

Role of *Panchatikta Panchaprasutik Niruha Vasti* in Prediabetes

A case report

Case Report

Poonam V Ashtankar^{1*}, Punam Sawarkar²

1. P.G Scholar, 2. Associate Professor,
Department of Panchakarma, MGACH & RC, Salod (H), Wardha.

Abstract

Background: Prediabetes is an intermediate state of hyperglycemia with glycaemic parameters above normal but below the diabetes threshold. In *Ayurveda*, it is correlated with *Prameha Poorvaroopavastha*. The risk of developing diabetes remains high with an annual conversion rate 5-10%. Many other studies have shown that the efficacy of lifestyle intervention in diabetes prevention with a relative risk reduction of 40-70% in prediabetes adults. If we treat this disease in early stage then it checks the further pathogenesis of disease. **Aim and objectives:** The aim of this study was to observe the efficacy of *Panchatikta Panchaprasutik Niruha Vasti* enema including Palliative treatment in prediabetes. **Methods:** It is a single case study of 55 years old male patient who was diagnosed with prediabetes correlated as *Prameha Poorvaroop* from 1 year approached to *Ayurvedic* hospital and was treated *Panchatikta Panchaprasutik Niruha Vasti*. The treatment was continued for consecutive 15 days. **Results:** After 15days changes were observed in symptoms as well as reduction was seen in blood and urine sugar level and overall quality of life of patient was improved. **Conclusion:** Patient got satisfactory relief in symptoms as well as objective parameters after 15 days.

Key Words: Prediabetes, *Panchatikta Panchaprasutik Niruha Vasti*, *Prameha poorvaroop*.

Introduction

Ayurveda is a holistic science which gives more emphasis over prevention of disease rather than curing of disease. Many clinical entities eg. Diabetes, obesity can be prevented with appropriate Dietetic habit and suitable lifestyle modification. Prediabetes is an intermediate state of hyperglycemia with glycaemic parameters above normal but below the diabetes threshold. The risk of developing diabetes remains high with an annual conversion rate 5-10% (1). In *Ayurvedic* compendium *Prameha* is defined to be characterized with excessive urination (both in frequency & quantity) and turbidity (2). *Prameha* is a *Tridoshaj Kapha* predominant disease (3). Which is included in *Ashtamahagada* (eight types of major diseases) by *Acharya Charaka, Sushruta* and *Vagbhata*. *Prameha Poorvaroopavastha* (prodromal features) explained in our ancient *Samhitas* can be correlated with prediabetes condition. If we manage the disease at an early stage, it will check for further disease pathogenesis. Thus, diagnosis and preventive steps in *Poorvaroopavastha* (fourth *Kriyakala*) (4) are very much appreciated.

Today's eating habits, sedentary lifestyle and genetics can also play role for putting disturbances on

the usual health. Several studies have demonstrated the effectiveness of lifestyle measures in diabetes care with a relative risk reduction of 40-70 per cent in adults. So, there are more chances to develop prediabetes. Type 2 diabetes may develop within 10 years if the prediabetic condition is not controlled by appropriate lifestyle changes. One study found that 5 to 7% weight loss appears to reduce the risk of diabetes (5). Many patients are reluctant to do lifestyle modification and they prefer for specific treatment so they approach for *Ayurvedic* physician. Considering this fact, it is need of hour to search some alternative therapy in *Ayurveda* to check over the pathogenesis of prediabetes to avoid its further progress into diabetes condition.

