



Case Series

EFFECTIVENESS OF AYURVEDIC *BASTI CHIKITSA* IN THE MANAGEMENT OF *PRAMEHA POORVAROOPAVASTHA* WITH SPECIAL REFERENCE TO PREDIABETES

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ABSTRACT

Prameha is a *Santarpanotha vyadhi* i.e., disease caused due to abnormal increase in body tissues. Various factors which vitiate *Kapha* dosha like *Avyayama* (sedentary lifestyle), Consuming *Guru* (heavy), *Snigdha* (unctuous), *Madhura* (sweet) food, *Atinidra* (excessive sleep) are responsible for causing *Prameha*. In *Prameha*, the *Dravata* (fluidity), *Abaddhata* (flaccidity) of *Kapha Dosha* and *Dhatu* abnormally increases and the patient passes large amount of turbid urine. Ayurvedic classics have described symptoms of *Prameha poorvaroopavastha* or prodromal stage of *Prameha*. *Prameha* is a broad Ayurvedic concept that includes a condition comparable to Diabetes Mellitus. Diabetes mellitus is a metabolic non communicable disease with rising prevalence. It is associated with significant complications affecting vital organs. Prediabetes is the prodromal stage of diabetes. Most people with Prediabetes develop diabetes in future. Hence it is important to diagnose patients at prediabetic stage and treat them. The *Poorvaroopavastha* of *Prameha* can be compared to Prediabetic condition for the purpose of effective diagnosis and treatment. In this study, initially the symptoms of *Prameha poorvaroopavastha* such as *Atisweda* (excessive sweating), were used to categorize patients as prediabetic. Prediabetic blood sugar levels were further confirmed by means of laboratory investigation. 5 patients fulfilling these criteria were allotted for the study. A *Kala Basti krama* (15-day medicated enema treatment) with *Rasnadi niruha* and *Anuvastana Basti* was given to the patients. During this period no internal medication was given. Marked improvement was observed in subjective criteria (reduction in grades of *Prameha poorvaroopa* symptoms) and objective criteria (reduction in fasting and post prandial blood sugar levels). A maximum of 21.4% reduction in fasting blood sugar level and 22.7% reduction in post prandial blood sugar levels has been observed following the treatment. The drugs used in *Basti* get absorbed via colonic mucosa and enter circulation through large intestine vasculature. *Tikta*, *Katu* (bitter, pungent) drugs used in this *Basti* caused reduction in *Kapha*, absorption of *Kleda* and helped treat the pathogenesis of *Prameha*.

INTRODUCTION

Ayurveda broadly classifies diseases as *Santarpanotha* and *Apatarpanotha vyadhi*. *Santarpanotha vyadhi* are those which are caused by abnormal increase of body tissues and *Apatarpanotha vyadhi* are those caused by abnormal decrease in body tissues. *Santarpanotha vyadhi* are caused due to improper food and lifestyle which result in increase in earth and water elements (*Parthiva* and *Jala*

Mahabhoota)^[1] which form *Kapha Dosha*. These causes include *Cheshtadwesha* (sedentary lifestyle and inactivity), *Shayyasanasukha* (excessive sleep), *Diwaswapa* (daytime sleep), consuming foods which are *Madhura* (sweet), *Guru* (heavy to digest) and of *Snigdha*, *Picchila* (fatty sticky) nature.^[2] *Prameha* is one of these *Santarpanotha vyadhis*^[3]. It is a disease which is caused by all three *Doshas* however predominantly involves vitiation of *Kapha Dosha*. It has been termed as *Mahagada* i.e., a disease which is difficult to treat especially when it is associated with its complications.^[4]

As per the etiopathogenesis of *Prameha*, when a person consumes factors such as *Swapnasukha* (excessive sleep), *Asyasukha* (sedentary lifestyle), *Gudavaikruta* (products of molasses or sweet items),

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Dadhi sevana (consuming milk products like curds) etc., *Kapha dosha* gets vitiated and causes the disease.^[5]

