jaṭādi varti dhūpana* which is being practicing for the last 10 years has taken as trial drug for its efficacy in the positive symptoms of schizophrenia. **Methodology:** 28 subjects satisfying the inclusion criteria were selected from OPD of Vaidyaratnam PS Varier Ayurveda College and Government Ayurveda Research Institute for Mental diseases (GARIM), Kottakkal and those who were taking antipsychotics and had no improvements were considered as phase A and observed for 2 weeks and then they were administered *jaṭādi varti dhūpana* as phase B for 15 minutes twice daily for a period of 7 days. Assessments were done using Scale for Assessment for Positive Symptoms of Schizophrenia (SAPS) and WHO Quality Of Life BREF questionnaire on 0th, 14th, 18th, 21st and 28th day. **Results:** On assessment, most of the domains were statistically significant at the level of $p < .05$. The study concluded that administration of *jaṭādi varti dhūpana* has got significant effect in reducing the positive symptoms of schizophrenia and also in the quality of life.

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INTRODUCTION

Schizophrenia is one of most distressing psychiatric illness which affects a person's capacity to distinguish the world around them. It is characterized by fundamental and characteristic distortions of thinking, perception, and by inappropriate or blunted affect (World Health Organization, 2007). Hallucinations, delusions, bizarre behavior and positive formal thought disorders are the positive symptoms of schizophrenia. According to DSM V (Diagnostic and

Statistical Manual of Mental Disorders) the lifetime prevalence of schizophrenia appears to be approximately 0.3% - 0.7% (American Psychiatric Association, 2013) where antipsychotic medications (APs) are the stronghold of the treatment (Troy, 1998). Other psychosocial therapies such as social skill training, cognitive behavior therapy, individual therapy etc. are also incorporated so as to enhance the social abilities, self-sufficiency, practical skills and interpersonal communication in those with schizophrenia (Abdul Kadir Abu Bakar, 2011). *Unmāda* is a representative of *mānasikaroga* (psychiatric disease) explained in the Ayurveda texts resulting in the *vibhrama* or alteration of eight factors of mental functions such as *manas* (mind), *buddhi* (Intellect), *saṁjñā jñāna* (Orientation), *smṛti* (Memory), *bhakti* (desires), *śīla* (daily routines), *ceṣṭa* (body movements) and *ācāra* (rituals).

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Along with this the equilibrium of fundamental bodily bio-elements such as vāta, pitta and kapha also gets hampered. These are the basic pathogenesis characteristics of any *manasikaroga* (Jādavaji Trikamji Āchārya, 2015) available in the clinical scenario and can be found in schizophrenia too. Most of the symptoms of schizophrenia such as hallucination, delusion, disorganized behaviour and disorganized speech can be correlated with features of *unmāda* such as inappropriate weeping, angry, laughing, smiling, dancing, singing, playing of musical instruments; inappropriate body movements, making loud noises, roaming around constantly and decorating himself with non-decorating materials, imitating sounds of musical instruments, irrelevant talk, violent nature, attacking others, nudity, terrifying activities, hatredness to cleanliness, inappropriate thought and the lack of power to discriminate what is right and wrong and what is good and bad etc. An extensive *cikitsa* has explained for *unmāda* such as *śodhana*, *śamana*, *rasāyana* and *satvāvajaya*. Here *śodhanakarmās* includes *snehapāna* (intake of ghee alone), *vamana* (therapeutic vomiting), *virecana* (purgation therapy), *vasti* (enema), *naśya* (nasal therapy- instillation of medicine via nose). *Śamana* includes *dhāra* (an oil dripping therapy), *talapotichil* (anointment to head/ head pack), *talam* (retention of medicine at center of head) *añjanam* (collyrium), *dhūpana* and intake of internal medications. In *unmāda*, techniques such as *dhūpana* is indicated even if the disease persists after *śodhana karmās*. It is especially indicated to alleviate *vāta-kapha doṣās* and to bring harmony of mind. *Dhūpana* is also capable to enlighten *mana*, *buddhi*, *smṛti* and *saṃjñā jnāna* (Jādavaji Trikamji Āchārya, 2015).