The main treatment principle in the condition of prediabetes is the elimination of *Kleda* (wetness). *Shodhana Chikitsa* (purificatory treatment) is the best choice of treatment for *Kledaharana* since *Prameha* is *Bahudoshavastajannya Vyadhi* (6). *Vagbhata* has mentioned about 5 types of *Shodhana* (Purgative) treatment modalities which are known as *Panchashodhana* (five penta bio purificatory procedure). *Niruha Vasti* (decoction enema) is one of them (7). Among *Panchakarma Vasti* is such an invasive therapy having multidimensional effect. Among various *Vasti* preparations, *Panchatikta Panchaprasutik Niruha Vasti* is specially narrated for the management of *Prameha* (8). which has cardinal signs and symptoms e.g. *Prabhut Mutrata* (excessive urination), *Ghanangata* (heaviness of body) *Atiswedapravriti* (excessive sweating), *Karapada Daha* (burning sensation in hands and feet) (9). In this case study, a 55-years old man with Prediabetes was prescribed *Panchatikta Panchaprasutik*

* Corresponding Author:

Poonam V. Ashtankar

PG Scholar, Department of Panchakarma,
MGACH & RC,

Salod (H),
Wardha, India

Email Id: drashtankarpoonam@gmail.com

Niruha Vasti along with specific palliative treatment, which showed excellent result as improvement in symptoms as well as reduction in Blood and urine sugar levels.

Material and Methods

It is a single case study. Informed consent was taken from the patient in his own language.

History of present illness

A 55 year old man having Demographic detail mentioned in Table 1. He was apparently well before 1 years. While undergoing his annual checkup, he was diagnosed as prediabetes. So he approached to Panchakarma OPD, Mahatma Gandhi *Ayurved* Medical College Hospital and Research Centre, Wardha, Maharashtra, India for *Ayurvedic* treatment. Considering all clinical symptoms like *Prabhut Mutrata* (excessive urination) from 1 years, *Ghanangata* (heaviness of body) since 1 years, *Ati Swedapravriti* (excessive sweating) present in that patient since 1 years, *Karapada Daha* (burning sensation in hands and feet) since 6 months which are mentioned in Table 2. He had associated symptoms of weight gain since 6-7 years, distention of abdomen since 1-2 years and Itching over inguinal region from 6 months. *Panchatikta Panchprasutik Niruha Vasti* (540ml) was administered to him along with specific palliative treatment (*Chandraprabha Vati*, *Arogyavardhini Vati* and *Gandharva Haritaki Churna*) was prescribed, Without stopping his concomitant medication. *Ashtavidha Pariksha* with vitals examinations are mentioned in Table 3 and 4 respectively.

Table no.1 : Demographic Details

Name:	XYZ
Age:	55 years
Sex:	Male
Address:	Chimur
OPD -	1911150034
Occupation:	Retired PHC worker
Marital status:	Married
Socio- economic status:	Middle class
Weight:	80 kg
Height:	169 cm

Table no. 2 : Chief Complaints with its duration

A.	Chief complaints	Grade	Duration
1	Excessive urination	1 (+)	1 years
2	Heaviness of body	4 (+)	1 years
3	Excessive sweating	2 (+)	1 years
4	Burning sensation in hands and feet	2 (+)	6 months
B.	Associated complaints	Grade	Duration
1	Weight gain	3 (+)	6-7 yrs
2	Distention of abdomen	4 (+)	1-2 yrs
3	Itching over inguinal region	3 (+)	6 month

Table no. 3 : Ashtavidha Parikshana

<i>Nadi</i> (Pulse)	64/min
<i>Mala</i> (Stool)	<i>Saam</i> (Distention of abdomen)
<i>Mutra</i> (Urine)	<i>Asamyak</i>
<i>Jeevha</i> (Tongue)	<i>Alpasaam</i>
<i>Shabda</i> (Speech)	<i>Spashta</i>
<i>Sparsha</i> (Skin)	<i>Anushanasheeta</i>
<i>Druka</i> (Eyes)	<i>Prakruta</i>
<i>Aakruti</i> (Posture)	<i>Shtool</i>

Table no. 4 : Vitals Examination

Blood Pressure (B.P)	140/80mm/Hg
Pulse (P)	64/min
Respiratory Rate (RR)	18/min

Past History

Patient was also known case of hypertension since 10 years with its regular treatment.