Kapha dosha in its *Prakrutavastha* (normal state) is of *Sthira* (stable), *Picchila* and *Styana* (semisolid) nature. However, in *Prameha* the *Drava* (liquid) *Guna* of *Kapha dosha* increases and this liquid *Kapha* flows in the complete body causing disease. Also, due to *Hetu sevan* (causative factors) ten *Dooshyas* (body tissues) i.e., *Meda*, *Mamsa*, *Vasa*, *Ambu*, *Majja*, *Rasa*, *Rakta*, *Lasika*, *Oja*, *Shukra*, lose their normal constitution and become *Shithila*, *Asamhata* (flaccid) and *Abaddha* (loose). The vitiated *Kapha dosha* combines with these *Vikruta dooshyas* (affected body tissues), circulates in the entire body and pollutes the *Kleda* (moisture or water content) in the body. This vitiated *Kleda* further pollutes the *Mutra* (urine) and causes the main symptom of the disease i.e., *Prabhuta avila mutrata* (excessive turbid urine).^[6] Though this disease pathogenesis mainly involves *Kapha dosha* the other 2 *Doshas* i.e., *Pitta* and *Vata* may also get vitiated due to their own causative factors and cause pathogenesis of the disease. These vitiated *Doshas* combine with vitiated *Dhatu*s, pollute *Mutra* and form 20 subtypes of *Prameha*.

The etiology, pathogenesis, symptoms and clinical features and complications of *Prameha* are similar to diabetes mellitus.

Diabetes mellitus is amongst the top four non-communicable diseases (NCDs). Currently, in India 537 million adults have diabetes with the number expected to rise to 783 million by 2045. Moreover 541 million adults have impaired glucose tolerance.^[7]

It is associated with derangement in insulin hormone which causes glucose metabolism. There is an increase in blood glucose levels due to impaired insulin secretion or responsiveness and impaired glucose tolerance.^[8]

The primary causes of the disease include physical inactivity, excessive intake of sweet carbohydrate rich food, stress and addictions. It is associated with metabolic risk factors like obesity, raised lipid levels and raised blood pressure.^[9] Polyuria, glucosuria, polydipsia, polyphagia, slow wound healing are some of the significant symptoms of this disease. However, it is mainly defined by a specific range of biochemical parameters of fasting blood sugars, post prandial blood sugars and glycosylated haemoglobin levels. This increased glucose level affects almost all the organs of the body including nerves, eyes, blood vessels, heart and kidneys and causes complications like nephropathy, neuropathy and retinopathy.

Prediabetes is a clinical condition in which blood sugar levels are above normal but not high

enough to be called diabetes. It is the prodromal stage of diabetes mellitus.^[10]

Modern science considers prediabetes to be an asymptomatic stage with non-specific symptoms like skin discoloration and excessive urination. It mainly defines the stage by defined ranges of biochemical parameters. Most cases of prediabetes are undetected and progress to diabetes in future.

The global prevalence of impaired fasting glucose and impaired glucose tolerance are expected to increase to 6.5% and 10 % respectively by 2045.^[11]

Hence in order to prevent diabetes and its complications it is important that patients are diagnosed and treated at prediabetic stage. As per a study the risk of cardiovascular events fell by 42% in individuals whose blood glucose levels came back to normal from prediabetic levels which proves that treating patients at prediabetic level may reduce morbidity and mortality.^[12]

As there is similarity between *Prameha* and Diabetes mellitus, prediabetic condition can be compared to symptoms of *Prameha poorvaroopavastha* for effective diagnosis and treatment.

Ayurveda provides a detailed range of symptoms of the *Poorvaroopavastha* (prodromal stage) of *Prameha vyadhi* including symptoms like *Atisweda* (excessive sweating), *Anga durgandha* (foul body odour), *Angagauravta* (heaviness in the body), *Shayyasanawapna sukha* (excessive lethargy and sleepiness).^[13]

Effectiveness of *Prameha Poorvaroopavastha* Symptoms for Diagnosis of Prediabetes– A retrospective study shows significance presence of symptoms of *Prameha poorvaroopavastha* in diabetics as compared to non-diabetics. This proves that these symptoms mentioned in Ayurvedic texts are useful to diagnose prediabetics.^[14]

AIM OF THIS STUDY

The symptoms of *Prameha poorvaroopavastha* along with conventional metabolic parameters can be used to diagnose prediabetes. Ayurveda states *Shatkriya kala* or six stages of pathogenesis of disease. It is said that any disease should be treated in the earliest stage. Hence this study aims to diagnose and treat patients in prediabetic stage so that they do not progress to diabetes.

