

STANDARDIZATION OF TAILA BINDU PAREEKSHA

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ABSTRACT

Background: *Taila bindu pareeksha* is a special technique of urine examination explained in *Ayurveda* classics. In classics, procedure of *Taila bindu pareeksha* is explained, but primary standardization has to be achieved as there are many variables like shape and size of vessel, material of vessel, volume of urine to be taken in vessel, size of oil drop, height from which oil is to be dropped on the surface of urine, variety of *Tila taila* (sesamum oil) to be selected. **Objective:** Primary standardization of *Taila bindu pareeksha*. **Methodology:** Total 64 healthy volunteers from SDM college of Ayurveda hostel; Hassan was selected for primary standardization of *Taila bindu pareeksha*. It comprised of 32 males and 32 females, based on concise format according to World health organization, international classification of function and disability. An attempt is made to achieve primary standardization by changing one variable at a time and keeping all other variable constant. Apart from above variables other general factors which can intervene were also kept constant. **Result:** Glass vessel is better compared to bronze and circular shaped glass vessel is better than square shaped vessel. 12.2 inches circumference with 30 ml volume of urine test sample is found to be better compared to 11.5 inches and 20ml of urine taken in circular and square shaped glass vessel. *Taila bindu* of *Tila taila* extracted from *Krishna* variety of *Tila* measuring 12 μ l dropped by 50 μ l micropipette from the height of 1 centimetre was found to be better based on various characters exhibited by oil drop while spreading on urine. **Conclusion:** *Taila bindu pareeksha* standardized procedure is 30 ml urine sample taken in circular shaped glass vessel of circumference 12.2 inches. *Taila* extracted from *Krishna Tila*, with drop size being 12 μ l pipetted from 50 μ l micropipette dropped from a height of 1cm from the surface of urine and various characters exhibited by oil drop while spreading on urine be noted and analysed.

Keywords: *Taila bindu pareeksha*, circumference, *Krishna*.

INTRODUCTION

Taila bindu pareeksha was developed by medieval *Ayurveda* scholars mainly to predict diagnosis and prognosis of a disease, based on movement of *Taila bindu* in different direction and different shapes exhibited by *Taila bindu* on spreading over urine.¹ In *Ayurveda* classics procedure of *Taila bindu pareeksha* is explained, but primary standardization has to be achieved as there are many variables

like shape and size of *Patra* (vessel), volume of urine taken in *Patra*, size of oil drop, dropping height from the surface of urine, variety of sesamum oil selected and time of *Pareeksha*. Therefore, standardization of *Taila bindu pareeksha* is planned in present study. An effort is made to achieve standardization by conducting *Taila bindu pareeksha* on 64 healthy volunteers diagnosed based on World health organisation,

International classification of health and disability questionnaire² and routine urine examination.

MATERIALS AND METHODS:

Source of data: Total 64 healthy volunteers from SDM Ayurveda college hostel, Hassan were selected for primary standardization of *Tailabindu pareeksha*.

Method of Taila Binda Pariksha: Total 64 healthy volunteers comprising 32 males and 32 females were included based on concise format according to World health organization, international classification of function and disability. An attempt is made to achieve primary standardization by changing one variable at a time and keeping all other variable constant. Apart from above variables other general factors which can intervene were also kept constant.

The screening of the healthy volunteers was followed by collection of mid-stream urine sample at 4 am in the morning. Later, Urine examination was done by dipstick method (SD-Urocolour-10) to evaluate various parameters of urine and rule out any pathology in the urine sample.

