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Assessing *Taila Bindu Pariksha* as a Diagnostic and Prognostic Test for Diabetes Mellitus

Saumya Dwivedi[1,*], Avadhesh Kumar[2]

Abstract

Introduction: *Ayurveda has consistently emphasized on not only just treatment of a disease but also on how to diagnose it and further assess the prognosis. Ayurveda is blessed with different diagnostic tests which are broadly classified into Roga and Rogi Pariksha such as Ashtavidha Pariksha, Dashavidha Pariksha and Dwadashavidha Pariksha. These tests are used very rarely by just few Ayurvedic practioners as important diagnostic and prognostic methods in different diseases. Taila Bindu Pariksha is among the important parikshan included under the Ashtasthana pariksha for Mutravaha Srotas janya vikara in Ayurveda.* ***Objective:*** *Diabetes mellitus has emerged as one of the most prevalent diseases of the decade and more people are getting it earlier in their thirties, prompting a targeted disease for this research work. People are usually getting tested for Diabetes when they get some symptoms of it like increased frequency of micturition, polyphagia, change in their weight, etc. However, Ayurveda can definitely play a significant role in early diagnosis as well as in the prognosis of the disease as its core lies in preventing the disease. Assessing the disease in its early phase, like prakopavastha, prasaravastha, and sthansamshraya (Poorvaroopa), leads to early diagnosis as well as good prognosis and preventing the asadhya avastha. In this study, prognosis will be assessed depending on the pattern, shape, and direction of spreading of oil drop over a stable surface of urine sample. Assessment of results was carried out by keeping all the parameters fixed like procedure of collection of urine samples, distance at which Sesame oil is dropped and to give proper time for spread of oil drop, etc.* ***Methods and Material:*** *Total of 60 randomly selected cases were divided into two equal groups, each group consisted of 30 patients. Group 1 with uncontrolled and group 2 with controlled cases of Diabetes mellitus patients. Photographic recording will be done, and the results were drawn by analyzing oil drop spreading pattern, its direction, shape of oildrop over urine surface and sinking pattern. Also, urine routine and microscopy for specific gravity for each sample were done.* ***Results:*** *Uncontrolled diabetic patients had higher specific gravity values, irregular shapes in comparison to the controlled one.* ***Conclusions:*** *With the change in the intensity of the blood sugar in different patients' sample, the shape, size and direction of dispersion of drop of sesame oil was changed.*

***Author for Correspondence**
Saumya Dwivedi
E-mail: saumya16193@gmail.com

[1]Research Scholar, Department of Roga Nidana Evam Vikriti Vigyan, Govt. Ayurveda P.G. College & Hospital, Varanasi, Uttar Pradesh, India
[2]Professor & HOD, Department of Roga Nidana Evam Vikriti Vigyan, Govt. Ayurveda P.G. College & Hospital, Varanasi, Uttar Pradesh, India

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INTRODUCTION

In India, nearly 101 million adults have Type 2 diabetes and nearly 136 million are under prediabetic condition (According to WHO). Over half remain undiagnosed, leading to complications, and diabetics have a 2–3 times higher risk of heart attacks and strokes [1].

Ayurveda classifies diseases based on the *Doshas* involved. *Prameha (Diabetes)* has been

considered as the *mutravaha srotas vyadhi*. It has been classified basis on the doshas into 3:

- *Vataj Prameha.*
- *Pittaja Prameha.*
- *Kaphaj Prameha* [2].

Also, each of the types is further classified based on urine consistency, color, smell and taste. Any disease needs to be properly diagnosed prior to the application of any treatment [3]. Proper diagnosis of the disease is examined under the broad heading of *Ashtavidha Pariksha* (eight types of tests for examining the diseases in a patient) as described by *Acharya Yogaratnakar*. It includes examination of *Nadi* (Pulse), *Mutra* (Urine), *Mala* (*Pureesha*/faeces), *Jihwa* (Tounge), *Shabda* (Speech), *Sparsha* (Touch), *Druka* (Eyes) and *Akruti* (Posture) [4].

Among these examinations, *Mutra Taila Bindu Pariksha* (MTBP) is one of the effective tools for the diagnosis as well as regarding prognostic angle as per *Ayurvedic* point of view. More validation of this test depends on pattern of oil drop spreading, shape, sinking and direction over surface of patient's urine [5]. On that basis curability and incurability of disease may be assessed. In Diabetes patients, fasting, post-prandial, RBS (Random Blood Sugar) and HbA1c are the usual tests for making the diagnosis and prognosis. *Mutra pariksha* is the diagnostic test described for *Prameha roga* as the *Mutravaha srotas* (especially the *basti*) is the part where the main pathogenesis of the disease occurs. It can also be used individuals that are at risk to Diabetes, either genetically or through lifestyle changes [6].