Treatment Protocol

Ayurveda states that the treatment of *Santarpanottha vyadhi* is *Langhana chikitsa* (treatment causing emaciation)^[15] and *Shodhana* (purification treatment) is the subtype of *Langhana* which is used in conditions of *Bahu shleshma pitta* (excessive *Kapha* and *Pitta dosha*).

In *Prameha chikitsa* also *Shodhana* is mentioned as first line of treatment for *Sthoola rogi* (overweight *Prameha* patients). However, it is not suitable for *Krusha Pramehi* (lean *Prameha* patients).^[16] Hence *Basti chikitsa* (therapeutic enema treatment) can be used as a treatment which causes *Shodhana*, but at the same time does not cause severe *Shodhana* as *Vamana* and *Virechana* or does not cause as many complications as them. ^[17] *Kala basti krama* includes *Niruha* (decoction enema) as well as *Anuvasana basti* (oil enema) which cause *Shodhana* as well as *Vata shaman* (pacification of *Vata dosha*).

Hence *Basti* can be used in *Sthoola* as well as *Krusha prameha* patients.

Basti chikitsa is considered to be a treatment which can be used in all age groups and for all sorts of diseases. It is *Niratyaya* (does not cause major complications). It surrounds all the parts of the body and helps to cure all diseases.^[18]

Niruha basti is known to remove all the *Dosha Chaya* (accumulation of *Doshas*) of the entire body.

In this study patients have been selected as per subjective and objective criteria of *Prameha poorvaroopavastha* and were given *Kala basti krama* with *Rasnadi niruha* and *Anuvasana* for a period of 15 days. *Rasnadi Niruha* and *Anuvasana* contain *Tikta* (bitter), *Kashaya* (astringent), *Katu* (pungent) *rasatmaka* drugs which are excellent for *Ama pachan* and *Kapha Pitta shamana*. Hence this treatment is extremely helpful in treating patients at prediabetic stage.

MATERIALS AND METHODS

Study Design: Case series

Sample Size: 5 patients

Method

5 patients were initially shortlisted based on subjective symptoms of *Prameha poorvaroopavastha*. These patients visited *Panchakarma OPD* for musculoskeletal symptoms. However, the symptoms of *Prameha Poorvaroopa* were found to be present in them after a detailed history was taken.

Detailed case histories of patients were taken and clinical and biochemical examinations were done as follows:

Table 1: Case Histories of Patients

Patient	Age/ Sex	Main Symptoms for which patient visited OPD	Known case of major illness and medication	<i>Prameha Poorvaroopavastha</i> Symptoms found	Grade of the symptom
Case 1	54 Y/F	C/O <i>Ubhaya janusandhishoola</i> since 6 months <i>Chankramane kashtata</i> since 4 months	K/C/O Hypertension since 3 years Rx -Tab Telmaheal 40 mg 1-0-0	<i>Swedadhikya</i> <i>Trushnadhikya</i> <i>Atimootrata</i>	Grade 3 Grade 2 Grade 1
Case 2	48	C/O <i>Katishoola te ubhaya pada shoola and graha</i> since	No known case of	<i>Karapada daha/suptata</i>	Grade 2

Further prediabetic condition was verified by lab investigation of fasting and post prandial blood sugar and patients were enrolled for the treatment.

Inclusion criteria

1. Patients of any gender in the age group of 18-60 years.
2. Patients having fasting blood glucose between 110-125mg/dl and post prandial blood glucose between 140-200mg/dl. ^[19]
3. Patients with grade 0-3 of at least any 3 of the following symptoms of *Prameha poorvaroopavastha* as per who criteria. ^[20]
 - *Swedadhikya* (excessive sweating)
 - *Angagandha*, (foul body odour)
 - *Angagauravta* (sensation of heaviness in the body)
 - *Karapada tala daha* or *Suptata* (feeling of burning or numbness in palms and soles)
 - *Atinidra* (excessive sleepiness including daytime sleep)
 - *Trushnadhikya* (feeling of excessive thirst)
 - *Atimootrapravrutti* (excessive urination)

Exclusion criteria

1. Patients who are contraindicated to take *Basti* like patients with anorectal disorders, symptoms of *Ajeerna* (indigestion), *Udara* (ascites) etc.
2. Pregnant and lactating women.
3. Patients with renal disease.
4. Patients with hyperuricemia (as *Rasnadi Niruha basti* contains *Gomutra*).
5. Patients with any form of malignancy.