Medication History

- Tablet Amlodipine 5 mg daily once For 10 years.

Personal history

- Food habits: mixed diet, craving for Sweet, salty and pungent food items
- Sleep: sound
- Addiction: alcohol (once in a week) and tobacco (twice a day)

Family History

- Father was known case of DM and sibling was obese.

Nidan Panchak (Etiopathogenesis of *Prameha Poorvaroopa* in *Ayurveda*)

- *Hetu* (etiology or causative factors)
- *Ahara*: *Madhur, Lavana, Katu Rasatmak Ahar* (Sweet, salty, and spicy food items)
- *Vihara*: *Asayasukham* (Habituation to sitting on soft cushions for long periods), *Swapnashayan* (excessive sleeping), *Diwaswap* (day sleep)(10)
- *Roopa* (Manifestation) : Excessive urination, heaviness of body, excessive sweating, burning sensation in hands and feet (9).
- *Samprapti* (patho-physiology of the disease): Due to above factors leads to aggravation of *Tridosha*, *Saptadhatu* and *Mansik Dosha* and forms the symptoms of *Prameha Poorvaroopa* (11).

Investigations done

- Blood sugar level
- Urine sugar
- Fasting and Post prandial

Diagnosis

Prediabetes (*Prameha Poorvaroopa*).

Treatment Advised

By analyzing the above pathogenesis of disease in this patient, medicated enema and palliative treatment was prescribed which are shown in table no. 5 and 6 respectively.

Table no. 5 : Shodhana Chikitsa

Shodhana Chikitsa	Drugs			Duration
Abhyanga (Local -lumbar to both foot)	Tila Talia			15 days
Nadi Sweda (Local - lumbar to both foot for 5 minutes)	Nirgundi Patra			15 days
Panchatikta Panchprasutik Niruha Vasti	-Patol (<i>Trichosanthes dioica</i> . Roxb.) -Nimba(<i>Azadiracta indica</i> .Juss.) -Bhunimba(<i>Andrographis paniculata</i> .Linn.) -Rasana (<i>Pluchealanceolata</i> .C.B.Clarke) -Saptaparna(<i>Alstonia scholaris</i> .R.Br.) -Saindhava – 10gm -Madhu – 15ml -Goghrita – 80ml	} 540ml Qwath		Kala Vasti (15 days)

Table no.6 :Shamana Chikitsa

Drugs	Dose	Time of Administration	Anupana	Duration
Gandharvaharitaki Churna	10 gm Hs	After food	Lukewarm water	15 days
Chandraprabha Vati	250mg 2 BD	After food	Lukewarm water	15 days
Arogyavardhini Vati	250 mg 2 BD	After food	Lukewarm water	8 days

Observation and Results

After treatment, the patient had found significantly relief symptoms such as excessive urination, heaviness of body, excessive sweating and burning sensation in hands and feet and . There was significant result that 3 kg weight loss was observed after treatment . Assessment of the patient was carried out by reduction in gradation(12) of clinical symptoms and reduction in blood and urine sugar levels (Fasting and post prandial) on the day of primary assessment and on 15th day . Shown in Table 7.

Table no. 7 : Assessment on the basis of subjective and objective criteria

Type of assessment	Before treatment	After treatment
A)Subjective criteria		
Excessive urination	1 (+)	0
Heaviness of body	4 (+)	1
Excessive sweating	2 (+)	0
Burning sensation in hands and feet	2 (+)	0
Weight gain	3 (+)	1
Distention of abdomen	4 (+)	1
Itching over inguinal region	3 (+)	0
B)Objective criteria		
1)Blood sugar level		
•Fasting	121 mg%	85 mg%
•Post prandial	197 mg%	130 mg%
2) Urine sugar	-Present	-Absent

Table no. 8 : Gradations for Subjective Criteria

Sr. No	Subjective Criteria	Grade-0	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5
1	Excessive urination	3-5 times per day, no rarely at night	6-8 times per day, 1-2 times per night	9-11 times per day, 3-4 times per night	>11 times per day, 4 times per night		
2	Heaviness of body	No Heaviness	Occasionally feeling of heaviness for sometimes in hand and feet.	feeling of heaviness for sometimes in hand and feet, not affecting daily activities	Daily feeling of heaviness over body, which leads to <i>Akarmanyata</i>	Most part of body for long duration	All body, for most part of the body.

