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EFFECT OF MUSALI CHURNA (CURCULIGO ORCHIODES) IN BADHIRYA W.S.R TO SENSORY NEURAL HEARING LOSS

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ABSTRACT

Background-There are so many Socio-medical problems like hearing loss, and we can consider this as a hidden disability. *Krishna Musali (Curculigo orchiodes*), *Ayurvedic* medicine is explored for its effect in the management of *Badhirya* with special reference to Sensory Neural Hearing Loss. **Aim and Objective-** To evaluate the effect of *Musali Churna (Curculigo Orchiodes)* in *Badhirya* with special reference to Sensory Neural Hearing Loss. **Methods-** 41 patients were screened from OPD in an academic hospital. Among them, 30 patients fulfilling diagnostic and inclusion criteria were enrolled and randomized. Data were analyzed and informed written consent was received from patients. In Group A (n = 15) received *Musali churna* 3gm BD while Group B (n = 15) received *Sarivadi Vati* 1 tablet (750mg) TID respectively for 30 days. The assessment was done based on improvement in Pure tone Audiometry findings. Follow up visit was on every 15th day. (Total 3 follow ups in periods of 45 days). **Results-** Results were assessed using the "Independent t-test" and paired t-test. **Conclusion-** *Musali Churna* produced significant improvement in audiometry reading and was also effective in *badhirya* and both groups were comparable

Keywords: *Badhirya, Musali Churna,* Pure tone audiometry, *Sarivadi Vati,* Sensory Neural Hearing Loss

INTRODUCTION

Ayurveda is an ancient science that was composed by Brahma and considered as the branch of *Atharvaveda*. It advises the inimitable principles of *Tridosha*, *Dhatu* and *Mala* for good health. *Ayurveda* has presented itself as a solution through its eight branches *Kaya, Bala, Graha, Urdhwanga, Shalya, Damstra, Jara* and *Vrisha.*[1] *Shalakya tantra* is one of the divisions of *Ayurveda* which deals with diseases mainly of Ear, Nose, Throat, Oral cavity, Eye, Head & Neck and all the diseases above the Clavicle [2]

Hearing loss is one among the many Socio-medical problems, which is considered as a hidden disability. Global burden of this disease, which incorporated estimated that the population with hearing loss rose from 1.2 billion (17.2%) in 2008 to 1.4 billion (18.7%) in 2017[3]. Hearing Loss is impaired hearing & is a great handicapped position. One can easily understand the evil state of a Lame or a blind person because all such conditions can easily be made out. Whereas the handicapped position of the deaf cannot be easily noticed, hence deaf always lacks the sympathy of others. Based on clinical features and pathogenesis, hearing loss can be correlated with the disease *Badhirya* mentioned in ancient texts, though there is no specific description of the disease. *Acharya Sushruta* has mentioned it as a disease entity under 28 *Karna rogas*, *Acharya Charaka* included it under the 80 *Nanatmaja Vata Vikara*, *Acharya Vagbhata* has described *Badhirya* under 25 *Karna rogas* [4]. Hearing loss according to modern science denotes loss of auditory function & has gone into the details of its classification, such as conductive deafness, sensorineural deafness & mixed deafness [5]. In Ayurveda two type of *Badhirya* has been mentioned i.e., *Vataja* &*Vatakaphaja* which are in parlance with modern classifications. Similarly, the causes may either be Congenital, Acquired or Hereditary.

Treatment includes medicinal, surgical & hearing aids. Though all these give good results provided a correct diagnosis is made & the respective treatment employed. Unfortunately, this is not so & to add to the problem, administration of nasal decongestants & antibiotics for a longer duration can lead to altered manifestations instead of curing the causes. The microsurgical procedures too are not without complications. So, all these above facts leave a scope to find out a better solution for the disease *Badhirya* from amongst the medical heritage of traditional Indian Systems of medicine has a better answer to the problem. At many centres in the country, useful work is done on other diseases, but very little work has been carried out on *Badhirya*. *Musali churna is rasayana* explained for *Karna Badhirya* [6]. The primary aim is to evaluate the efficacy of *Musali Churna* (Curculigo orchiodes) in *Badhirya* w.s.r to Sensory Neural Hearing Loss and the secondary aim is to compare the effect of *Musali Churna* (Curculigo orchiodes) over *Sarivadi vati* in Management of *Badhirya*.

Subjects and Methods:

The patients attending the outpatient department of the institute were recruited for the study. The CONSORT statement guidelines have been followed in reporting the outcomes of the study.

Subjects - A total of 30 patients diagnosed with hearing loss as per WHO Hearing loss classification criteria were recruited from patients visiting the outpatient department. **Inclusion Criteria**: Clinical features of *Badhirya*, Mild to moderate hearing loss (26 to 40 dB and 41 to 55 dB), Age group 18 to 60 years, irrespective of sex, occupation, Controlled diabetic patient

Exclusion Criteria: Infective diseases like Encephalitis, Herpes, Mumps etc., Systemic disorders like uncontrolled diabetes mellitus, hypertension, known cases of aural tumours, polyps, chronic suppurative otitis media, tympanic membrane perforation.