AIM AND OBJECTIVE

To evaluate *Taila Bindu Pariksha* in Diabetes patients and compare the results.

Inclusion Criteria

- Patients within the age group of 20 to 60 years.
- Irrespective of Gender and Religion.
- Patients with controlled and uncontrolled Diabetes mellitus cases along with the signs and symptoms of Diabetes [7].

Exclusion Criteria

- Patients with serious disorders like hypertension, chronic kidney disease, cardiac disorders, etc.
- Patients with Prostrate disorders or any kind of carcinoma [8].

MATERIALS AND METHODS

Materials

Under this study two groups were made. One group of 30 diabetic patients with uncontrolled sugar and 30 with controlled sugar. The morning samples of urine collected from the patients were subjected to *Taila Bindu Pariksha.* Additionally, urine routine and microscopy were done to assess each sample for the specific gravity and glucosuria in the sample through strip test. Also, other parameters will be checked to exclude other findings like proteinuria, urinary tract infections, etc.

The Requirements for Taila Bindu Pariksha Are

- *Testing Container:* A round glass petri dish measuring 2 inches in diameter and 1 cm in height.
- *Taila (Oil):* White Tila Taila (sesame oil) was preferably selected.
- *Container for Collection of Urine Sample:* A wide mouth, transparent, airtight, disposable plastic container was used.
- *Background:* A Background grid paper with directions marked on it was used to placed it below the petri dish.
- *Time Recorder:* Through mobile stopwatch.

- *Magnetic Compass:* It was employed to observe the direction of spread of oil.
- *Recorder:* Video clips will be recorded through the mobile
- *Collection of Urine Sample:* First morning urine sample (midstream) was collected as it consists of the maximum concentration of solutes.
- *Labelling of Samples:* The sample was labelled with the abbreviation of the name, along with the registration number provided by the Laboratory.
- *Place:* Special precautions were carried out to avoid the sample to be affected by wind, dust, or any other disturbing elements along with maintaining the proper exposure to observe the sample with natural sunlight.
- *Washing of Testing Container:* For every new test to be performed, a new petri dish was used to avoid any kind of infection in the sample, washed with tap water first and then rinsed with distilled water then left for drying in the oven.
- A chart paper was labelled with the directions for precisely estimating the direction of spread of oil drop as well as to make a central point for the petri dish container.

Methods

Patients were advised to sleep by 10 PM. On the next morning (5 or 6 AM) the first mid-stream urine was collected in the sterile container of 40 ml. A clean petri dish was filled with urine and once the urine surface becomes still and free from any external disturbances test was performed within 2 hours of collection to get the accuracy of the result as the surface tension of urine is static during this period. Single drop of sesame oil was slowly dropped over the stable surface of urine from a distance of 2 cm. It was left for two minutes for proper spread or interaction. The oil drop dispersal pattern on the surface of collected urine sample was recorded photographically. It was observed for 2 minutes with the help of stopwatch and result were concluded.

Precautions

- Only mid-stream of the morning first urine was preferred.
- Petri dish in which the urine was kept should be placed over the center of the base of background and it should be clean.
- Oil was slowly dropped only when the urine becomes stable without any external disturbances.
- Oil drop was dropped from a low height (2 cm height from the lower end point of the oil drop) without touching the urine with the drop end, some interaction between oil and urine should be allowed. Much height can disturb the urine surface and give false or inaccurate results. The results of oil spreading nature, direction and results urine surface [9, 10].

In Figure 1, the first image from left and above depicts the *sadhyata* as it spreads evenly and does not sink while the image from right and above shows no spreading pattern or to a very little extent and does not sink which depicts the *krichra sadhya* case. Both the images from the bottom have spread with disrupted shape leading to an *asadhya awastha* that might be due to some genetical outcome. Similarly, all the above images in Figure 2 also depict the *krichra sadhya* and *asadhya awastha*.

RESULTS

Total 60 cases, half each from controlled or uncontrolled Diabetes mellitus were included in the study. Distribution of patients, doshas involved, severity of disease based on the shape, specific gravity and direction of tail bindu on urine are mentioned below (Tables 1 to 4).

