

Role of Mushliadi Churna & Bilva Taila in the Management of Badhirya (Deafness)



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Abstract

The enormous problem of deafness is well known and among the major ailments, causing suffering to large number of patients throughout the world. Although modern techniques related to medical knowledge has developed into the most advanced stages, but ailments such as deafness have still remained satisfactorily unanswered. Therefore for the present clinical study deafness was selected to find medication that is suitable, acceptable and have easy compliance; from the ancient texts. The main problem associated with the disease is hearing loss which ranges from mild to profound or total. A vast number of factors such as familial deafness, presbycusis, and infections, autoimmune and metabolic disorders and last but not the least the ever increasing noise pollution are sources of this ailment. Presently, for the management of deafness; medical, surgical and hearing aids are available but their effectiveness remains questionable as they have lots of side-effects, limitations and very high failure rate. Therefore, to find an answer for the cure of deafness Ayurvedic texts were gone through and the disease which is similar it, as per aetiopathogenesis and clinical features is discovered to be badhirya. Thus the management of badhirya, through the formulations as mentioned in ayurvedic text were selected for the present clinical research work. The medications in present study were used through local and oral route. These types of administration have synergistic potentiated super additive effect. As deafness has general as well as local etiological factors to its origin, therefore two routes of drug administration were selected for the eradication of the deafness. Mushliadi churna was selected for oral use and Bilva taila for local use as Karnapura. Moreover, as these drugs also have rasayana properties, their routine use can also prevent the deafness occurring due to noise pollution or as a result of increasing age. These will also improve the immunity of the body to combat other causative factors. Thus, the medications used for the management of deafness (badhirya) will not only cure but will also help to prevent the deafness.

Keywords: Audiometry, Anupana, Badhirya, Bhrama, Bilva taila, Deafness, Hearing loss, Mushliadi churna, Trial group.

Introduction

Modern medicine, which is supposed to be the most advanced and highly scientific system, has failed to provide to cure for a variety of health problems. Thus vast numbers of people are turning to alternative medical sciences, especially Ayurveda, so that relief can be attained. Among such problems Deafness is a major health hazard.

On the basis of clinical features and pathogenesis, deafness can be correlated with the disease Badhirya mentioned in ancient texts. The study of ancient medical literature reveals that the disease Badhirya attracted Ayurvedic pioneers considerably. Acharya Sushruta has mentioned it as the disease entity under karna rogas. Acharya Charaka included it under the 80 Nanatmaja vata vikara and Acharya Vaghbhatta has described Badhirya, a complication of karna nada, karna kashveda and karna shula. It is fact that a systemic description of karna roga is available in all the ancient texts.

If an average, normal man on the street has the choosing which he would rather be, deaf or blind, he would probably say he would prefer deafness as the lesser affliction, but those who have studied the deaf and the blind generally agree that deafness is more debilitating and more damaging to the personality structures than is blindness. Compensations are more readily available for blindness than for deafness.

Marked degree of devastating damage is done to those children who suffer from familial deafness as they are unable to acquire wide and varied knowledge of sound or ability of speech. Even more important,

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sound patterns acquired up to this time have not had the chance to become imprinted in the mind firmly enough to leave a lasting impression and the damage wipes the slate clean. The result is an almost complete inability to hear and speak, which becomes plainly noticeable to the parents when the child is of few years of age. Such a child is baffled by his ineffective attempts to make his wants known and to interpret the wishes of others. He behaves badly and becomes very hard to manage. He is at a great disadvantage when with normal hearing children; he cannot be accepted at a regular school.

The loss of hearing with age, the presbycusis, is the commonest affection of the hearing mechanism. Hearing loss can also occur due to viral infection, multiple sclerosis, syphilis, drug toxicity, carbon monoxide poisoning, blood dyscrasia, lead poisoning, anaemia, diabetes, nephritis and metabolic diseases. Noise pollution is one of the primary sources of problem for hearing loss. The ever increasing din to which most of us are exposed in everyday life constitutes a potential hearing hazard; constant exposure to loud noises is a well known cause of labyrinthine deafness.

The treatment modalities of deafness include medical, surgical and hearing aid. The medical treatment includes nasal decongestants and antibiotics which instead of curing the disease lead to altered manifestations. The microsurgical procedures too have poor acceptance due to failure of surgery, cost of surgery and other complications related to surgery.