The collected sample was then subjected to *Taila bindu pariksha* under sun light between mornings 6:30am to 7:30am. For analysing the direction of spread, a black chart marked with white lines by determining various directions with the help of mariners compass. Different direction

as east, west, north, south, north east (*Eshanya*), south east (*Agneya*), North West (*Vayaviya*), south west (*Nairutya*) was prepared and placed underneath the transparent container in which urine was to be taken. Both square and round shaped glass vessels were selected for study. Each vessel with dimension 11.5inches and 12.2 inches circumference were taken. In Each glass vessel with different shape and dimension mentioned above, Urine sample with volume 20ml and 30ml was taken separately. A drop of *Tila taila* measuring 12µl was dropped individually over the surface of urine sample (20&30ml) collected on both the vessel (Round and Square) from a height of 1cm & 5cm from the surface of the urine sample. Stopwatch was utilized for measuring the span of time taken for spreading of *Taila bindu* over urine sample from the time of fall of drop till it spreads out. Observation of various shapes that was formed after spread of *Taila bindu* on surface of urine sample was closely observed and recorded. The whole procedure was video recorded.

OBSERVATION AND RESULTS

Standardization of Tila taila: Two variety of *Tila taila* (*Taila* derived from black variety and white variety of *Tila*) was taken for the study. These were separately dropped on urine samples keeping all other variable constant and spread time was noted.

Table 1 Showing spread time for two varieties of Tila taila on surface of urine

Variety of <i>Tila taila</i>	<i>Taila</i> from <i>Krishna tila</i>		<i>Taila</i> from <i>Shweta tila</i>	
	N	Percentage	N	Percentage
Spread time				
Absent (<i>Bindu</i>)	4	12.5	4	12.5
Up to 5 seconds	12	37.5	20	62.5
Between 6 to 10 seconds	16	50	8	25
Total	32	100	32	100

N= Number of healthy volunteers
Study was carried out using both the varieties of *Tila taila* (oil extracted

from *Krishna* and *Shweta tila* seeds), *Krishna tila taila* when utilized for the study showed significance because of in-

creased spread time whereas *Shwetha tila taila* when utilized for the study showed comparatively shorter spread time. Hence *Tila taila* obtained from *Krishna tila* was accepted as standard.

Standardization of Size of oil drop

According to *Ayurveda* literature, *Truna* is mentioned for dropping oil over

Dropping material	Weight of <i>Krishna tila taila</i>	Weight of <i>Shweta tila taila</i>
<i>Truna 1</i>	0.11mg	0.12mg
<i>Truna 2</i>	0.12mg	0.11mg
<i>Truna 3</i>	0.12mg	0.12mg
<i>Truna 4</i>	0.12mg	0.12mg
<i>Truna 5</i>	0.12mg	0.12mg
<i>Truna 6</i>	0.11mg	0.12mg

Mean = 0.12mg

Size of oil drop was standardized with help of micropipette. 50µl micropipette was used to standardize the quantity of the oil drop. *Tila taila* extracted from *Krishna tila* and *Shweta tila* was pipetted separately by a micropipette, commencing from 1µl to 11µl and weight of oil drop at each instance was measured over weighing balance. On dropping 12µl of oil the weighing machine showed a reading of 0.012mg as follows and the weight is equivalent to the mean weight of *Tila taila* dropped from *Truna* at 6 different times.

Taila bindu (extracted from *Krishna tila*) of size 12µl dropped by 50µl micropipette was accepted as standard.

Material of Patra

Patra is vessel in which urine sample is to be taken for *Taila bindu pareeksha*. *Patra* of glass material and bronze material were compared. Glass vessel is cheap, light weight, easy in handling, cleaning and various shape formed by

surface of urine sample. *Tila taila* from *Krishna tila* and *Tila taila* from *Shweta tila* each were separately dropped by *Truna* and weight of each drop was recorded at 6 different times as follows.

Table 2: Showing weight of *Tila taila* (From *Krishna* and *Shweta tila*) drop, dropped by *Truna*

spreading oil drop on urine sample can be easily observed and recorded, Further, surface active molecules that can affect the spread of oil film can be easily removed from the glass vessel, and glass can be washed with any materials like strong acid or alkali. Bronze vessel is costly, heavy, difficult to handle and clean, various shape formed by spreading oil drop on urine sample cannot be easily observed and recorded.

Glass material and bronze material *Patra* was compared and based on merits glass material *Patra* was accepted as standard.

