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Efficacy of *Usheera Hima* in Palmo-plantar Hyperhidrosis

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ABSTRACT

Swedapanayana / Swedahara are the terminologies commonly found in *Ayurvedic* literature for those *Dravya* which are said to have role in *Swedahara Karma*. *Usheera* (*Vetiveria zizanoides (*Linn.) Nash) is one such drug which possess *Swedahara Karma*. The roots are used and it possess *Swedahara Karma* due to Sheeta *Virya, Madhura Vipaka* and *Tikta Madhura Rasa*. Palmo-plantar Hyperhidrosis is a disorder characterized as perspiration in excess of the body's physiological need and can significantly impact one's occupational, physical, emotional and social life. It is a relatively common disorder, affecting nearly 3% of the population, with the highest prevalence rates among those aged 18 to 54 years. *Hima kalpana* is one among *Panchavidha Kashaya kalpana* and it possess *Sheetavirya, Mruduguna* and it is *Pittasamaka*. *Usheera* is given in the form of *Hima kalpana*.

Key Words: *Swedahara Karma; Hima kalpana; Usheera; Palmoplantar Hyperhidrosis*

INTRODUCTION

Ayurveda presents unique concept of *Mala* i.e the excretory product of the body should also be considered as essential constituents of living body and they also perform some useful functions to support the body. After digestion, the food digested is separated into *Saara bhaga* (nutrient part) and *Kitta* (waste). The *Kitta bhaga* includes *Shakrit, Sweda, Mutra* and even abnormal forms of *Tridosha* and *Saptadhatu (Dhatu mala)*[1]. After expulsion of *Sthula mala (Shakrit, Sweda* and *Mutra*) and *Sukshma mala* or *Dhatu mala* total detoxification of body takes place. *Sweda* being one among *Trimala,* helps in *Kledha vridhi*[2](moisturizes the skin), *Saukumarya krit*(make skin soft and smooth) also maintains the body temperature in normalcy. *Sweda* is the *Dhatu mala* of *Meda dhatu* and the roots of channels used for excretion of *Sweda* is *Meda* and *Loma kupa*[3]. *Swedavaha srotodushti* results in symptoms like *Asweda, Atisweda, Atiparushya* etc[4], *Pitta Prakriti*[5-6] and *Vyana avruta praana*[7] also causes *Atisweda*. The concept of *Atisweda* can be referred to Hyperhidrosis in *Ayurveda*. Hyperhidrosis is a disorder characterized as perspiration in excess of the body's physiologic need and can significantly impact one's occupational, physical, emotional and social life[8-9]. It's of two types primary and

secondary hyperhidrosis. Primary hyperhidrosis is distinguished as a chronic, idiopathic disorder of excessive perspiration in a bilateral, symmetrical manner[10]. Primary hyperhidrosis has been associated with the hyperactivity of the sympathetic nervous system and can affect the palm and soles which is known as Palmo-plantar hyperhidrosis[11].

Usheera(*Vetiveria zizaniodes Nash* Linn) is a drug described in *Brihatrayi*, *Laghutrayi* as well as in *Nighantu*. *Charaka* mentions it in *Dahaprashamana varga*[12], *Sushrutha* in *Pittasamshamana gana* and many *Nighantu* included it under *Sarivadi varga*, which indicates the drug as its action on *Pitta Dosha* and *Vata Dosha* which is mainly responsible for *Pitta Prakopa*, *Swedavaha sroto dushti* and *Vyanaavruta Praana* and resulting in *Atisweda*. *Hima kalpana* is a simple preparation where the drugs in coarse powder form are kept soaked in water in a ratio of 1:6 for a stipulated time period to facilitate the transfer of water-soluble active principles from drug to the liquid media. These preparations will usually have *Sheetavirya* and *Mruduguna*. Drugs with volatile principles are preferred. These preparations are *Pitta shamaka*, *Hridya* and *Sadyah santarpaka*[13]. *Charaka* in *Agrya Prakarana* mentions the external application of *Usheera (Vetiveria zizaniodes Nash* Linn*)* for *Atisweda*[14]. So far such a study to assess the efficacy of *Usheera* in the form of *Hima* given internally is not conducted in Palmo-plantar Hyperhidrosis. Hence the study is undertaken to find out scientific evidence to the practice.