The hearing aid which is the third measure to combat impaired hearing, has its limitations too and the benefit obtained in the hearing level by wearing a hearing aid leaves much to be desired. Only appropriate aids for the patient's hearing loss, correctly used will provide any benefit. Moreover hearing aids do not produce normal hearing. Ironically of any hundred people urged to try hearing aids, it is doubtful that one would reach a hearing level comparable to the level of vision usually fitted with glasses; probably 50% would find that even though hard of hearing and in need of help they have too much hearing of a hearing aid, that they hear fully as well or even better without the instrument in almost all situations. Or they might find that even the least amount of volume was invariably excessive. A few would discover that their hearing was so severely impaired that wearing a hearing aid could not improve it at all.

In spite of the development of a large number of diagnostic techniques, conservative, surgical and hearing aids measures for combating deafness, the disease has still remained peculiar due to poor acceptance of these measures because of their drawbacks as mentioned earlier. Therefore, an eminent necessity is felt for obtaining a better solution for the management of deafness, the drugs were selected from the materia medica of traditional Indian medicine.

Aims and objectives of the present Study

- Complete exploration of the original Ayurvedic texts with special references to badhira.

- To understand aetiopathogenesis of badhira (Deafness) in accordance with those laid down in Ayurvedic texts and also in the modern texts.
- To evaluate the effectiveness of Ayurvedic therapeutic formulations scientifically.
- To come forward with standard ayurvedic management of deafness.

Material & Methods

➤ Patient selection

Patient attending the OPD and IPD of Department of Shalakra Tantra, H.P.G.I.P.G.E.& R.A, Hospital, with signs and symptoms of badhira (deafness) were registered irrespective of their sex, occupation, religion, education etc. A total of 25 patients were registered for the study. Performa was prepared for elaboration of all aspects of the disease on Ayurvedic and modern parlance.

Written consent was taken from all the patients registered for the trial.

➤ Sampling technique

A total of 25 registered patients were divided into three groups. In Trial Group-I (TG-I), eight patients were treated with Mushliadi Churna orally. In Trial Group-II (TG-II), eight patients were treated with Bilva Taila locally as Karnapura. In Trial Group-III (TG-III), nine patients were administered Mushliadi Churna orally and Bilva Taila locally as Karnapura.

➤ Exclusion Criteria

Patients suffering from congenital deafness and genetic S.N.H.L. were excluded from the clinical trial.

➤ Investigations

Following investigations were carried out to assess condition of the patient. The patients having other pathologies were excluded from the study.

- Routine haematological examinations-Hb gm%, T.L.C, D.L.C, ESR, Blood sugar, Blood urea, Serum creatinine.
- Complete urine examination, sugar and albumin.
- Radiology.
- Hearing tests-Voice test, Tuning fork tests, Audiometry.

➤ Dosage of drugs

In TG-I :Mushliadi churna-2gm BD, Anupana-Madhu(honey)

In TG-II :Bilva taila-6-10 drops BD(as Karnapura)

In TG-III: Mushliadi churna-2gm BD, Anupana-Madhu(honey)

Bilva taila-6-10 drops BD (as Karnapura)

Duration of trial-The trial of therapy was carried out for eight weeks. Patients were assessed weekly.

Assessment criteria-Grading and scoring system was adopted for assessing each associated sign and symptom before the commencement of the trial and relief obtained after completion of the clinical trial. The overall score of each associated sign and symptom was recorded as below.

General symptom score:

- Absence of a sign or symptom-0
- Presence of a sign and symptom in mild degree-1

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- Presence of a sign and symptom in moderate degree-2
- Presence of a sign and symptom in severe degree-3
- Presence of a sign and symptom of very severe degree-4

The overall result was adjudged in terms of relief obtained in associated signs and symptoms:

Cured- 100% relief in subjective as well as objective symptoms.

Markedly improved- More than 50% relief in subjective & objective symptoms.

Improved- 25% to 50% relief in subjective & objective symptoms.

Unchanged- Less than 25% relief in subjective & objective symptoms.

Statistical analysis

The effect of therapy in the three groups is assessed by applying paired student *t*-test. The results obtained are considered highly significant for $P < 0.001$, significant for $P < 0.01$, and insignificant for $P < 0.05$. The statistical intergroup comparison study was done by applying Bonferroni multiple comparison tests.