Poonam V. Ashtankar et al., Role of Panchatikta Panchprasutik Niruha Vasti in Prediabetes - A case report

3	Excessive sweating	Sweating after heavy work and fast movement or in hot cold weather	Profuse sweating after moderate work and movement	Sweating after little work and movement	Profuse sweating after little work and movement	Sweating even at rest or cold weather	
4	Burning sensation in hands and feet	No <i>Daha</i>	<i>Kara Pada Tala/ Supti</i> incontinuous	<i>Kara Pada Tala/ Supti</i> continuous but not severe	<i>Kara Pada Tala/ Supti</i> continuous and severe.		
5	Distention of abdomen	No <i>Adhmana</i>	Occasionally feeling of <i>Adhmana</i>	Daily After intake of food up to 1 hour with mild distention of abdomen	distention of abdomen up to 1-3 hour after intake of food	Moderate distention of abdomen up to 6 hours after intake of food	Severe distention of abdomen up to more than 6 hrs after intake of food
6	Dryness of Skin	No line on scrubbing with nail	Faint line on scrubbing by nail	Lining and even words can be written by nail	Excessive <i>Rukshata</i> leading to <i>Kandu</i>	<i>Rukshata</i> leading to crack formation	

Table 9: Showing American Diabetic Association diagnostic criteria for normal glucose, Prediabetes, and diabetes II (13)

Diabetes test	Normal	Prediabetes	Diabetes
Hemoglobin A1c %	< 5.7	5.7-6.4	≥ 6.5
Fasting blood sugar, mg/dL	< 100	100-125	> 125
Post prandial blood sugar mg/dL	< 140	140-199	> 199

Discussion

Considering all factors involved in the pathogenesis of *Prameha Poorvaroopa*, the main treatment principle is to remove *Kleda* in this case and *Vasti Karma* was already told by *Acharya Charaka* as it corrects the vitiation of *Vata* to stabilize its normal functions and also counteracting the vitiated *Kapha*, *Kleda*, and *Meda* by using specific drugs. So specially prepared medicated enema was prescribed in this case followed by palliative therapy. After 15 days, patient got significant relief clinically as well as improvement were observed in blood and urine sugar level shown in Table 7. Given treatment protocol mainly comprises of *Kledaharana*, which helps the breakdown of pathogenesis of prediabetes in this patient.

Probable mode of action of all interventions are given below:

Shoshanna Chikitsa

Abhyanga (Local massage – From lumbar to both feet) with *Tila Taila* followed by *Nadi Sweda* (sudation) – Before administration of *Niruha Vasti*, local *Snehana* and *Swedana* given to the patient as a preprocedural protocol of *Vasti*. Local *Snehana* helps to pacify *Vata*, softness of the body, removes *Mala* and local *Swedan* relieves stiffness, toughness, coldness and improves local blood circulation due to dilation of the blood vessels(14). Generally *Tila Taila* (sesame oil) is considered as best among all *Tailas* in *Ayurveda*(15) because it is *Tridoshghna* (subside all three *Doshas*) in nature and it nourishes tissues, gives strength and

increases *Agni* (15). *Nadi Sweda* with the decoction of *Nirgundi Patra* is a kind of sudation in which medicated steam is applied to the patient's body. *Nirgundi Patra* has *Vatahara*, *Shoolhara* property(16). It relieves the pain and stiffness. But in this is case, both of these treatment are applied as a part of protocol & to increase blood circulation with enhancement of effect of *Niruha Vasti*.