Need and significance: Modern management of schizophrenia has several limitations even if there are several available pharmacological medications. Antipsychotics are the mainstay for the management of the schizophrenia but it has got numerous adverse effects from relatively minor tolerability issues to very unpleasant, painful, disfiguring and life threatening issues (Scott Stroup, 2018). Hence further innovations are the need of the hour. Few Ayurveda studies has been conducted on the role of various Ayurveda treatments in the management of schizophrenia. The treatments included were *snehapāna*, *virecana*, *vasti* (Aswani, 2019), *śirodhāra*, *medhyarasaśāyana* (drugs enhancing the cognitive functions) and *satvāvajaya* (Sanjeev Rastogi, 2018). Even though these treatments were effective, it required long duration, more expense and difficulty in administering in case of non-cooperative patients. As it is a social issue, curing the disease is equally important as improving the quality of life of the affected. So, more research works have to be conducted for exploring feasible techniques. Here *dhūpana* is very easy to administer in non-cooperative patients, only consumes minimum time and cost effective too, so it is more feasible to administer.

METHODOLOGY

Aim

- To explore the role of *dhūpana* in schizophrenia

Objectives

Primary objectives

- To study the efficacy of *jaṭādi varti dhūpana* in positive symptoms of schizophrenia.

Secondary objective

- To assess the quality of life of those affected with schizophrenia

MATERIALS AND METHODS

Materials

- *Jaṭādi varti* was purchased from Arya Vaidya Sala Kottakkal Batch no: SP00116 and Production no: 0020617
- SAPS (Scale for Assessment of Positive symptoms of Schizophrenia)
- WHO QOL BREF questionnaire (Schizophrenia is a severe, disabling and lifelong disorder associated with severe social and occupational dysfunction. For the last two decades the concept of outcome in psychiatry has been widened beyond symptom improvement to improvement of quality of life. So, it is essential to assess the quality of life of schizophrenia patients. So included as secondary objective)

Methods

Study design: Single group clinical trial (AB design).

Settings: OPD and IPD of VPSV Ayurveda College & GARIM Kottakkal.

Study period: 18 months.

Sample size: 28 (Purposive sampling).

Study design: Single group clinical trial (AB Design).

Duration: 18 months.

Study period: 2016-2018

Intervention

- Those who were on antipsychotics and had no improvements were considered as phase A and observed for 2 weeks and then they were administered *jaṭādi varti dhūpana* as phase B.
- Inhalation of the fumes of *jaṭādi varti* (*jaṭāmānsi*, *haridra*, *dāruharidra*, *hiṅgu* and *vaca*) with ghee 2 g in the form of *varti* for 15 minutes during morning (7 am – 8 am) and evening (5 pm – 6 pm)
- Duration: 1 week
- Follow up: 1 week

Dhūpana procedure

Participants were advised to sit comfortably in a non-ventilated room in their place of residence and instructed the following.

- To ignite the prepared *jaṭādi dhūpana varti*

- Keep it in a container and place it over the centre of the room
- Remain in the same position comfortably for 15 minutes
- In case of feeling any discomfort during the procedure the participants were advised to leave the room.

One of the participant reported discomfort such as breathing difficulty, suffocation and fatigue on exposure to *dhūpana* for 10mts so as per the instruction he immediately left the room and felt relaxed and became dropout of the study. Further he was treated with classical schizophrenia protocol from GARIM Kottakkal. The protocol was approved by the Research committee and Institutional ethics committee. The IEC No: IEC/ C1/09/19, dated 28/05/2019. Diagnostic criteria: based on Diagnostic and Statistical Manual of Mental disorders- (DSM-5) (American Psychiatric Association, 2013).

Inclusion criteria: Those subjects between 18 to 60 years with no discrimination of gender, caste, religion and economic status satisfying DSM-5 criteria and who were under antipsychotic medication for 6 weeks and above with a given informed consent from the patient or legal guardian were included. The upper limit of age was fixed as 60 so as to include patients with late onset schizophrenia too.

Exclusion criteria: Schizophrenia with negative symptoms only, organic mental diseases, major systemic disorders, psychoactive substance abuse, pregnant and lactating women and those with respiratory allergy were excluded.

Assessment criteria: Assessments were done on 0th day (first day of visit) and 14th day (after phase A to ensure antipsychotics doesn't interfere with the status of symptoms), 18th day (three days after starting therapy to know the immediate effects of *dhūpana*) and 21st day (after completing therapy) and 28th day (after follow up period) by using SAPS Scale and before and after *dhūpana* therapy by WHO QOL BREF questionnaire.

Drug review: *Jaṭādi dhūpana varti* is a medicine comprises of the five drugs such as *jaṭāmānsi* (*Nardostachys jatamansi*), *vaca* (*Acorus calamus*), *haridra* (*Curcuma longa*), *dāruharidra* (*Coscinium fenestratum*), and *hiṅgu* (*Ferula assafoetida*) with ghee. Direct reference of this combination of drugs is not available in any of the classical text books. But all these drugs are indicated for *dhūpana* in one or another context of *unmāda*. Based on conventional practice and its efficacy in the management of *unmāda*, it has been selected as the trial drug. Most of the drugs are *vātakaphahara*, two of the drugs have got *pittaharatva* too. Apart from this two of the drugs have got *medhya* (Intellect/cognition boosting property) as *prabhāva* (specific action).