Shape and size of *patra*: The test was performed in square and circular shape glass *Patra* each of the size 11.5 inches and 12.2 inches circumference and observation on spread time and shape attained after spread are noted below.

Table 3: Showing spread time of oil drop in circular shape glass *Patra*

Shape of <i>Patra</i>	Circular shape glass <i>Patra</i> (n=32)			
	11.5 inches(n=16)		12.2 inches(n=16)	
Size of <i>Patra</i>	Frequency	Percentage	Frequency	Percentage
Spread time				
Absent (<i>Bindu</i>)	4	25	3	18.75
Up to 5 seconds	9	56.25	6	37.5

Between 6 to 10 seconds	3	18.75	7	43.75
Total	16	100	16	100

Table 4: Showing shape attained after spread of oil drop on urine in circular shaped glass Patra of 11.5 inches and 12.2 inches circumference

Shape of Patra	Circular shape Patra (32 in number)			
Shape of spread	11.5 inches(n=16)		12.2 inches(n=16)	
Bindu	4	25	3	18.75
Circular shape	4	25	8	50
Un defined/Irregular	8	50	5	31.25
Total	16	100	16	100

Table 5: Showing spread time of oil drop on urine in square shaped glass Patra of 11.5 inches and 12.2 inches circumference

Shape of Patra	Square shaped Patra (32 in number)			
Size of Patra	11.5 inches(n=16)		12.2 inches(n=16)	
Spread time	Frequency	Percentage	Frequency	Percentage
Absent	2	12.5	0	0
Up to 5 seconds	9	56.25	7	43.75
Between 6 to 10 seconds	5	31.25	9	56.25
Total	16	100	16	100

Table 6: Showing shape attained after spread of oil drop on urine in square shaped glass Patra of 11.5 inches and 12.2 inches circumference

Shape of Patra	Square shape Patra (32 in number)			
Shape of spread	11.5 inches(n=16)		12.2 inches(n=16)	
Bindu	2	12.5	0	0
Circular shape	4	25	5	31.25
Un defined/Irregular	10	62.5	11	68.75
Total	16	100	16	100

Circular shaped glass vessel was accepted as standard, as it is easy to observe the spread of *Taila bindu* dropped at center on urine. The equal distance from the center to periphery helps in precise observation of spread time and shape attained after spread. Square and Circular shaped glass *Patras* of size 11.5 and 12.2 inches circumference was compared for spread time and shape formed by *Taila bindu* after spread on surface of urine. It was ob-

served that spread time is more in 12.2 inches circumference vessel. Hence the *Taila bindu* spreads slowly on surface of urine and shape formed on surface of urine by spreading *Taila bindu* can be better appreciated and recorded. Therefore circular shaped glass *Patra* of 12.2inches was accepted as standard.

Volume of urine: Circular glass *Patra* of 11.5 inches and 12.2 inches circumference was selected and in each of it 30ml and

20ml urine was taken alternately and observation were noted. Same is repeated with square shape *Patra*.

Circular shaped glass vessel: 20ml of urine sample was taken; It filled and touched the sides of container (Circular vessel) of 11.5 inches, but in 12.2 inches circumference container did not touch the sides.

Square shaped glass vessel: 20ml of urine sample got filled with sufficient depth in square shaped glass vessel of 11.5 inches circumference and with shallow depth in 12.2 inch circumference vessel.

Circular shaped and square shaped glass vessel: 30ml of urine sample occupied the square and circular shaped vessel of both 11.5 and 12.2 inches of circumfer-

ence respectively with sufficient dept. It was observed that *Taila bindu* dropped on surface of urine doesn't touch the circumference or edge of the circular vessel and square vessel after spreading. As circular shaped glass *Patra* is readily available glass vessel with circular shape and circumference 12.2 inches and volume 30ml was accepted as standard.

Dropping Height of the oil drop from the surface of urine: *Taila bindu* of size 12µl was dropped from a height of 5cm and 1cm from the surface of urine separately by micropipette and generation of ripples were observed.