OBJECTIVE

- To evaluate the *Swedahara Karma* of *Usheera Hima* in Palmo-plantar hyperhidrosis.

METHODS

In the present study, *Swedahara Karma* of *Usheera Hima* was evaluated in 30 samples of Palmo-plantar Hyperhidrosis based on Diagnostic criteria, Inclusion criteria and Exclusion criteria.

Intervention : *Usheera Hima*

Diagnostic criteria : The diagnosis was made on the basis of Hyperhidrosis Disease Severity Scale.

DIAGNOSTIC CRITERIA[15]

Hyperhidrosis disease severity scale

1. Sweating is never noticeable and never interferes with daily activities

2. Sweating is tolerable but sometimes interferes with my daily activities

3. Sweating is barely tolerable and frequency interferes with my daily activities

4. Sweating is intolerable and interferes with daily activities

a) 1 b)2 c)3 d)4

these numbers indicate how responses should be scored. A score of 3 or 4 indicates severe hyperhidrosis .A score of 1 or 2 indicates mild or moderate hyperhidrosis.

SPECIAL TEST[16]

Starch-Iodine test: An Iodine solution is applied to the skin and allowed to air dry. After drying starch is sprinkled. When sweat reaches the surface of the skin the starch and iodine combined causes color

change (yellow to dark blue) allowing sweat production to be actively visualized.

INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria

Fulfilling diagnostic criteria – hyperhidrosis disease severity scale

Special test

Chronicity less than 5 years

18 to 54 years

Selected irrespective of gender, religion

Exclusion criteria - Subjects with any other systemic disorders

Alcohol abuse

Subjects with endocrine disorders

Pregnant women

ASSESSMENT CRITERIA

Subjective Parameters:-

- Assessment of subjective parameters was done based on symptoms.
- Assessment of subjective parameters were done on 1st day, 7TH day, 14th day, 21st day, 30th day & AT.

Objective parameters:-

- Assessment of objective parameter was based on the changes in the laboratory parameters – Blood routine
- Assessment of objective parameters were BT and AT

RESULTS

i. Based on signs and symptoms

ii. Based on Blood routine

BASED ON SIGNS AND SYMPTOMSEFFECT OF THERAPY ON FREQUENCY OF SWEATING (WEEKLY)

Table 1 Repeated measure ANOVA test showing the effect of Usheera Hima in Sweating (frequency of sweating weekly)

Parameter Frequency of sweating (weekly)	N	MEAN	Greenhouse – geisser			Greenhouse-geisser error Df	Remarks
			Df	F Value	P value		
BT		5.233					
7TH DAY		5.200					
14TH DAY	30	4.533	1.846	60.875	**0.000**	53.532	**S**
21ST DAY		3.700					
30TH DAY		3.000					
AT		5.367					

Table 2 Pair wise comparison of frequency of sweating(weekly) with Bonferroni correction (P value 0.008)

(I) Frequency of sweating(weekly)	(J)	Mean difference (I-J)	Std. error	Sig.	95% confidence interval for difference		Remarks
					Lower	Upper	
BT	**Day 7**	**0.033**	**0.033**	**1.000**	**-0.073**	**0.140**	**NS**
	Day 14th	**0.700***	**0.128**	**0.000**	**0.290**	**1.110**	**S**
	Day 21st	**1.533***	**0.202**	**0.000**	**0.888**	**2.179**	**S**
	Day 30th	**2.233***	**0.248**	**0.000**	**1.441**	**3.025**	**S**
	AT	**-0.133**	**0.063**	**0.651**	**-0.335**	**0.069**	**NS**
DAY 7	**BT**	**-0.033**	**0.033**	**1.000**	**-0.140**	**0.073**	**NS**