Treatment given: Patients were given a *Kala basti krama* with *Rasnadi Niruha* and *Rasnadi Anuvasana basti* for 15 days.

Study duration: 45 days

Patients were assessed for subjective and objective parameters on day 1, day 15 and day 45 of treatment.

Consent- Written informed consent was taken from each patient.

	Y/F	1 year <i>Ubhaya janusandhishoola</i> since 7 months	major illness	<i>Trushnadhikya</i> <i>Atinidra</i>	Grade 1 Grade 3
Case 3	59 Y/M	C/O <i>Ubhaya janu sandhi shoola</i> since 2 years <i>Asane uttishthe kashtata</i> since 4 months	No known case of major illness	<i>Atisweda</i> <i>Karapada daha/suptata</i> <i>Angagandha</i>	Grade 2 Grade 2 Grade 2
Case 4	39 Y/F	C/O <i>Ubhaya janusandhishoola</i> since 6 months <i>Ubhaya janusandhi graha</i> since 1 year	No known case of major illness	<i>Karapadadaha/suptata</i> <i>Angagauravta</i> <i>Atimootrata</i>	Grade 3 Grade 2 Grade 1
Case 5	53 Y/F	C/O <i>Kati te ubhaya pada shoola</i> since 3 months	K/C/O Hyperthyroidism since 5 years Rx- Tab. Neomercazole 5mg 1-0-0	<i>Angagandha</i> <i>Atinidra</i> <i>Angagauravta</i>	Grade 3 Grade 3 Grade 1

Table 2: Patient Ashtavidha Pareeksha (clinical examination) before treatment

	<i>Nadi</i>	<i>Mala</i>	<i>Mutra</i>	<i>Jihva</i>	<i>Shabda</i>	<i>Sparsha</i>	<i>Druk</i>	<i>Akruti</i>
Case 1	<i>Pitta, Kapha</i>	<i>Asamadhankarak</i>	<i>Samyak</i>	<i>Sama</i>	<i>Samyak</i>	<i>Anushna</i>	<i>Mandya</i>	<i>Sthoola</i>
Case 2	<i>Pitta, Vata</i>	<i>Samyak</i>	<i>Samyak</i>	<i>Alpa sama</i>	<i>Samyak</i>	<i>Anushna</i>	<i>Samyak</i>	<i>Sthoola</i>
Case 3	<i>Kapha, Pitta</i>	<i>Samyak</i>	<i>Samyak</i>	<i>Alpa sama</i>	<i>Samyak</i>	<i>Anushna</i>	<i>Samyak</i>	<i>Sthoola</i>
Case 4	<i>Pitta, Kapha</i>	<i>Asamadhankarak</i>	<i>Samyak</i>	<i>Nirama</i>	<i>Samyak</i>	<i>Anushna</i>	<i>Samyak</i>	<i>Krusha</i>
Case 5	<i>Vata, Kapha</i>	<i>Samyak</i>	<i>Samyak</i>	<i>Nirama</i>	<i>Samyak</i>	<i>Anushna</i>	<i>Mandya</i>	<i>Madhyam</i>

Table 3: Blood sugar levels of patients before treatment

Patient	Fasting Blood Sugar	Post Prandial Blood Sugar
Case 1	111	151
Case 2	119	147
Case 3	114	156
Case 4	116	151
Case 5	124	156

Management: *Rasnadi Niruha* and *Anuvasana* are given as *Kala basti krama* for a period of 15 days. This is a *Basti* Formulation mentioned in *Charaka Samhita*^[21].