Patient Selection- Patients diagnosed with hearing loss criteria were selected from O.P.D. of the Department of *Shalakya Tantra*, irrespective of their sex, occupation, religion, education etc. A total of 30 patients were registered for the study. Performa was prepared for the elaboration of all aspects of the

disease in Ayurvedic and modern parlance. Written consent was taken from all the patients registered for the trial.

Research Design -The study was a randomized controlled clinical trial. And Audiometry was done on the day of enrollment and the last day of study (45^{th} day).

Intervention:

All the patients were randomly divided into two groups: group A and group B. Group A (n = 15) received *Musali churna* 3gm two times per day while Group B (n =15) received *Sarivadi vati* 1 tablet three times per day Both groups received their respective interventions with water after food intake. *Musali churna* was prepared in GMP approved local institutional Pharmacy, as per standard procedures. *Sarivadi vati* were procured from UNJA Pharmacy. The duration of intervention was 45 days with follow-up on every 15th day. (Total 3 follow ups in periods of 45 days). The nature and design of the study were explained to patients, and informed consent was obtained. The study was approved by the Institutional Ethics Committee. CTRI Registration Number – CTRI/2018/07/014722. The collection of Data was from November 2018 to February 2020. During the study, patients were asked to adhere to the treatment protocol and report any adverse events to the investigators at the earliest. Any manifestations either existing or new during the intervention that cause considerable distress were screened for possible adverse events.

Table 1: Groups and Intervention

GROUPS	SAMPLE SIZE	DRUGS	DOSE	DURATION	FOLLOWUP
GROUP I **Trial group**	15 patients	***Musali Churna***	3gm two times/day with water	45days	0^{th} day 15^{th} day 30^{th} day 45^{th} day
GROUP II **Control group**	15 patients	***Sarivadi Vati***	1 tablet 3 times/ day	45 days	0^{th} day 15^{th} day 30^{th} day 45^{th} day

Anupana- Jala

Investigations- Pure tone audiometry, Random blood sugar (if needed)

Assessment criteria- Assessment were done on the basis of improvement in Pure tone Audiometry findings.

Statistical analysis- Statistical analysis was carried out using SPSS Version 20.0. The effect of therapy within the groups is assessed by applying "paired t test" with respect to audiometry value showed highly significant results in both the groups with p value <0.001. Between the groups **"**Unpaired t test" with respect to audiometry value showed significant results with a p value <0.001.

Results:

Table 2: Subject characteristics

OBSERVATIONS	NO. of PATIENTS				TOTAL	%
	Group A		Group B			
	No.	%	No.	%		
Age (yr)- 20-30	2	13.33%	2	13.33%	4	13.33%
31-40	2	13.33%	3	20%	5	16.66%
41-50	7	46.66%	9	60%	16	53.33%

51- 60	4	26.66%	1	6.66%	5	16.66%
Gender- Male	6	40%	5	53.33%	11	36.33%
Female	9	60%	10	46.67%	19	63.33%
Irregular Food habits- Absent	9	60%	12	80%	21	70%
Present	6	40%	3	20%	9	30%
Occupation-Home maker	2	13.33%	2	13.33%	4	13.33%
Labourer	6	40%	5	53.33%	11	36.66%
Students	2	13.33%	2	13.33%	4	13.33%
Office worker	2	13.33%	5	53.33%	7	23.33%
Weaver	3	20%	1	6.66%	4	13.33%
Tinnitus- Present	12	80%	8	53.33%	20	70%
Absent	3	20%	7	46.66%	10	30%
Habits- Tea/Coffee	8	53.33%	6	40%	14	46.66%
Alcohol	3	20%	2	13.33%	5	16.66%
Smoking	2	13.33%	4	6%	6	20%
None	2	13.33%	3	5%	5	16.66%
Socioeconomic status- Upper middle	1	6.66%	1	6.66%	2	6.66%
Middle	10	66.66%	12	80%	22	73.33%
Lower	1	6.66%	00	00%	1	3.33%
Lower middle	3	20%	2	13.33%	5	16.66%

Effect of interventions on audiometry readings, Expressed in Mean and standard deviations (S.D.) Within the group paired t test with respect to audiometry value showed statistically significant results with P value <0.001

Table 3: Within the groups

Groups	Treatment	Mean	SD	t value	p-value
Trial group	BT	33.15	7.28	8.892	<0.001
	AT	29.32	6.86		
Control group	BT	30.87	7.89	11.560	<0.001
	AT	27.97	7.22		

Between the groups, unpaired t test with respect to audiometry value showed statistically non-significant results.