Table 1. Age-wise distribution of cases.

Age (yr)	Group1 (male)	Group 1 (female)	Group2 (male)	Group 2 (female)
40–50	3	4	5	5
50–60	7	5	7	4
60–70	7	5	4	5

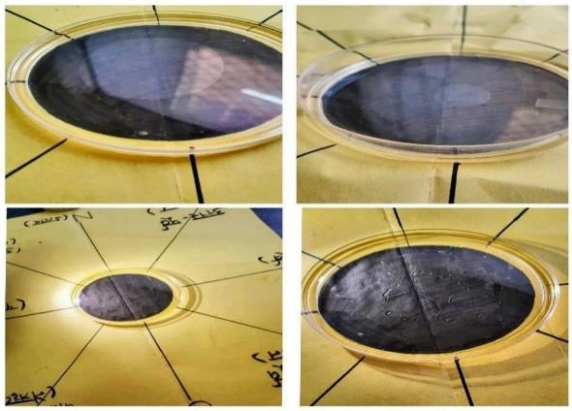

Figure 1. *Sadhyata.*

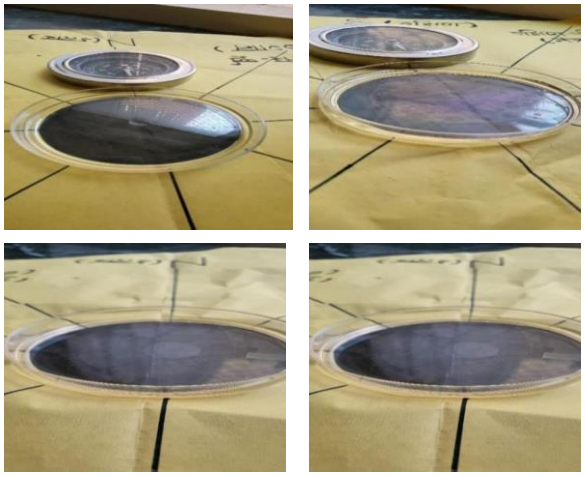

Figure 2. *Krichra sadhya* and *Asadhya awastha*.

Table 2. Distribution of shape of oil drop in the two groups.

Shape of oil drop	Group 1	Group 2	Total
Round	17	12	29
Oval	9	10	19
Irregular	4	5	09
Sieve like	7	6	13

Table 3. Based on specific gravity.

Specific gravity	Group 1	Specific gravity	Group 2
1.005	0	1.005	4
1.010	10	1.010	3
1.015	20	1.015	12
1.020	0	1.020	5
1.025	0	1.025	3
1.030	0	1.030	3

Table 4. *Sadhya asadhyata* is based on sinking pattern.

Spreading nature of oil	*Sadhya-asadhyata*.
Oil drop spreads immediately	*Sadhya*.
Does not spread immediately	*Krichra sadhya*.
Sinks in urine	*Asadhya*.

OBSERVATION

According to the Study, there was no such significant result observed in age and gender wise distribution. However, middle aged people (50–60 years) were more affected. Round drops were more frequent in controlled groups, while Oval and Irregular shape of drops were slightly higher in uncontrolled ones.

Higher specific gravity is found in uncontrolled diabetics with wider variation, including lower (1.005) to higher (1.030) values. Low values in uncontrolled cases might indicate Diabetes mellitus with Diabetes insipidus. There were more cases of irregular shapes of oil drops in uncontrolled cases with Oval, sieve, like patterns, though there are modern diagnostic methods for estimation of blood sugar, *Tailbindu pariksha* can be added on to the treatment profile regarding the prognosis as well as lifestyle management by differentiating the disease based on the doshas involved and also the severity of the disease. Now a days people are getting so much aware of their health and are eager to change the lifestyle based on the diagnostic results only, tail bindu will add more effective way to get a healthier life just by simple but effective *Ayurvedic* way of urine examination.

CONCLUSION

Though *Tail Bindu Pariksha* is an ancient method of diagnosis for *Mutravaha srotas,* can still be reliable for the diagnosis and prognosis of various diseases. Surely more pieces of research should be conducted for different *srotas* pathologies but it is authenticity for *Mutravaha sroto dushti* is something we cannot ignore. In this study, whether controlled or uncontrolled *diabetes mellitus*, the direction, shape and sinking pattern indicates the *sadhyata* and *asadhyata* of different cases according to the knowledge available in the texts. Through this the consultants can suggest the right *Ahar Vihar* which will prevent or better the situation.

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