	Day 14th	0.667*	0.130	0.000	0.251	1.082	S
	Day 21st	1.500*	0.213	0.000	0.819	2.181	S
	Day 30TH	2.200*	0.260	0.000	1.369	3.031	S
	AT	-0.167	0.084	0.860	-0.436	0.103	NS
DAY 14	BT	-0.700*	0.128	0.000	-1.110	-0.290	S
	Day 7th	-0.667*	0.130	0.000	-1.082	-0.251	S
	Day 21st	0.833*	0.145	0.000	0.371	1.295	S
	Day 30th	1.533*	0.218	0.000	0.835	2.232	S
	AT	-0.833*	0.136	0.000	-1.269	-0.397	S
DAY 21	BT	-1.533*	0.202	0.000	-2.179	-0.888	S
	Day 7th	-1.500*	0.213	0.000	-2.181	-0.819	S
	Day 14th	-0.833*	0.145	0.000	-1.295	-0.371	S
	Day 30th	0.700*	0.153	0.001	0.211	1.189	S
	AT	-1.667*	0.194	0.000	-2.286	-1.047	S
DAY 30	BT	-2.233*	0.248	0.000	-3.025	-1.441	S
	Day 7th	-2.200*	0.260	0.000	-3.031	-1.369	S
	Day 14th	-1.533*	0.218	0.000	-2.232	-0.835	S
	Day 21st	-0.700*	0.153	0.001	-1.189	-0.211	S
	AT	-2.367*	0.227	0.000	-3.094	-1.640	S
AT	BT	0.133	0.063	0.651	-0.069	0.335	NS
	Day 7th	0.167	0.084	0.860	-0.103	0.436	NS
	Day 14th	0.833*	0.136	0.000	0.397	1.269	S
	Day 21st	1.667*	0.194	0.000	1.047	2.286	S
	Day 30th	2.367*	.227	.000	1.640	3.094	S

The applied test Repeated measure ANOVA with Greenhouse – Geisser correction determined that mean of the Frequency of Sweating(weekly) differed statistically significant between time points (F= 60.875, P =0.000). Treatment elicited non-significant difference in Frequency of sweating (weekly) from BT to 7th day by 0.033 (p value 1.000), there was significant improvement from BT to 14th day by .700(p value0 .000), a further improvement from BT to 21st day by 1.533(p value0.000), from BT to 30th day there was a significant reduction in frequency of sweating with a mean difference of 2.233, from BT to AT there was statistically non-significant decrease by -0.133 (p value0.651).On the whole from BT to 30th day there was a significant reduction in Frequency of sweating (weekly) with a mean difference of 2.233.

EFFECT OF THERAPY ON FREQUENCY OF SWEATING (PER DAY)

Table 3 Repeated measure ANNOVA test showing the effect of Usheera Hima on Frequency of sweating (per day)

Parameter Frequency of sweating (per day)	N	MEAN	Greenhouse – geisser df	F Value	P value	Greenhouse-geisser error Df	Remarks
BT		4.067					
DAY 7		4.200					
DAY 14		3.567					
DAY 21		2.833					
DAY 30		2.400					

AT	**4.367**					
	30	**2.233**	**37.771**	**0.000**	**64.770**	**S**

Table 4 Pair wise comparison of frequency of sweating (per day) with Bonferroni correction p value (0.0083)