Table 4: Between the groups

	GROUP 1		GROUP 2		T VALUE	P VALUE
	MEAN	SD	MEAN	SD		
BT	33.15	7.89	30.89	7.28	0.813	0.423
AT	29.32	7.22	27.97	6.86	0.523	0.605
BT - AT	3.83	1.28	2.92	1.22	1.98	0.057

SUB ANALYSIS:

1. Decibel improvement- Among 30 patients, the result showed that there were 3(10%) patients who got an improvement of 0-1.99 dB, 20(66.66%) got an improvement of 2–3.99db, 04(13.33%) got an improvement of 4 – 5.99 dB., 02(6.66%) got an improvement of more than 6 dB. The readings are shown below.

Table 5: Effect of therapies on decibel improvement

DB IMPROVEMENT	Group A	%	Group B	%	Total	%
0-1.99 dB	03	20%	01	6.66%	03	10%
2-3.99 dB	11	73.33%	09	60%	20	66.66%
4-5.99db	00	00%	04	26.66%	04	13.33%
>6db	01	6.66%	01	6.66%	02	6.66%

Group A- In terms of decibels out of 15 patients, the result showed that there were 3 (20%) patients who got an improvement of 0-1.99 dB, 11 (73.33%) got an improvement of 2 – 3.99db, 01(6.66%) got an improvement of more than 6 dB. **Group B-** In terms of decibels, out of 15 patients result showed that there were 1 (6.66%)patients who got an improvement of 0-1.99 dB, 09 (73.33%) got an improvement of 2 – 3.99db, 04(26.66%) got an improvement of 4 – 5.99 dB, 01(6.66%) got an improvement of more than 6 dB.

2. Severity of hearing loss-

Table 6: Severity of hearing loss [based on hearing loss in decibels]

Severity	Group A	%	Group B	%	Total	%
Mild to normal	09	60%	07	46.66%	16	53.33%
Mild to mild	03	13.33%	04	26.66%	07	23.33%
Moderate to mild	01	6.66%	03	13.33%	04	13.33%
Moderate-moderate	01	6.66%	01	6.66%	02	6.66%

Group A - Audiometric result showed that there were 12 patients suffering from mild hearing loss, out of which 03 remained mild while another 09 came under the normal hearing range.

Before the trial 02 patients had hearing loss of moderate degree and after treatment 01 patients turn into mild hearing loss while 01 remained moderate.

Group B- Audiometric result showed that there were 10 patients suffering from mild hearing loss, out of which 04 remained mild while another 07 came under the normal hearing range.

Before the trial 04 patients had hearing loss of moderate degree and after treatment 03 patients become mild while 01 remained moderate.

DISCUSSION

Discussion is the part of a research that will give illumination about findings. In the current study, there were two groups and both of them had the same sample size that is 15 in each group, so all of them completed the study and obtained results and statistical analysis is discussed with various aspects.

Effect of drug on impaired hearing

In Group A

Sarivadi Vati contains many drugs like *Lohabashama*, which is indicated in *kshaya*, and we can use it as a *rasayana* [7]. *Abrakhabhasma* is a *Pradnya bodhi*, which helps in increasing perception of *gyana* through *indriyas*, and it helps in decreasing *indriyasosha* that enhance the working capacity of *indriyas*, so it will help in nourishing *karna indriya* [8]. It contains drugs like *Yashtimadhu*, *Kushta* which are known to have *Srotoshodhana* effect [9]. Hence it is mentioned in *Bhaishjyaratnavali* in *Karna Roga Adhikara*. Many of the drugs like *Bringaraj* also possess neurotronic properties hence it used in Degenerative ear disorder[s] [10]. *Sariva, Yastimadhu*, are responsible for *Indriya tarpana* because of their *madhura rasa* [11].

In Group B: *Krishna musali* (*Curculigo orchioides*) is an amusing source of phytochemicals like flavonoids and polyphenol, all of these are believed to demonstrate neuroprotective effect[s] [12].

Mode of Action of trial drug can be explained on the basis of the fact that the drug having pharmaco-therapeutic opposite to the particular *dosha*, result in the pacification of that particular *dosha* – *"Vishesha Siddhanta"* [13], The vitiation of *vata* is the major

factor in the development of the disease. In the management of *Badhirya Vatashamak* and *Shroto Shodaka drayas* are generally advised [14]. *Musali churna* have *Vatashamak* properties, thus this drug pacifies *vatadosha* which is mainly responsible for the disease *Badhirya*. Drug *musali* has *rasayana, balya* and *brimhana* properties thus it can prevent old age and degenerative changes in the cochlea and nerve in *Badhirya* [15]

Discussion on decibel improvement

The improvement in frequency of 500, 1K, 2K was more considerable than related to 4k, 6k, 8k. this happens because the distribution of hair cells and also a response to treatment from ear to ear was not the same. Some ears showed good results and some of them maintain the same hearing ability without any further deterioration.

CONCLUSION

The present study showed that *Musali Churna* produced significant improvement and was effective in *Badhirya*. *Musali churna* and *Sarivadi vati* have shown efficacy in *Badhirya* condition and both groups were comparable.

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