Panchatikta Panchprasutik Niruha Vasti –

Panchatikta Vasti is specially prescribed for *Prameha* in *Charaka Samhita*(10) in *Kaphaja Prameha*, being an *Abhishyanda Pradhana* disease. *Prameha* is the perfect indication for the use of this type of *Kledahara & Shodhana Vasti*. It is also a disease with a large *Dushya Sangraha* involved in its *Samprapti* (pathogenesis) (17). All the contents of this *Vasti* are *Tikta Rasatmak*, *Katu Vipaki* and *Ushna Viryatmak* so *Deepan Pachan*, *Anulomak* and *Krumighna* in nature(18).

- **Patol** - It is *Dushta Kaphanashaka Dravya* and useful in *Agnimandya* and *Yakritvikar*. It dilates opening of minute channels associated with *Pakwashaya* and expels *dosha* in the form of loose motion hence it should be used in *Udar and Prameha Vikar* for excretion of *Kleda*(19).
- **Nimba** - Digest and absorb *Drava*, *Kapha* and *Kleda* present in various *Dhatus* by its *Tikta* and *Ruksha Gunas* and controls *Bahumutrata* (20).
- **Bhunimba** - *Bhunimba* is useful in *Yakrit Pleeha Vikar*, *Vibandha* and *Agnimandya*(21).

- **Rasna**- It is *Vatakaphagna* in nature so act in *Prameha* and *Udar Vikar*(22).
- **Saptaparna** - Useful in liver debility as liver stimulant due to *Tikta Rasa*. Since *Tikta Rasa*, it liquefies *Kapha* and eliminates it. Also acts as a *Krimighna*. It should be used in *Hridayroga* and vitiation of blood being *Hridaya* and alternative due to *Tikta* and *Kashaya Rasa* so, it is used in this case(23).
- **Sarshpa Kalka** - Used in the *Vasti* due to its *Kaphavataghna*, *Deepan* and *Krimighna* property. It is especially useful in reduce *Pleehavridhhi* hence it is best medicine for enlargement of spleen according to *Aacharya Kashyapa*. Also *hridayouttejak* and useful in *Mutraghata*, *Mutrasanga* and *Kushtha*(24)
- **Saindhava** (Rock salt) - It has properties such as *Vishyandi*, *Sukshma*, *Tikshna*, *Ushna*, and *Vatghna* encourages the evacuation of bladder and rectum Besides this, *Sandhava* kills the properties of *Picchila*, *Bahula* and *Kashaya* of *Madhu*, and it is closely related to form a homogeneous mixture. The use of rock salt is useful in the correction of electrolyte imbalance also (25).
- **Madhu** (Honey) – which has a prebiotic index of 6.89, due to its oligosaccharides(24). With this, honey helps grow a healthy microbial flora. Fructose and glucose, the main carbohydrate in honey, have same molecular formula, but different structural formula(26). Fructose helps to reduce the amount of hyperglycemia or obesity in these patients(27).
- **Go Ghrita** - Due to the lipid soluble nature, *Vasti Dravyas* mixed with ghee are readily absorbed into the rectum. As the rectum has a rich supply of blood and lymph (28).

Shaman Chikitsa

- **Chandraprabha Vati**– It cures the twenty varieties of *Prameha*. It relieves *Vata*, *Pitta* and *Kapha*. Due to an increase in the frequency of urination, abdomen distention and Itching purpose, *Chandrapra Vati* prescribed in this patient (29).
- **Arogyavardhini Vati** – – It provides total health and frees the body from all kinds of diseases because it balances the three *Dosha*. In this condition it is beneficial for the removal of excess fat, for the degradation of various types of toxins from the body and for the reduction of accumulated cholesterol in the body. It is also beneficial as a hepatoprotective, cardioprotective and digestive properties. (30).
- **Gandharva Haritaki churna** - *Gandharva Haritaki Churna* has *Vatahara* and *Ruksha Virechak* properties. In this patient it is indicated in the management of distention of abdomen as it is *Anulomak* in nature. It also potentiates the over all absorption of medicine(31).