Kala basti krama of 15 days is mentioned in *Ashtanga hrudaya* and the sequence is.^[22]

Table 4: Day-wise Basti Karma

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15
A	N	A	N	A	N	A	N	A	N	A	N	A	A	A

Rasnadi Niruha basti

रास्नामृता एरण्ड विडंग दार्वी सप्तच्छदोशीर सुराहवनिंबैः। शंपाक भूनिंब पटोल पाठा तिक्ताखुपर्णी दशमूलमुस्तैः॥ त्रान्तिका शिगु फलतत्रिकैश्च क्वाथ सपिण्डीतकतोयमुत्रैः। यष्टाहव कृष्णाफलिनीशताहवा रसांजन श्वेत वचा विडंगः कलिंग पाठाम्बुद सैन्धवैश्च कल्कैः सर्पिमधुतैलमिश्रः॥ अयं निरुहः क्रिमिकुष्ठमेह ब्रध्नोदराजीर्ण कफातुरेभ्यः। रूक्षौषधिरप्यपतर्पितेभ्यः एतेषु रोगेषु अपि दत्सुदतः निहत्य वातं ज्वलनं प्रदीप्य विजित्य रोगांश्च बल करोति॥ च.सि 3/61-64

Rasnadi anuvasana basti – *Rasnadi Taila siddhi* is done with *Rasnadi kwatha*, *Tila taila* and *Rasnadi kalka* contents as per *Sharangdhar Samhita*.

1 part of *Rasnadi Kalka*. 4 parts of *Tila taila* and 16 parts of *Rasnadi kwatha* are mixed and *Taila siddhi* was done till appearance of *Taila siddhi lakshana*.^[23]

Table 5: Details of contents used in *Basti*

<i>Rasnadi Niruha</i>	<i>Kwatha of Rasna, Guduchi, Eranda, Vidanga, Daruharidra, Saptachada, Ushira, Devadaru, Nimba, Aragvadha, Bhunimba, Patola, Patha, Kutki, Dravanti, Dashamoola, Musta, Trayantika, Shigru, Triphala, Madanaphala</i>	550 ml
	<i>Kalka of Yashtimadhu, Pippali, Priyangu, Shatapushpa, Rasanjan, Vacha, Vidanga, Kalinga, Patha, Musta</i>	10 gm
	<i>Til tail</i>	40 ml
	<i>Goghruta</i>	40 ml
	<i>Madhu</i>	30 ml
	<i>Saindhav</i>	5 gm
	<i>Gomutra</i>	10ml diluted with 30ml water
<i>Rasnadi Anuvasana</i>	<i>Taila siddhi with Rasnadi kalka 15gm, Til taila 60ml and Kwatha 240ml</i>	80ml <i>Rasnadi Anuvasana Taila</i>

OBSERVATIONS

After the period of treatment, following changes in subjective and objective parameters were observed in patients.

Table 6: Subjective criteria – Reduction in grades of *Prameha poorvaroopavastha* symptoms

Case 1

	Before	After
<i>Swedadhikya</i>	3 Profuse Sweating after little work and movement	0 Sweating only after heavy work, fast movement and hot weather
<i>Karapada daha/ Suptata</i>	-	-
<i>Trushnadhikya</i>	2 Feeling of moderate thirst >11 times per 24 hours, with water intake 2.5-3 litre/24 hours	1 Feeling of thirst >9 times per 24 hours, with water intake 2-2.5 litre/24 hours
<i>Angagandha</i>	-	-
<i>Atinidra</i>	-	-
<i>Angagauravta</i>	-	-
<i>Atimutrata</i>	1 Passing urine 6-9 times per day, 0-2 times at night	0 Passing urine 3-6 times per day, no/rarely at night

Case 2

	Before	After
<i>Swedadhikya</i>	-	-
<i>Karapada daha/ suptata</i>	2 <i>Karapada tala daha/Suptata</i> continuous but bearable and not severe	1 <i>Karapada daha /Suptata</i> incontinuous, mild, bearable
<i>Trushnadhikya</i>	1 Feeling of moderate thirst >9 times per 24 hours, with water intake 2-2.5 litre/24 hours	0 Feeling of thirst >7 times in 24 hours, with water intake 1.5-2 litres/24 hours
<i>Angagandha</i>	-	-
<i>Atinidra</i>	3 Sleep >10 hours per 24 hours with heaviness	2 Sleep>9-10 hours with heaviness in the

	in the body associated with <i>Tandra</i> (somnolence) <i>Jrumbha</i> (yawning)	body associated with <i>Jrumbha</i> (yawning)
Angagauravta	-	-
Atimutrata	-	-