Table 7: Showing formation of ripples by dropping *Taila bindu* from a height of 5 cm and 1 cm

Dropping height of <i>Taila bindu</i> from surface of urine-5 cm			Dropping height of <i>Taila bindu</i> from surface of urine-1cm	
Number of ripples	Frequency	Percentage	Frequency	Percentage
0 Ripple	0	0	14	43.75
1 Ripple	6	18.75	15	46.875
2 Ripples	17	53.125	3	9.375
3 Ripples	7	21.875	0	0
4 Ripples	2	6.25	0	0
TOTAL	32	100.0	32	100.0

On dropping *Taila bindu* from height of 1cm from the surface of urine sample minimum number of ripples were formed in comparison to *Taila bindu* dropped from a height 5cm. Hence *Taila bindu* dropping height was standardized as 1cm.

DISCUSSION

Procedure of *Taila bindu pareeksha* is explained in *Ayurveda* classics^{5,6,7,8}, but primary standardization of procedure is need of the hour as there are many variables like shape and size of *Patra* (vessel), material of *Patra*, volume of urine to be taken in *Patra*, size of oil drop, height from which oil is to be dropped on the sur-

face of urine, variety of *Tila taila* (sesamum oil) to be selected. Hence, in this preliminary study an attempt is made to achieve primary standardization by changing one variable at a time and keeping all other variable constant. Apart from above variables other general factors which can intervene were also kept constant in the present study. Collection of urine was done from volunteers who were healthy, assessed according to International classification of function and disability check list according to WHO. In order to rule out change in constituents of urine, same diet menu was provided to all healthy volunteers. Collection of mid-

stream urine was done in sterile glass vessel between 4am to 4.30am. Further urine analysis was done by multistix urine examination strip to rule out any abnormality in urine and collected sample was then subjected to *Taila bindu pareeksha* in natural light between 6:30am to 7:30am. For analysing the direction of spread, a black chart marked with white lines by determining various direction with the help of mariners compass was used. Different direction as east, west, north, south, north east (*Eshanya*), south east (*Agneya*), North West (*Vayaviya*), south west (*Nairutya*) was marked and placed underneath the transparent container in which urine was to be taken. Stopwatch was utilized for measuring the span of time taken for spreading of *Taila bindu* over the collected urine sample from the time of fall of oil drop on surface of urine till it spreads completely. Later the shapes formed by spreading *Taila* over surface of urine sample was observed and interpreted. Whole procedure of *Taila bindu pareeksha* was done in a closed room for avoiding exposure to wind that may interfere with the spread of oil drop and development of shape on the surface of urine. Procedure was done in a closed room with constant temperature in natural sunlight. All the containers, vessels and equipment's used for procedure were clean and sterilized.

In Ayurvedic texts, there is no reference about, which variety (black or white) of *Tila taila* has to be taken for *Taila bindu pareeksha*. In the present study, various properties of both varieties of *Tila taila* (Extracted from *Krishna* and *Shweta tila*) was compared and an attempt was made to check the behaviour of two varieties of *Tila taila* on urine. With this aim, white and black variety of *Tila* was purchased from Hassan and oil was extracted. Study was carried out using both the varieties of

Tila taila (oil extracted from *Krishna* and *Shweta tila* seeds), *Krishna tila taila* when utilized for the study showed significance because of delayed spread time in comparison to *Shweta tila taila*. When spread time is delayed, it is easy to observe and record various observations. Hence, *Tila taila* extracted from black variety of *Tila* was accepted as standard.