Observations

Among the total of 25 patients enrolled, 8 patients (32%) belonged to 41-50 years of age group, 7 patients (28%) belonged to the age group of 60-70 yrs, 4 patients (16%) belonged to 31-40 yrs of age and 3 patients each (12%) belonged to 51-60 yrs and 20-30 yrs of age group. Comparatively more incidences of badhriya, in the age group of 41-50 years, can be attributed to the degenerative changes during this period of life.

Out of 25 patients, 15 patients i.e. 60% were males while 10 patients i.e. 40% were females. It is known fact that male population is more exposed to the addictions like smoking, alcohol, tobacco chewing etc. than their female counterparts. These are the known triggering factors for the development of deafness.

Out of the total 25 patients, 22 patients (88%) were married compared to 3 patients (12%) which were unmarried. As the Hospital is situated in rural area marriages are performed in young age. Thus majority of the patients are married.

A total of 23 patients (92%) belonged to rural areas while 2 patients (8%) were from urban areas.

Maximum number of 9 patients (36%) was labourers, 6 patients were housewives, 4 each were (16%) govt.servants and students, 2 (8%) were businessmen. The higher incidence of prevalence of deafness in labourers may be explained on the basis of more exertionous nature of work and proneness to the trauma and many times work under noisy atmosphere. These factors causes vitiation of vata, which is responsible for causing deafness.

Most of the patients i.e. 10 (40%) belonged to lower socio-economic strata, 9 patients (36%) were categorised as poor and 6 patients (24%) were of higher middle class.

In the present study majority of the patients (76%) were hard working whereas remaining patients (24%) were having sedentary life style.

A total of 15 patients i.e. 15 (60%) were having vata-pittaj prakriti followed by 6 patients (24%) having vata kaphaj prakriti and 4 patients (16%) having pitta kaphaj prakriti. Thus the study proves that vata and kapha dosha are prominent in badhriya.

Distribution of patients according to working atmosphere shows that 19 patients (76%) were having quiet working atmosphere whereas six patients (24%) were having noisy working atmosphere. The presence of large number of patients under the quiet working atmosphere is due to the fact that research institution is located in the region which is free from noise pollution. Six patients (24%) belonged to noisy industrious atmosphere and as the noise pollution is one of the aetiological factors of badhriya, the presence of 24% of patients working under noisy atmosphere cannot be ignored.

Among the total of 25 patients enrolled, maximum number of the patients i.e. is 23 (92%) were having negative family history whereas only two patients (8%) had positive family history. This is because of the facts that, in the present study mainly those patients were registered who were not suffering from genetic/hereditary type of deafness.

Majority of the patients i.e. 80%, included in the present clinical study suffered from vataj type of badhriya. Five patients (20%) were suffering from vata-kaphaja type of badhriya.

Among the total 25 patients registered in the present study, 20 patients (80%) belonged to sensorineural deafness while 5 patients (20%) suffered from conductive type of deafness. This is due to the fact that emphasis has been laid on this particular type of badhriya in the present study and thus maximum number of patients were registered suffering from this particular type.

Inner ear lesion was present in 20 patients (80%) while the site of lesion in the remaining 5 patients was middle ear. As most of the patients registered, suffered from Sensorineural deafness, inner ear lesion was present in majority of the patients.

Majority of the patients i.e. 14 (56%) had chronicity of 1-2 years followed by 4 patients having chronicity of more than 10 years. Three patients were having chronicity of 3-4 years. Chronicity of 5-6 years was present in two patients while one patient each suffered from chorincity of less than one year and of 7-8 years respectively. The presence of large number of patients with chronicity of 1-2 years, shows that awareness of the medical advice about the disease is well known as ear is the most important organ concerned with perception of sense and it is impossible to carry out daily routine work efficiently without its proper functioning.

In 19 patients (76%) of the cases, onset of deafness was gradual and in the remaining 24% of the patients, the onset was sudden.

Among the total 25 patients, maximum number of 23 patients (92%) suffered from bilateral type of deafness while only 2(8%) patients suffered from unilateral deafness.