Case 3

	Before	After
Swedadhikya	2 Sweating after little work and movement	1 sweating only after moderate work and movement
Karapada daha/suptata	2 <i>Kara pada daha/Suptata</i> continuous but bearable and not severe	0 No <i>Karapada daha/Suptata</i>
Trushnadhikya	-	-
Angagandha	2 Strong odour which can be reduced by use of deodorants or perfumes	1 Bad odour but not offensive
Atinidra	-	-
Angagauravta	-	-
Atimutrata	-	-

Case 4

	Before	After
Swedadhikya	-	-
Karapada daha/suptata	3 <i>Karapada daha/Suptata</i> continuous, severe and unbearable	1 <i>Karapada daha/Suptata</i> incontinous, mild, bearable
Trushnadhikya	-	-
Angagandha	-	-
Atinidra	-	-
Angagauravta	2 Frequent feeling of heaviness in the body mildly affecting daily routine	0 No heaviness in the body
Atimutrata	1 6-9 times per day, 0-2 times per night	0 3-6 times per day rarely at night

Case 5

	Before	After
Swedadhikya	-	-
Karapada daha/suptata	-	-
Trushnadhikya	-	-
Angagandha	3 Very strong odour even after using deodorants or perfumes	1 Bad odour but not offensive
Atinidra	3 Sleep >10 hours per 24 hours with heaviness in the body associated with <i>Tandra</i> (somnolence) <i>Jrumbha</i> (yawning)	1 Sleep>8-9 hours per 24 hours with slight heaviness in the body

Angagauravta	1 Mild heaviness in body, daily work not affected	0 No heaviness in the body
Atimutrata	-	-

Table 7: Objective Parameters- Reduction in Fasting and Post Prandial Blood sugar levels

Patient	Fasting Blood Sugar			Post Prandial Blood Sugar		
	Before Treatment	After Treatment	Percentage Improvement	Before Treatment	After Treatment	Percentage Improvement
Case 1	111	98	11.7	151	122	19.2
Case 2	119	110	7.5	147	129	12.2
Case 3	114	106	7	156	127	18.5
Case 4	116	103	11.2	151	125	17.2
Case 5	124	97	21.7	156	121	22.4

Table 8: Associated improvement in musculoskeletal symptoms

Patient	VAS Scale		SLRT		Knee Flexion (in degrees)		Knee Extension (in degrees)		Morning Stiffness (in minutes)		Lumbar Flexion (in degrees)		Lumbar Extension (in degrees)	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Case 1	5	3	-	-	125	130	0	0	15 mins	5 mins	-	-	-	-
Case 2	7	4	R-55 L-60 B/L- 45	R-70 L-65 B/L- 60	-	-	-	-	30 mins	10 mins	80	90	15	25
Case 3	6	4	-	-	130	135	0	0	-	-	-	-	-	-
Case 4	5	2	-	-	110	135	0	0	20 mins	0	-	-	-	-
Case 5	4	2	R-75 L-65 B/L-70	R-90 L-75 B/L- 80	-	-	-	-	-	-	90	90	25	25

RESULTS AND OUTCOMES**Improvement in Fasting Blood Sugar Levels**

More than 20% in 1 patient.

Between 10 and 20% in 2 patients.

Between 1 to 10% in 2 patients.

Improvement in Post Prandial Blood Sugar Levels

More than 20 % in 1 patient.

More than 15 % in 3 patients.

More than 10% in 1 patient.

Improvement in Gradation of Subjective Symptoms

Swedadhikya- Out of 2 patients, one had improvement of 3 grades and the other had improvement of 1 grade.

Karapadadaha or **Suptata**- Out of 3 patients two had improvement of 2 grades and one had improvement of 1 grade.