Observations and analysis: The effect of therapy with in groups was tested with Friedman Test, followed by Wilcoxon Signed Ranks Test for pairwise comparisons. Derailment, tangentially and pressure of speech were not found in any of the participant in the study so it has been excluded from the analysis. Majority of the domains showed significant changes by the procedure in all the assessments. The quality of life of schizophrenia patients were assessed using Quality of life BREF Questionnaire before and after the treatments. After the analysis, in many of the symptoms statistically significant changes were found.

Table no.1. Friedman Test- effect of procedure in Hallucinations

SL No.	Hallucinations	Chi-square	p- value
1.	Auditory hallucination	24.26	p<.001
2.	Voices commending	12.15	p<.05
3.	Voices conversing	15.82	p<.01
4.	Tactile hallucinations	16.10	p<.01
5.	Olfactory hallucinations	12.00	p<.05
6.	Visual hallucinations	15.42	p<.01
7.	Global rating of hallucinations	33.28	p<.001

Table no.2: Friedman Test- effect of therapy in Delusions

SL No.	Delusions	Chi-square value	p- value
1.	Persecutory delusions	37.86	p<.001
2.	Delusions of jealousy	1.33	p>.05
3.	Grandiose delusions	4.00	p>.05
4.	Religious delusions	No effect for therapy	
5.	Somatic delusions	9.02	p>.05
6.	Delusions of reference	51.87	p<.001
7.	Delusions of being controlled	4.71	p>.05
8.	Delusions of mind reading	11.02	p<.05
9.	Thought broadcasting	4.00	p>.05
10.	Thought insertion	2.40	p>.05
11.	Thought withdrawal	No effect for the therapy	
12.	Global rating of delusions	53.50	p<.001

Table no.3: Friedman Test- effect of procedure in bizarre behaviour

SL No.	Bizarre behaviour	Chi- square	p- value
•	Clothing and appearance	4.00	p>.05
•	Social and sexual behaviour	31.26	p<.001
•	Aggressive and agitated behaviour	46.43	p<.001
•	Repetitive or stereotypic behaviour	12.00	p<.05
•	Global rating of bizarre behaviour	34.61	p<.001

Table no.4: Friedman Test- effect of procedure in bizarre speech/ positive formal thought disorder

SL No.	Positive formal thought disorder	Chi- square	p- value
1.	Incoherence	4.00	p>.05
2.	Illogicality	4.00	p>.05
3.	Circumstantiality	No effect for the therapy	
4.	Distractibility	10.22	p<.05
5.	Clanging	No effect for the therapy	
6.	Global rating of positive formal thought disorder	6.66	p>.05

Table No. 5: Effect of procedure on domain 1- Physical health - Friedman Test

Assessment	Ranks	Mean Rank	Sum of Ranks	p- value	% relief
Dom 1-BT- Dom 1-AT	Negative Ranks	5	5	p<.001	21.12%
	Positive Ranks	10.79	205		

Table No. 6: Effect of procedure on domain 2- Psychological health - Friedman Test

Assessment	Ranks	Mean Rank	Sum of Ranks	p- value	% relief
Dom 2 - AT- Dom 2 - BT	Negative Ranks	2	2	p<.01	8.41%
	Positive Ranks	7.42	89		

Table No.7. Effect of procedure on domain 3- Social relationships - Friedman Test

Assessment	Ranks	Mean Rank	Sum of Ranks	p-value	% relief
Dom 3- AT- Dom 3- BT	Negative Ranks	0	0	p<.05.	7.86
	Positive Ranks	3.5	21		

Table No. 8. Effect of procedure on domain 4- Environment - Friedman Test

Assessment	Ranks	Mean Rank	Sum of Ranks	p- value	% relief
Dom4- AT –	Negative Ranks	0	0	p>.05.	1.51%
Dom4- BT	Positive Ranks	2	6		

Three of the domains showed significant changes at $p < .05$.