According to nidana sevana majority of the 7 patients (28%) the aetiological factor was presbycusis induced deafness. While in 6 patients (24%) nidana

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Table 2-Incidence of signs and symptoms of 25 patients of Badhirya (Deafness)

Signs and symptoms	No. of patients			Total	Percentage
	TG-I	TG-II	TG-III		
Karna Shula	5	6	7	18	72
Karna Nada	6	5	6	17	68
Karna Srava	2	2	1	5	20
Bhrama	4	6	4	14	56
Karna Kandu	5	5	6	16	64

Discussion

Regarding effect of therapies on subjective symptoms

Karna shula

In TG-I a relief of 71.26% was demonstrated, in TG-II it was 72.99% and in TG-III, it was 60.24%. The relief was statistically very significant in TG-II and TG-III, whereas in TG-I, it was statistically significant. Maximum improvement in case of karna shula was presented by TG-II followed by TG-I and TG-III respectively.

Karna Nada

The improvement in karna nada was 64.5% in TG-III, 41.33% in TG-I and 33.15% in TG-II was statistically very significant, while it was statistically significant in TG-II. Maximum improvement in case of karna nada was found in TG-III followed by TG-I and TG-II respectively.

Karna srava

Trial group I demonstrated a relief of 33.33%, while TG-II showed a relief of 19.35% and in TG-III there was a relief of 33.33% in karna srava. The relief was statistically insignificant in all the three groups.

Bhrama

Bhrama was relieved by 62.5% in TG-III. In TG-I it was reduced by 49.6% and in TG-II by 35.3%. The improvement was statistically very significant in TG-I, TG-II and TG-III. TG-III showed maximum improvement, followed by TG-I and TG-II respectively.

Karna kandu

The improvement in Karna kandu was 81.75% in TG-I, 66.66% in TG-II and 64.51% in TG-III. Improvement in all the trial groups was statistically very significant. Maximum relief from karna kandu was found in TG-I followed by TG-II and TG-III respectively.

Table 3-Effect of Therapies on Signs and Symptoms of 25 patients of Badhirya (Deafness)

Signs and symptoms	Relieved after Therapy					
	TG-I		TG-II		TG-III	
	%	p	%	p	%	p
Karna Shula	71.26	< 0.02	72.99	< 0.003	60.24	> 0.001
Karna Nada	41.33	<0.005	33.15	<0.02	64.51	<0.006
Karna Srava	33.33	>0.005	19.35	>0.17	33.33	>0.17
Bhrama	25	>0.05	35.37	<0.001	62.5	<0.02
Karna Kandu	81.75	<0.003	66.66	<0.009	64.51	<0.004

was noise induced. The aetiological factor in 5 patients was infection; and trauma in another three patients. While two patients (8%) each suffered from deafness because of smoking and ototoxicity respectively. Ageing has been considered as an important aetiological factor of badhirya as it causes dhatu kshneeta.

Presence of associated signs and symptoms shows that 18 patients (72%) had karna shula as symptom. 17 patients (68%) had karna nada whereas 5 patients (20%) had symptom of karna srava. Out of total 25 patients 56% patients showed the symptom of bhrama, while 64% of the patients presented with the symptom of karna kandu. In the present clinical study, emphasis was laid on the vataj type of badhirya, the majority of the patients were registered with symptoms of vata prakopa such as karna shula, karna kandu, karna nada and bhrama whereas patients having karna srava (symptom of mainly vata-kaphaj type of badhirya) were mainly not registered in the present research work.

Table 1- General observation wise distribution of 25 patients of Badhirya (Deafness)

Observation	No. of patients			Total	%
	TG-I	TG-II	TG-III		
Age group (41-50 years)	2	3	3	8	32
Sex (male)	4	5	6	15	60
Marital status (Married)	6	8	8	22	88
Habitat (Rural)	7	7	9	23	92
Occupation (Labourer)	4	3	2	9	36
Financial status (L.M.C)	3	4	3	10	40
Educational status (upto matric)	3	3	4	10	40
Dietary habit (mixed)	6	8	7	21	84
Life style (Active)	6	5	8	19	76
Prakriti (Vata-pittaj)	6	4	5	15	60
Working atmosphere (Quiet)	6	5	8	19	76
Family history (negative)	7	7	9	23	92
Type of Badhirya (Vata)	6	6	8	20	80
Type of Deafness (Sensori-neural)	6	6	8	20	80
Site of lesion (Internal)	6	6	8	20	80
Chronicity (1-2 years)	5	5	4	14	56
Onset (Gradual)	6	6	7	19	76
Laterality (Bilateral)	7	8	8	23	92
Nidan sewana (Presbycusis)	2	3	2	7	28

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deaf while two remained moderately severe deaf. Severe deafness was present in one patient and who was improved to moderately severe after treatment.