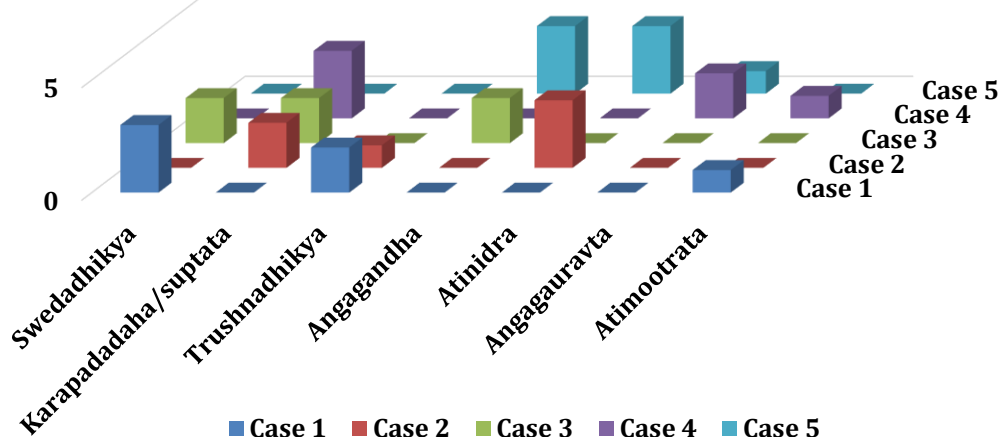
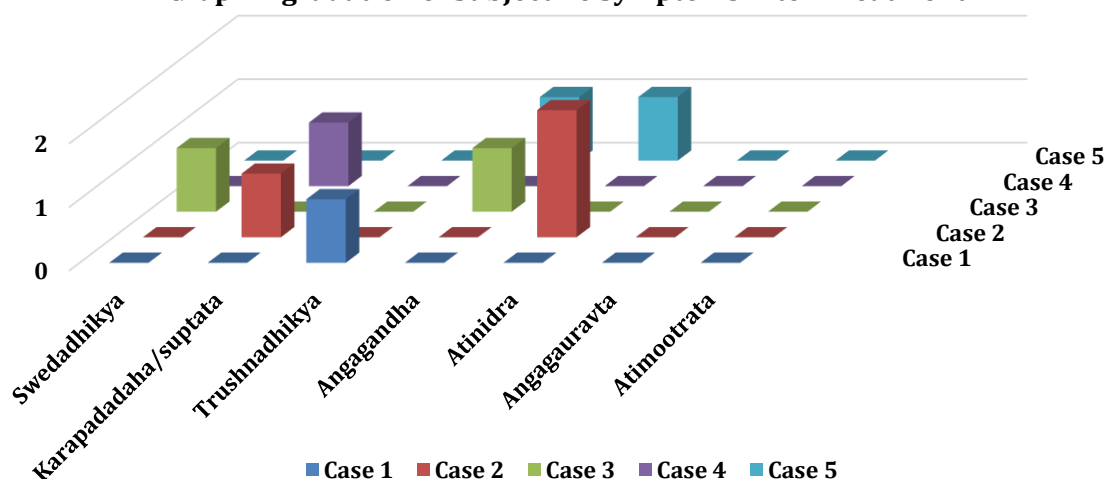
Trushnadhikya - Both patients with *Trushnadhikya* symptom had improvement of 1 grade.

Angagandha - Out of 2 patients, one had improvement of 2 grades and the other had improvement of 1 grade.

Atinidra - Out of 2 patients, one had improvement of 2 grades and the other had improvement of 1 grade.

Angagauravta - Out of 2 patients, one had improvement of 2 grades and the other had improvement of 1 grade.

Atimootrata - Both patients with symptom had improvement of 1 grade.

Graph 1: Gradation of Subjective Symptoms Before Treatment**Graph 2: gradation of Subjective Symptoms After Treatment**

Associated Outcomes in Musculoskeletal Symptoms

Patients also had mild -moderate improvement in musculoskeletal parameters like VAS Scale, SLRT, knee flexion, knee extension, lumbar flexion and lumbar extension.

DISCUSSION

Prameha is a *Kapha pradhana tridoshaja vyadhi*. *Bahu drava shleshma* and excessive *Kleda dosha* are the main sources of pathology in *Prameha*. Moreover, there is *Abaddhata* (liquification) and *Shithilata* (flaccidity) in *Dhatu*.

The *Poorvaroopavastha* of *Prameha* can be compared to prediabetes for the purpose of diagnosis and treatment. The aim of this study is to treat patients at prediabetic level so that they do not progress to diabetes and develop its complications.

As *Prameha* is a *Santarpanottha vyadhi* with *Kapha* predominance, *Langhana* and *Shodhana chikitsa* is indicated for its treatment. However, *Shodhana chikitsa* is unsuitable for *Krusha pramehi* (lean diabetic patient). *Basti chikitsa* is a mild form of *Shodhana* causing less complications and *Balahani* (loss of body strength) as compared to *Shodhana* procedures like

Vamana and *Virechana*. Due to these properties, it was selected for treatment in this study as it could be used for any prediabetic patient.