(I) Frequency of sweating(per day)	(J)	Mean difference (I-J)	Std. error	Sig.	95% confidence interval for difference		Remarks
					Lower	Upper	
BT	**Day 7**	-0.133	0.133	1.000	-0.560	0.293	NS
	Day 14th	0.500	0.171	0.100	-0.048	1.048	NS
	Day 21st	1.233*	0.213	0.000	0.553	1.914	**S**
	Day 30th	1.667*	0.200	0.000	1.028	2.305	**S**
	AT	-0.300	0.109	0.150	-0.648	0.048	NS
Day 7	**BT**	0.133	0.133	1.000	-0.293	0.560	NS
	Day 14th	0.633*	0.176	0.018	0.070	1.196	NS
	Day 21st	1.367*	0.256	0.000	0.548	2.185	**S**
	Day 30th	1.800*	0.251	0.000	0.997	2.603	**S**
	AT	-0.167	0.118	1.000	-0.545	0.212	NS
Day 14	**BT**	-0.500	0.171	0.100	-1.048	0.048	NS
	Day 7th	-0.633*	0.176	0.018	-1.196	-0.070	NS
	Day 21st	0.733*	0.172	0.003	0.182	1.285	NS
	Day 30th	1.167*	0.173	0.000	0.612	1.721	**S**
	AT	-0.800*	0.162	0.000	-1.318	-0.282	**S**
Day 21	**BT**	-1.233*	0.213	0.000	-1.914	-0.553	**S**
	Day 7th	-1.367*	0.256	0.000	-2.185	-0.548	**S**
	Day 14th	-0.733*	0.172	0.003	-1.285	-0.182	NS
	Day 30th	0.433*	0.104	0.004	0.101	0.765	NS
	AT	-1.533*	0.213	0.000	-2.215	-0.852	**S**
Day 30	**BT**	-1.667*	0.200	0.000	-2.305	-1.028	**S**
	Day 7th	-1.800*	0.251	0.000	-2.603	-0.997	**S**
	Day 14th	-1.167*	0.173	0.000	-1.721	-0.612	**S**
	Day 21st	-0.433*	0.104	0.004	-0.765	-0.101	NS
	AT	-1.967*	0.217	0.000	-2.661	-1.273	**S**
AT	**BT**	0.300	0.109	0.150	-0.048	0.648	NS
	Day 7th	0.167	0.118	1.000	-0.212	0.545	NS
	Day 14th	0.800*	0.162	0.000	0.282	1.318	**S**
	Day 21st	1.533*	0.213	0.000	0.852	2.215	**S**
	Day 30th	1.967*	0.217	0.000	1.273	2.661	**S**

Repeated measure ANOVA with Greenhouse – Geisser correction determined that mean of the Frequency of Sweating (per day) differed statistically significant between time points (F= 37.771, P = 0.000). Treatment elicited non-significant difference in Frequency of sweating (per day) from BT to 7th day by -0.133 (p value 1.000), from BT to 14th day by 0.500 (p value 0.100), there was statistically significant improvement from BT to 21st day by 1.233 (p value 0.000), from BT to 30th day there was a significant reduction in frequency of sweating with a mean difference of 1.667(p value 0.000), from BT to AT there was statistically non-significant decrease by -.300 (p value 0.150).On the whole from BT to 30th day there was a significant reduction in Frequency of sweating(per day) with a mean difference of 1.667.

SWEATING INTERFERES WITH DAILY ACTIVITIES

Table 5 Cochran's Q test showing the effect of Usheera Hima on sweating interferes with daily activities in 30 Patients

Sweating interferes with daily activities	*Value*		*N*	*Cochran,s Q*	*P value*	*Remark*
	yes	*no*				
BT	30	0	30	21.563[a]	0.001	S
Day 7	29	1				
Day 14	27	3				
Day 21	25	5				
Day 30	22	8				
AT	29	1				

BT – Before treatment, AT- After treatment, S-Significant NS- Non Significant N – Number of subject

Table 6 Mc Nemar's test showing the effect of Usheera on sweating interferes with daily activities

Parameter	Negative charge	Positive charge	P value	Remarks
BT– Day 7	0	0	1.000	NS
Day7- Day 14	1	0	0.500	NS
Day 14-Day 21	2	1	0.625	NS
Day 21-Day 30	5	0	0.250	NS
Day 30-AT	0	8	0.039	NS
AT – BT	0	1	1.000	NS

BT – Before treatment, AT-After treatment, S- Significant NS- Non Significant N – Number of subjects

There was statistically significant difference in Sweating interferes with daily activities with Cochran's test value 21.563 at P value 0.001. Post hoc with Mc Nemars showed that there was no statistical significant difference in Sweating interferes with daily activities between BT and 7th Day, 7th day and 14th day, 14th Day and 21st Day, 21st Day and 30th day, 30th Day and AT, AT and BT.