Conclusion

The overall effect of above mention therapy reveals that prediabetes can be cured effectively with collaborative approached including *Panchatikta Panchaprasutik Niruha Vasti* and Palliative treatment

without causing any adverse effect. It can be alternative therapy in current era for prediabetes . Now it is a need of hour to conduct trial with similar intervention in large sample size because it is a single case study to establish specific guidelines for the management of prediabetes & to generate evidence based research for upcoming researchers in future.

References

1. Bansal N, Prediabetes diagnosis and treatment: A review. World J Diabetes 2015; 6(2): 296-303 Available from: URL: <http://www.wjnet.com/1948-9358/full/v6/i2/296.htm> DOI: <http://dx.doi.org/10.4239/wjd.v6.i2.296>.
2. Tripathi B, editor. Nidansthana; Pramehanidana Adhyaya. Vagbhata, Ashatanghrudaya. Chapter 10, Verse 7. Delhi, India: Chaukhamaba Sanskrit Pratishthan; 2015. p. 495.
3. Shukla V, Tripathi R, editor. Nidansthana; Prameha Nidana Adhyaya. Verse 3,8. In: Agnivesh ,Charak Samhita. Delhi, India: Chaukhamba Sanskrit Pratisthana; 2011. p. 501,503.
4. Sharma A, editor. Sutrasthana; Vranaprasnadhyaaya. Verse 33. In: Sushrut, Sushruta Samhita Varanasi, India Chaukhamba Surbhara ti Prakashana, 2015. p.90.
5. American Diabetes Association and National Institute of Diabetes, Digestive and Kidney Diseases. The prevention or delay of type 2 diabetes. Diabetes Care 2002; 25: P.742-749.
6. Shukla V, Tripathi R, editor. Chikitsasthana; Prameha chikitsa Adhyaya. Verse 51. In: Agnivesh , Charak Samhita. Delhi, India: Chaukhamba Sanskrit Pratisthana; 2011. p. 176.
7. Tripathi B, editor. Chikitsasthana; Pramehachikitsa Adhyaya. Vagbhata, Ashatanghrudaya. Chapter 13, Verse 2-3. Delhi, India: Chaukhamaba Sanskrit Pratishthan; 2015. p. 715.
8. Shukla V, Tripathi R, editor. Sidhistana; Prasruyogiya siddhi Adhyaya. Verse 8. In: Agnivesh ,Charak Samhita. Delhi, India: Chaukhamba Sanskrit Pratisthana; 2011. p.938.
9. Shukla V, Tripathi R, editor. Chikitsasthana; Prameha chikitsa Adhyaya. Verse 13-15. In: Agnivesh , Charak Samhita. Delhi, India: Chaukhamba Sanskrit Pratisthana; 2011. p. 170.
10. Shukla V, Tripathi R, editor. Chikitsasthana; Prameha chikitsa Adhyaya. Verse 4. In: Agnivesh , Charak Samhita. Delhi, India: Chaukhamba Sanskrit Pratisthana; 2011. p. 167.
11. Shukla V, Tripathi R, editor. Nidansthana; Prameha Nidana Adhyaya. Verse 5. In: Agnivesh , Charak Samhita. Delhi, India: Chaukhamba Sanskrit Pratisthana; 2011. p. 502.
12. Baghel MS. Textbook of Developing Guidelines for Clinical Research Methodology in Ayurveda. Institute for Postgraduate Teaching and Research in Ayurveda. Jamnagar, India: Published by Gujarat Ayurveda University; 2011. p. 65-68.