➤ **Regarding effect of therapies on Audiometric results in different groups**

In TG-I, audiometric result showed that there were two patients suffering from mild deafness, out of which one remained mild while another was cured. Prior to the trial three patients had deafness of moderate degree and after treatment two patients became mild while one remained moderate. One patient was moderately severe and remained in the same category after treatment. Two patients had severe degree of deafness and remained in the same category after treatment.

Table 4-Effect of Trial Drug on Audiometric Results and their percentage in TG-I

S.No	Percentage according AAOO formula		Category of Severity	
	BT	AT	BT	AT
1.	65	58	Severe	Severe
2.	32	23	Moderate	Mild
3.	86	83	Severe	Severe
4.	60	58	Mod.Severe	Mod.Severe
5.	25	19	Moderate	Mild
6.	2	0	Mild	Cured
7.	15	8	Mild	Mild
8.	32	32	Moderate	Moderate

In TG-II, audiometric results showed that one patient had mild degree of deafness before treatment and remained mild after treatment. Three patients were suffering from moderate degree of deafness prior to the trial, out of which two patients became mild after the completion of the trial while one remained in the same category. One patient presented with moderately severe degree of deafness and remained in the same category after treatment. Three patients were suffering from severe degree of deafness, out of which two showed improvement and became moderately severe while one remained severe after treatment.

Table 5-Effect of Trial Drug on Audiometric Results and their percentage in TG-II

S.No	Percentage according AAOO formula		Category of Severity	
	BT	AT	BT	AT
1.	26	20	Moderate	Mild
2.	71	62	Severe	Mod.Severe
3.	15	14	Severe	Severe
4.	24	24	Moderate	Moderate
5.	52	49	Mod.Severe	Mod.Severe
6.	7	6	Mild	Mild
7.	69	65	Severe	Mod.Severe
8.	26	20	Moderate	Mild

In TG-III, audiometric results showed that one patient had mild degree of deafness before treatment and was cured after treatment. Three patients were present in the category of moderate deaf, out of which two became mild after treatment while one remained in the same category of moderate deafness. Four patients were moderately severe deaf prior to the trial, out of which two became moderate

Table 6-Effect of Trial Drug on Audiometric Results and their percentage in TG-III

➤ **Regarding comparative study of Audiometric**

S.No	Percentage according AAOO formula		Category of Severity	
	BT	AT	BT	AT
1.	13	11	Severe	Mod. Severe
2.	26	20	Moderate	Mild
3.	53	50	Mod.Severe	Mod. Severe
4.	30	26	Moderate	Mild
5.	26	21	Mod.Severe	Moderate
6.	63	52	Mod.Severe	Mod.Severe
7.	24	22	Mod.Severe	Moderate
8.	43	36	Moderate	Moderate
9.	2	0	Mild	Cured

results in different groups

Audiometric results showed improvement with statistically with very significant t values of 4.02, 3.4 and 4.6 in TG-I, TG-II, TG-III respectively. Though comparison of different groups showed insignificant difference of audiometric results in all the three groups (P<0.05), however maximum improvement in audiometric results was obtained in TG-III followed by TG-I and TG-II respectively.

Table 7-Effect of Trial Drugs on Audiometric Results in term of grades in Trial groups TG-I, TG-II, TG-III.

Trial group	Mean Score of Audiometric results		Difference in mean score	t	P(<)
	BT	AT			
TG-I	39.62	35.12	4.5	4.02	0.002
TG-II	36.25	32.5	3.75	3.41	0.005
TG-III	31.11	26.44	4.66	4.66	0.01

Discussion on overall results

TG-I

Out of the total eight patients, one patient (12.5%) was completely cured; two patients (25%) got mild results while five patients (62.5%) patients showed no relief.

TG-II

Out of total eight patients, four (50%) patients showed mild improvement and four (50%) showed no relief. No patient showed moderate or complete cure.

TG-III

In Trial Group III, one patient (11.11%) was cured. No patient showed moderate improvement, five (55.56%) patients presented with mild improvement and three (33.33%) patients had no relief.