SWEATING DUE TO EMOTIONAL DISTURBANCE

Table 7 Friedman's test showing the effect of Usheera hima on emotional disturbance in 30 Patients of Palmoplantar Hyperhidrosis

Emotional disturbance	*N*	*Mean Rank*	*X^2*	*P*	*Remarks*
BT	30	2.97	72.769	0.000	**S**
7th Day		2.97			
14th Day		3.17			
21st Day		4.07			
30th Day		4.87			
AT		2.97			

Friedman's test, BT= Before treatment, AT= After treatment, N=Number of patients, X^2=Chi-square value, P=P value, S=Significant

Table 8 Wilcoxon sign rank test showing the effect of Usheera Hima on sweating due to emotional disturbance

Parameter	*Negative ranks*			*Positive ranks*			*Ties*	*Total*	*Z*	*P*	*Remarks*
Emotional disturbance	N	MR	SR	N	MR	SR			*Value*	*Value*	
BT-7th D	0[a]	0.00	0.00	0[b]	0.00	0.00	30[c]	30	0.000[b]	1.00	NS
7TH -14th D	0[d]	0.00	0.00	2[e]	1.50	3.00	28[f]	30	-1.414[c]	0.157	NS
14th – 21st D	0[g]	0.00	0.00	9[h]	5.00	45.00	21[i]	30	-3.000[c]	0.003	NS
21st D-30th D	0[j]	0.00	0.00	8[k]	4.50	36.00	22[l]	30	-2.828[c]	0.005	NS
30th D-AT	19[m]	10.0	190.00	0[n]	0.00	0.00	11[o]	30	-4.359[d]	0.000	**S**

AT-BT	0^{p}	0.00	0.00	0^{q}	0.00	0.00	30^{r}	30	0.000^{b}	1.000	NS

BT – Before treatment, AT-After treatment, S- Significant NS- Non Significant N – Number of subjects

There was statistically significant difference in Sweating during Emotional disturbance with Friedman's test value 72.769 at P value 0.000. Post hoc with Wilcoxon sign rank test showed that there was no statistical significant difference in Sweating interferes with daily activities between BT and 7th Day, 7th day and 14th day, 14th Day and 21st Day, 21st Day and 30th day, AT and BT. It was observed that there was statistically significant difference in Sweating during Emotional disturbance between 30th day and AT with p value 0.000 in all 11 subjects.

EFFECT OF USHEERA HIMA ON BLOOD ROUTINE

Table 9 Effect of Therapy on Haemoglobin percentage in 30 patients of Palmo-plantar Hyperhidrosis

Parameter	Mean		Mean Diff	SD(±)	SE(±)	T	P	Remarks
	BT	AT						
Haemoglobin	**13.796**	**13.453**	**0.3430**	**0.9295**	**0.1697**	**2.021**	**0.105**	**NS**

Haemoglobin: In 30 patients of Palmo-plantar Hyperhidrosis, Haemoglobin was 13.796 gm% before treatment and it decreased to 13.453gm% after 30 days of treatment with decrease of .3430 gm%. The decrease in the value is not statistically significant. (P 0.105)

Table 10 Effect of Therapy on Total WBC count in 30 patients of Palmo-plantar Hyperhidrosis

Parameter	Mean		Mean Diff	SD(±)	SE(±)	T	P	Remarks
	BT	AT						
Total WBC count	**8763.33**	**8313.33**	**450.000**	**1908.375**	**348.420**	**1.292**	**0.207**	**NS**

Total WBC count: In 30 patients of Palmo-plantar Hyperhidrosis, Total WBC count was 8763.33 cells/cmm before treatment and it decreased to 8313.33 cells/cmm after 30 days of treatment with decrease of 450.000 cells/cmm. The decrease in the value is not statistically significant. (P 0.207)

Table 11 Effect of Therapy on ESR in 30 patients of Palmo-plantar Hyperhidrosis

Parameter	Mean		Mean Diff	SD(±)	SE(±)	t	P	Remarks
	BT	AT						
ESR	**14.67**	**12.17**	**2.500**	**14.061**	**2.567**	**0.974**	**0.338**	**NS**