Table No.9. Percentage of relief on SAPS scale

DOMAIN	0-14	0-18	0-21	0-28
Hallucinations				
Auditory Hallucinations	0	12.27	23.65	14.97
Voices Commending	0	08.72	16.51	07.78
Voices Conversing	0	12.14	18.38	02.80
Tactile Hallucinations	-2.18	08.43	13.43	11.25
Olfactory Hallucinations	0	08.54	08.54	08.54
Visual Hallucinations	0	11.52	11.52	09.96
Global Rating of Hallucination	0	25.00	29.31	14.94
Delusions				
Persecutory Delusions	0	25.76	33.24	25.20
Delusions of Jealousy	0	02.95	02.95	02.95
Delusions of Guilt or Sin	0	00.00	00.00	00.00
Grandiose Delusions	0	02.95	02.95	02.95
Religious Delusions	0	00.00	00.00	00.00
Somatic Delusions	0	02.56	08.33	08.33
Delusions of Reference	0	27.58	39.25	35.01
Delusions of Being Controlled	0	05.21	03.90	02.28
Delusions of Mind Reading	0	10.00	11.25	09.68
Thought Broadcasting	0	02.29	03.93	02.29
Thought Insertion	0	02.95	02.95	02.95
Thought Withdrawal	0	00.00	00.00	00.00
Global Rating of Delusions	0	29.05	40.05	38.21
Bizarre behaviour				
Clothing and Appearance	0	02.96	02.96	00.00
Social and Sexual behaviour	0	29.64	39.35	26.95
Aggressive and agitated behaviour	0	31.29	44.03	26.52
Repetitive and stereotypic	0	11.14	08.28	02.86
Global rating of Bizarre behaviour	0	13.40	20.61	15.46
Positive formal thought disorder				
Circumstantiality	0	00.00	00.00	00.00
Incoherence	0	00.00	02.96	02.96
Illogicality	0	02.95	03.93	01.63
Distasteful speech	0	05.73	8.28	08.28
Clanging	0	00.00	00.00	00.00
Global rating of positive formal of thought	0	5.82	5.82	02.91

DISCUSSION

Discussion on dhūpana: Dhūpana is one of the treatment procedures that explained in the classics for purifying the external as well as internal environment (Kanipayyur Sankaran Nambhoorthi, 2006). A study conducted by Sahara shrestha et al. in 2017 stated that there are total of 94 dhūpana formulations in the *brihatrayi* (three major texts of Ayurveda) (Sahara shrestha, 2017) among which many are explained in the context of *mānasika rogās* such as *unmāda*, *graha* (demonology), and *apasmāra* (epilepsy). In *unmāda*, dhūpana is indicated if the disease persists even after doing *śodhana* procedures mainly for the conditions due to *vātakapha doṣa* (Jādavaji Trikamji Āchārya, 2015) Suśruta Saṁhita explained it among the *sāmānya cikitsa* (general treatment) itself (Jādavaji Trikamji Āchārya, 2014). The effect of dhūpana is clarifying *manas*, *buddhi* and *saṁjñā jnāna* (Jādavaji Trikamji Āchārya, 2015). Dalhana comments that dhūpana is bringing harmony of the mind by its *prabhāva* (Jādavaji Trikamji Āchārya, 2014). In *apasmāra* it is explained that *dhūpanādi karma* purifies *manovahasrotas* (channel of mind) (Narayanan, 2004) and results in regaining *saṁjñā* (Jādavaji Trikamji

Āchārya, 2015). Kāsyapa Saṁhita explained *dhūpana* so as to protect the children from possible infections (Tiwari, 2002). From all these references it is clear that *dhūpana* has got important role in the management of *mānasika rogās*.

Discussion on effect of procedure on SAPS Scale and WHO QOL Questionnaire: Impairment of *manodoṣa* (*rajas* and *tamas*) leads to *āvarana* (obstruction/resistance) of *hrdaya* (seat of *buddhi*) and *manovaha srotas* by *tamas* and *kapha* which leads to *buddhi vibhrama* where an individual perceives *nitya* (eternal) as *anitya* (non-eternal) and *hita* (conductive) as *ahita* (non-conductive) and vice versa, leading to hallucination. Due to *mano vibhrama*, one thinks things as weird or not thinks about the matters to be thought of, causing delusions. Bizarre behavior is due to *vibhramās* of the other factors of mind such as *buddhi*, *saṁjñājnāna*, *smṛti*, *bhakti*, *śīla*, *ceṣṭa* and *ācara*. The *arthās* (objects) of *mana* namely *cintya* (thought), *vicārya* (critical analysis), *oohya* (hypothesis), *dhyeya* (knowledge of contemplation) and *sankalpa* (knowledge that determines merits or demerits) and *karma* (action) of *mana* like *oohya*, *vicārya*, *indriyābhigraha* (to indulge the sense organs in their respective objects) and *svasyanigraha* (to control self and keep detached from undesired subjects) (Jādavaji Trikamji Āchārya, 2015) gets hampered by vitiation of *mano* and *śarīra doṣa* leading to positive formal thought disorder.