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Table 8-Overall Result of medication in the patients in different Trial groups

Trial group	Results	No. of Patients	Percentage
TG-I	Cured	1	12.5%
	Moderate	-	-
	Mild	2	25%
	Not Cured	5	62.5%
TG-II	Cured	-	-
	Moderate	-	-
	Mild	4	50%
	Not Cured	4	50%
TG-III	Cured	1	11.11%
	Moderate	-	-
	Mild	5	55.56%
	Not Cured	3	33.33%

➤ **Discussion on overall combined results**

Overall combined result of 25 patients of Badhriya (deafness) in the trial groups TG-I, TG-II and TG-III showed that two patients (8%) were cured. No patient showed moderate improvement. Mild improvement was demonstrated by eleven (44%) while 12 patients (48%) showed no improvement.

Table 9-Overall combined Result of medication in the patients in different Trial groups

Results	TG-I		TG-II		TG-III	
	No. of Patients	% of Relief	No. of Patients	% of Relief	No. of Patients	% of Relief
Cured	1	12.5%	-	-	1	11.11%
Moderate	-	-	-	-	-	-
Mild	2	25%	4	50%	5	55.56
Not Cured	5	62.5%	4	50%	3	33.33

➤ **Mode of Action of Trial Drugs**

Mode of Action of trial drugs can be explained on the basis of the fact that the drug having pharmaco-therapeutic property similar to the qualities of a particular dosha, provoke/ vitiate that particular dosha, and the drug having pharmaco-therapeutic properties, opposite to the particular dosha, result in pacification of that particular dosha.

Table 10-Pharmaco-therapeutic properties of various ingredients of Mushliadi Churna

Dravya	Rasa	Guna	Virya	Vipaka	Dosh karma
Shweta Mushli	Madhur	Guru, Snigdha	Sheeta	Madhur	Vata-Pitta Shaman
Bakuchi	Katu-Tikta	Laghu, Ruksha	Ushna	Katu	Kapha-Vata Shaman

Table 11-Pharmaco-therapeutic properties of various ingredients of Bilva Taila

Dravya	Rasa	Guna	Virya	Vipaka	Dosh karma
Bilva	Kshaya-Tikta	Laghu, Ruksha	Ushna	Katu	Kapha-Vata Shaman
Til Taila	Madhur	Guru, Snigdha	Ushna	Madhur	Vata Shaman (mainly) & Tridosh shaman
Ajakshira	Kshaya-	Laghu	Sheeta	Madhur	Kapha-Vardak

	Madhur				
Gaumutra	Katu-Tikta-Kshaya	Laghu, Tiktsna	Ushna	Katu	Kapha-Vata Shaman

The vitiation of vata is the major factor in the development of the disease. In the management of badhriya vata-kapha shamak and shrotoshodaka dravas are generally advised. Mushliadi churna and bilva taila both have 100% VATA SHAMAK PROPERTIES. Thus both these drugs pacifies vata dosha which is mainly responsible for the disease badhriya.

Both the drugs showed significant relief in almost all the symptoms and signs of badhriya, which indicates towards the vata-kapha shamak, sotha-hara and vedanasthapana and sodhana properties of the selected drugs.

Drug mushli has rasayana, balya and vrihan property thus it can prevent the old age and degenerative changes in the cochlea and nerve in badhriya. Bakuchi has nadi balya, sotha hara, vranashodan and rasayana properties.

Bilva has sotha-har, vedana sthapana and nutritive action and tila has karna shulaha, vata shamak and nadi balya properties.

As badhriya is produced by provocation of vayu and akasha mahabhuta, these drugs were able to perform the samprapti-vighatan of the disease and thus alleviate it.

Thus both the trial drugs can relieve associated signs and symptoms of badhriya and can prevent associated degenerative changes and therefore effective in the treatment of badhriya.

Conclusion

- The therapies of the present clinical trial have definitive effect on subjective symptoms as karna shula, karna nada, Bhrama and karna kandu.
- The therapies showed their effect on audimetric results as well indicating objective improvement or cure of the Badhriya.
- Mushliadi churna and Bilva taila are found to be most effective in TG-III, in which both were administered as combination therapy. It is due to synergistic supraadditive (Potentiation) effect, which increases the efficiency of the medication.
- Though the results were very encouraging with these drugs but as the duration of the treatment was short, therefore long duration studies on large number of patients is recommended for evaluation and analyzing the results.

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