ESR count: In 30 patients of Palmo-plantar Hyperhidrosis, ESR count was 14.67 mm/hr before treatment and it decreased to 12.17 mm/hr after 30 days of treatment with decrease of 2.500mm/hr. The decrease in the value is not statistically significant. (P 0.338)

Table 12 Effect of Therapy on Platelet count in 30 patients of Palmo-plantar Hyperhidrosis

Parameter	Mean		Mean Diff	SD(±)	SE(±)	t	P	Remarks
	BT	AT						
Platelet count	**3.2300**	**3.2103**	**0.1967**	**0.56323**	**0.10283**	**0.191**	**0.850**	**NS**

Platelet count: In 30 patients of Palmo-plantar Hyperhidrosis, Platelet count was 3.23 lakhs/cmm before treatment and it decreased to 3.2103 lakhs/cmm after 30 days of treatment with decrease of 0.1967 lakhs/cmm. The decrease in the value is not statistically significant. (P .850)

Table 13 Effect of Therapy on RBC count in 30 patients of Palmo-plantar Hyperhidrosis

Parameter	Mean		Mean Diff	SD(±)	SE(±)	t	P	Remarks
	BT	AT						
RBC count	4.9940	4.8900	0.10400	0.44562	0.08136	1.278	0.211	NS

RBC count: In 30 patients of Palmo-plantar Hyperhidrosis, RBC count was 4.994 million/cmm before treatment and it decreased to 4.89 million/cmm after 30 days of treatment with decrease of 0.104 million /cmm. The decrease in the value is not statistically significant. (P .211)

DISCUSSION

BASED ON RESULTS

Effect of Usheera Hima on frequency of sweating (weekly) (Table 1 & 2)

There was a statistically significant difference on Frequency of Sweating(weekly) at P value .000. Before treatment 10 patients had 4 times sweating, 7 patients had 5 times and 6 patients had 6 times. At the end of the therapy it was reduced to 4 times in 7 patients, 5 times in 11 patients and 6 and 7 times in 6 patients respectively.

Primary Palmo-plantar Hyperhidrosis is caused due to overactivity of the sympathetic cholinergic fibers passing through the upper dorsal sympathetic ganglia at T2-T3 causes abnormal innervation of the eccrine glands responsible for sweat secretion resulting in subsequent vasoconstriction and cooling of skin.

Effect of Usheera Hima on frequency of sweating (per day)(Table 3 & 4)

There was a statistically significant difference on Frequency of Sweating (per day) at P value .001. Before treatment 8 patients had 3 times sweating, 13 patients had 4 times,8 patients had 5 times and 1 patient had 6 times sweating. At the end of the therapy it was reduced to 1 time in 1 patient, 2 times in 17 patients, 3 times in 11 patients and 4 times in 1 patient.

Effect of Usheera Hima on sweating interferes with daily activities (Table 5&6)

There was statistically significant difference in sweating interferes with daily activities at P value.001. Before treatment all 30 patients had interference of sweating with daily activities. At the end of the therapy 8 had no interference of sweating with daily activities.

Hyperhidrosis is characterized as perspiration in excess of the body's physiological need and it significantly impact on social, occupation, physical, emotional and social life.

Effect of Usheera Hima on sweating due to emotional disturbance(Table 7 & 8)

There was a statistically significant difference on Emotional disturbance at (p value .000). Before treatment 29 patient had sweating due to emotional disturbance, at the end of the therapy 10 presented with sweating due to emotional

disturbance , 19 had reduction in sweating due to emotional disturbance.

Emotional disturbance (anxiety, tension, fear) can aggravate the condition. When emotional disturbance is present, over activity of sympathetic nervous system is involved which results in production of acetylcholine and sweating is observed. Based on Blood routine parameters

Effect of Usheera Hima on Haemoglobin (Table 9)

Treatment elicited a NON-significant improvement in Haemoglobin % from BT to AT at p value 0.104Thus there is no significant improvement in Haemoglobin % from BT to AT

Effect of Usheera Hima on WBC count(Table 10)

Treatment elicited a NON-significant improvement in Total WBC COUNT from BT to AT at p value 0.207.Thus there is no significant improvement in Total WBC COUNT from BT to AT