When *Vata dosha* gets vitiated in *Pramehi rugna* (diabetic patient) causing *Karshya* (emaciation), the prognosis of the disease worsens. [24] It is believed in Ayurveda that any disease occurring anywhere in the body cannot occur without *Vata dosha*. *Basti* is the *Pradhana chikitsa* of *Vata dosha* and hence is considered to be *Ardha chikitsa*. [25]

It can be used to treat all three *Doshas* as per different drug combinations. [26]

बलदोषकालरोगप्रकृती प्रविभज्य योजिताः सम्यक् ।

स्वै स्वैरौषधवर्गैः स्यात् रोगान्निच्छति ॥ च सि 10/4

Moreover, as per Ayurvedic philosophy the main site of formation of *Mootra* (urine) is *Pakwashaya* (large intestine). *Mutravaha nadi* or channels transporting urine fill *Mutra* (urine) in the bladder from *Pakwashaya*. [27]

The *Vata* in *Pakwashaya* and *Basti* is responsible for normal urine.

When this *Vata* is vitiated disorders of *Mutravahasanthana* (urinary system) like *Prameha* are caused. *Basti chikitsa* acts on *Pakwashaya* and *Vikruta vayu* and thus will help in *Prameha*. Following all these principles, *Basti chikitsa* with right choice of drugs is given in *Prameha poorvaroopavastha*.

Rasnadi basti contains drugs which mainly are *Tikta rasatmak* (bitter tasting) and *Katu rasatmak* (pungent tasting) and have *Rooksha* (dry) *Guna*. All these properties help in reducing *Kapha* and *Klesha shoshana*.^[28]

Tikta, Katu, Kashaya rasas are most useful for treating *Kapha dosha* and for absorption of *Kleda*. *Tikta rasatmak* drugs are also the best *Deepan* and *Pachan* drugs. These drugs also have *Rooksha guna* (dry property) which help in *Kleda shoshana* (moisture absorption) in the body.

तिक्तः स्वयमरोचिष्णु अरुचि कृमिर्तृविषम् । कुष्ठ मूर्च्छा

ज्वरोत्क्लेश दाहपित्तकफान् जयेत् ॥ क्लेदमेदोवसा

मज्जाशकृन्मूत्रोपशोषणः । लघुर्मध्यो हिमो रूक्षः

स्तन्यकण्ठविशोधनः । अह.सू.10/ 15-16

कर्तुर्गलामयोदं कुष्ठालसकशोफजित् । व्रणावसादनः

स्नेहमेदक्लेदोपशोषणः ॥ दीपनः पाचनो रुच्यः शोधनो अन्नस्य

शोषणः । छिनति बन्धान् स्रोतांसि विवृणोति कफापहः । अ. हृदय सू. 10/17-1

As per modern science the alkaloids, tannins, glycosides, flavonoids are present in these drugs. These are anti-inflammatory and antioxidant in nature. These drugs given by rectal route cause maximum absorption by colonic mucosa and get directly absorbed in the circulation through intestinal capillaries and avoid metabolism in the liver.^[29]

Tikta rasatmak drugs or bitter tasting drugs have specific receptors distributed across the body. These receptors in the intestine mucosa stimulate production of glucagon like peptide 1 which regulate blood sugar levels. GLP receptors in pancreatic beta and delta cells stimulate release of insulin and somatostatin and hence control blood sugar levels. *Tikta rasatmak* drugs also reduce adipogenic genes and reduce adipocyte formation. They cause reduction in *Medo dhatu*, cause *Karshana* and help reduce body weight.^[30]

Hence, they also help in treating the risk factors of prediabetes i.e., obesity and hyperlipidemia.

CONCLUSION

It can be concluded that *Kala Basti Krama* with *Rasnadi Niruha* and *Anuvasana* shows significant improvement in subjective as well as objective parameters of prediabetes.

The subjective symptoms showed improvement in grades. Objective parameters also showed reduction in values. Patients also found relief in their musculoskeletal symptoms. There were no complications or adverse effects during the treatment. Early ayurvedic management at prediabetic stage may prevent progression of disease without side effect.

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