At the end of treatment significant changes were attained and the %relief of delusions, hallucinations, disorganized behaviour and disorganized speech was 14.94%, 38.21%, 15.46%, and 1.63% respectively. In the study conducted by Nasheeda et al. it was 52%, 43%, 59% and 59% respectively. This change in % of relief with the present study is may be due to the increased effect of selected Ayurveda treatment protocol than a single procedure (Nasheeda karuvattil, 2015). Activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility pain and discomfort, sleep and rest and work capacity are the dominions of the domain physical health. Participants of the study had increased energy, improvement in sleep, fatigue, work capacity and activities of daily living. Even the patients with less significant changes were opined a total well-being after the *dhūpana*. Bodily image and appearance, negative feelings, positive feelings, self-esteem, spirituality / religion / personal beliefs and thinking, learning, memory and concentration are the dominions of the psychological domain. Many of the participants opined reduced negative feelings, increased concentration, self-esteem and positive feelings after the *dhūpana*. Personal relationships, social support and sexual activity are the dominions of social relationships and *dhūpana* had helped in removing the hindrance to the interactions. There were no significant changes in the environment domain by the procedure.

Discussion on dhūpana and mode of action

Jaṭādi varti is composed of *jaṭāmañci*, *vaca*, *haridra*, *dāruharidra* and *hiṅgu* along with ghee. *Vaca*²² and *hiṅgu*²³ possess *tikṣṇa* (penetrating), *uṣṇa* (hot) *guṇa* (quality) and *kaṭu* (pungent) *vipāka* (final outcome of biotransformation of taste or *rasa*). *Haridra*²⁴ possess *rukṣa* (dryness), *uṣṇa guṇa* and *katu vipāka* and are predominantly *vāta-kaphahara*. *Dāruharidra* (Sastry, 2010) possess *rukṣa*, *uṣṇa guṇa*, *katuvipāka* and *kasāya* (astringent) *tikta* (bitter) *rasa* (taste) and it is *kapha-pittahara*. *Jaṭāmañci* (Sastry, 2010) possess *kaṣāya tikta*, *madhura* (sweet) *rasa*, *snigdha* and *sita guṇa* and

katu vipāka and it is *pitta pradhāna tridosahara*. *Jatāmañci* and *vaca* have *medhya prbhava*. The drug is capable of removing the *āvarana* of *hrdaya*, *indriyās* and *manovahasrotas* by *kapha* and *tamas* and normalizing the equilibrium of *rajas*, *tamas* and *tridoṣa*. For the manifestation of positive symptoms *vāta*, *pitta* and *kapha doṣās* are also involved. Here *Jatādi varti dhūpana* removes the *āvarana* of *kapha* and *tamas* and also brings on *vāta anulomana* (proper movement) which normalizes the *doṣās* and brings stability of *mana*. Thus it may help in proper functioning of *indriyās* and thereby proper process of cognition. Also the procedure enlightens *mana*, *buddhi*, *smṛti* and *sañjñā* (Jādavaji Trikamji Āchārya, 2015) which explain the mode of action. Adding ghee help in reducing the *tikṣṇatva* of the *dhūpana* drugs and also helps in rapid combustion of cellulose of herbs and keeps the fire alight. The mode of action of inhalation is explained in a study conducted by Dalinda Isabel et al. as the essential oils coming out of the drugs during inhalation can stimulate the olfactory receptors in the nasal epithelium connected to the olfactory bulb. Then it arouses limbic system and hypothalamus in the brain leads to stimulation of hypothalamic pituitary axis and in the olfactory cortex it regulates the release of neurotransmitters for example serotonin, dopamine and helps in controlling the symptoms (Dalinda Isabel, 2017).

Conclusion

The study concluded that there is role for *dhūpana* in *mānasika roga* and the *dhūpana* of *jaṭādivarti* for 15 minutes twice daily for a period of 7 days has got significant efficacy in positive symptoms of schizophrenia. Further studies are the need of the hour so as to enhance the efficacy of the Ayurveda treatment modalities in managing conditions such as Schizophrenia.

Limitations of the Study

- The absence of a control group is one of the limitation of this study so AB design is selected to minimize this issue.
- The duration of prior antipsychotic therapy as 6 weeks is a limitation as some patients take 8-12 weeks to respond fully to antipsychotic therapy. But in this study all the participants were under antipsychotic therapy for more than 12 weeks.

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