Effect of Usheera Hima on ESR count(Table 11)

Treatment elicited a NON-significant improvement in ESR count from BT to AT at p value 0.338. Thus there is no significant improvement in ESR COUNT from BT to AT

Effect of Usheera Hima on Platelet count(Table 12)

Treatment elicited a NON-significant improvement in Platelet COUNT from BT to AT at p value 0.850.Thus there is no significant improvement in Platelet COUNT from BT to AT

Effect of Usheera Hima on RBC count(Table 13)

Treatment elicited a NON-significant improvement in RBC count from BT to AT at p value 0.211.Thus there is no significant improvement in RBC count from BT to AT.

Treatment did not produce any changes on Blood routine parameters, thus elicited a non- significant improvement on Blood routine parameters

For proper diagnosis of Primary Hyperhidrosis history followed by physical examination is required. For secondary hyperhidrosis, the diagnosis is through physical examination and detailed laboratory evaluations are required to identify the organic pathology.

Probable mode of action of *Usheera Hima*

Swedadhikyatha/ Atisweda can be caused due to Involvement of *Pitta Dosha*[5,6,17], Swedavaha Srotho dushti[18-19], Shonita dushti[20,21] and *Avarana (Vyanavrutta Prana)*[7], the *Doshas* involved are *Pitta* and *Vata along with Rakta Dhatu and Sweda(mala)*. The drug *Usheera* possess *Tikta Madhura rasa*, *Laghu Snigdha guna*, *Madhura vipaka* and *Sita virya*. Its *Doshakarma* is *Vatapitta Shamaka*, *Vatahara* due to *Madhura vipaka*. *Pitta Shamaka* due to *Sita virya*, *Madhura vipaka* and *Tikta Madhura rasa*[22]. As the drug is *Pitta shamaka*, it does *Shamana* of *Rakta Dushti* and also *Swedavaha sroto dushti*, because *Pitta dosha* is the mala of *Rakta Dhatu* and *Sweda* is said to be *Pitta sthana*.

Usheera is given in the form of *Hima Kalpana*, it is one among *Panchavidha Kashaya kalpana*. It is also called *Sheeta Kashaya* and does *Pitta Shamana*[23]. Thus the Dosha involved being Pitta and Vata , the drug as well as *Hima Kalpana* does

the *Shamana* of *Pitta* and *Vata*. Hence the *Swedahara Karma* of drug is interpreted. The main cause for Primary Hyperhidrosis is hyperactivity of sympathetic nervous system, which produces acetylcholine which results in binding with muscarinic receptors and results in vasodilation and cause sweating[24]. Most common medication used in excessive sweating are anticholinergics[25].In one of the study, it is proven that Acetate, ethanol and aqueous extract of *Vetiveria zizanoide*s at a dose of 500mg/ kg prevented the rise in AchE levels[26]. Hence the probable mode of anticholinergic action of *Vetiveria zizanoides* might have reduced the levels of AchE levels and it might result in reduced sweating. Hence the probable mode of anticholinergic action of *Vetiveria zizanoides* might have reduced the levels of AchE levels and it might have resulted in reduced sweating.

CONCLUSION

Administration of *Usheera Hima* in the dosage of 50 ml (twice daily - morning and evening) before food for 30 days reduced the symptoms of Hyperhidrosis – Frequency of sweating (weekly), frequency of sweating (per day), sweating during emotional disturbance. The signs and symptoms relapsed once the medicine was stopped, 15 days after treatment again the symptoms of Hyperhidrosis recurred with same or increased frequency of sweating (weekly, per day) as that of before treatment. The drug didn't show any statistical difference in blood routine (Hb%, ESR, Total WBC count, Platelet count & RBC count) after 30 days of treatment.

Hyperhidrosis can be understood as *Atisweda*. The administration of *Usheera Hima* (50ml) twice daily (morning and evening) before food for 30 days was found to be effective in Palmoplantar Hyperhidrosis. Hence *Swedahara Karma* of *Usheera Hima* in Palmo-plantar Hyperhidrosis in this study is justified.

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