13. Tuso P, Prediabetes and Lifestyle Modification: Time to Prevent a Preventable Disease. The Permanente Journal/ Summer 2014/ Volume 18 No. 3.
14. Pande P, Deshpande P. Osteoarthritis (Sandhigata Vata) in geriatric and its management with Kala basti: Research Article. World Journal of Pharmaceutical and Life Sciences wjpls, 2017, Vol. 3, Issue 5, 146-149.
15. Joseph R, Cherian A. Role of (oil massage) to lead a healthy life. Ayurpharm Int J Ayur Alli Sci., Vol.1, No.7 (2012) Pages 163 – 167.
16. Patil R. Comparatrive study of Effect of Nirgundi Patra Piinda Sweada and Nadi Sweda in Katishool. Tilak Maharashtra Vidyapeeth, Pune .Desember-2016.
17. Dimble M, Joshi Y, Asutkar V. Study of role of Panchatikta Basti in Abhishyanda Pradhana Prameha . Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861. Volume 16, Issue 4 Ver. VI (April. 2017), PP 64-68.
18. Deshpande AP, Subhash R, editors. Textbook of Dravayguna Vigyan (English), Part-2, A.R. Nandurkar, Shaniwar Peth, India: Proficient Publishing House; 2007.
19. Deshpande AP, Subhash R, editors. Textbook of Dravayguna Vigyan (English), Part-2, A.R. Nandurkar, Shaniwar Peth, India: Proficient Publishing House; 2007. p. 419-421.
20. Deshpande AP, Subhash R, editors. Textbook of Dravayguna Vigyan (English), Part-2, A.R. Nandurkar, Shaniwar Peth, India: Proficient Publishing House; 2007. p.325-328.
21. Deshpande AP, Subhash R, editors. Textbook of Dravayguna Vigyan (English), Part-2, A.R. Nandurkar, Shaniwar Peth, India: Proficient Publishing House; 2007. p.846.
22. Deshpande AP, Subhash R, editors. Textbook of Dravayguna Vigyan (English), Part-2, A.R. Nandurkar, Shaniwar Peth, India: Proficient Publishing House; 2007. p. 949-950.
23. Deshpande AP, Subhash R, editors. Textbook of Dravayguna Vigyan (English), Part-2, A.R. Nandurkar, Shaniwar Peth, India: Proficient Publishing House; 2007. p. 479-481.
24. Deshpande AP, Subhash R, editors. Textbook of Dravayguna Vigyan (English), Part-2, A.R. Nandurkar, Shaniwar Peth, India: Proficient Publishing House; 2007. p.664-665.
25. Auti S, Jadhava N, Thakar A. Basti (medicated enema)- An alternative in prevention and management of diabetes. Ayurpharm Int J Ayur Alli Sci., Vol.2, No.11 (2013) Pages 350 – 356.
26. The chemistry of carbohydrates found in food. Retrieved from: <http://www.medbio.info> [Accessed on: 15/5/2020].
27. Vaisman N, Niv E, Izkhakov Y, Catalytic amounts of fructose may improve glucose tolerance in subjects with uncontrolled non-insulin-dependent diabetes. Clinical Nutrition 2006; 25: 617-21.
28. Chalapathi R, Lakshmi V, Goud R, Rasamrut V. Efficacy of Yogabasti Comprising of Panchatikta Niruha Basti & Madanaditaila Anuvasanabasti in the Management of Kitibha Kushta Vis-À-Vis Psoriasis. Ayurveda e-Journal Rasamruta, 4:4, June 2012.
29. Mishra S, editor. Mandagani Chikitsa Prakarana. Verse 102-110. In: Govind D. Bhaisajyaratnavali. Varanasi, India: Chaukhamba Surbharati Prakashan; 2007. p. 521-522.
30. Pal S, Ramamurthy A, Mahajon B. Arogyavardhini Vati: A theoretical analysis Journal of Scientific and Innovative Research 2016; 5(6): 225-227.
31. Tripathi B, editor. Sutrasthana; Doshopakramaniya Adhyaya.Vagbhata, Ashatang Hrudaya. Chapter 13, Verse 1–3. Delhi, India: Chaukhamba Sanskrit Pratishthan; 2015. p. 185.