Next variable considered was size of oil drop. According to *Ayurveda* literature, *Truna* is mentioned for dropping oil over surface of urine sample^{9,10,11}. In the present study *Tila taila* from *Krishna tila* and *Tila taila* from *Shweta tila* each were separately dropped by *Truna* and weight of each drop was recorded at 6 different times with a mean 0.12mg. Size of oil drop was standardized with help of micropipette. 50µl micropipette was used to standardize the quantity of the oil drop. *Tila taila* extracted from *Krishna tila* and *Shweta tila* was pipetted separately by a micropipette, commencing from 1µl to 11µl and weight of oil drop at each instance was measured over weighing balance. On dropping 12µl of oil the weighing machine showed a reading of 0.12mg and the weight is equivalent to the mean weight of *Tila taila* dropped from *Truna* at 6 different times. Thus 12µl *Tila taila* (extracted from *Krishna tila*) dropped from 50µl micropipette was accepted as standard.

Material of *Patra* (Container or vessel in which urine is to be taken) was the next variable considered. According to classics glass and bronze *Patra* is recommended. As bronze is costly, difficult to wash and dry, heavy and opaque due to which movement of oil drop and various shape formed during spread of *Taila bindu* on urine cannot be easily observed and recorded. Glass vessel is cheap, light weight, easy in handling, and different shape formed can be easily observed and

recorded, Further, surface active molecules that can affect the spread of oil film can be easily removed from the glass vessel and glass can be washed with any materials like strong acid or alkali. Hence considering these merits, glass vessel was preferred over bronze vessel and glass vessel was accepted as standard.

Shape of the vessel was the next variable that requires standardization. The circular shaped glass vessel was accepted as standard, as it is easy to, observe and record the spread of *Tila taila* and different shape formed on urine in the *Patra*. The periphery being equi-distant from the centre helps in precise observation and recording. Further, availability of square shape *Patra* of specific dimension is not common, whereas circular glass vessel of different dimension is easily available. Hence circular glass vessel was accepted as standard.

Size of the *Patra* was the next variable taken up for standardization. Circular and square shaped glass *Patra* each of 11.5 inches and 12.2 inches circumference respectively was taken.

The shape developed by oil drop after spread over urine was almost alike in both circular and square shaped *Patras*. However, it was better appreciated in circular shaped glass vessel of 12.2 inches. On comparison, spread time was less in 11.5 inches *Patra*. Hence 12.2 inches circumference circular glass *Patra* was accepted as standard, as slower the spread better is the observation.

Next variable taken for standardization was volume of urine in the vessel. Each 20ml and 30ml urine was taken in square and circular shaped vessel separately. In circular vessel 20ml of urine sample was taken; it filled and touched the sides of container of 11.5 inches circumference, but did not touch the sides in the circular

vessel with 12.2 inches circumference. This shows that urine volume is inadequate. 20ml of urine sample got filled with sufficient depth in square glass vessel of 11.5 inches circumference and with shallow depth in 12.2 inch circumference vessel. 30ml of urine sample occupied the square and circular vessel of both 11.5 inches and 12.2 inches of circumference respectively with sufficient depth. Hence there is an opportunity for the oil drop to sink. Therefore, 30ml volume of urine in circular shaped 12.2 inches circumference glass vessel is accepted as standard.

Dropping height of the oil drop from the surface of urine was the last variable considered for standardization. *Tila taila* was dropped at 2 different heights, i.e. 1cm and 5cm from the surface of urine sample. *Tila taila* dropped from height of 1cm from the surface of urine sample generated minimum ripples in comparison to *Tila taila* dropped from a height 5cm. When the number of ripples are more it indicates the disturbance on surface of urine is more. In such an environment spread of *Taila bindu*, spread time direction of spread and shape formed are difficult to assess. Hence, standard height of dropping *tila taila* from surface of urine was accepted as a height of 1cm. Thus, lesser the number of ripples better the spread and formation of shape, as disturbance due to ripples is less. Therefore, helps in better interpretation of pattern of formation of shape and spread of the *Taila* over urine surface minimising error in reading and interpretation.

CONCLUSION





From the present study it is concluded that following is standardised method of *Taila bindu pareeksha*, 30 ml urine sample to be taken in circular shaped glass vessel of circumference 12.2 inches. *Taila* extracted from *Krishna tila*, with drop size being 12 μ l pipetted from 50 μ l micropipette

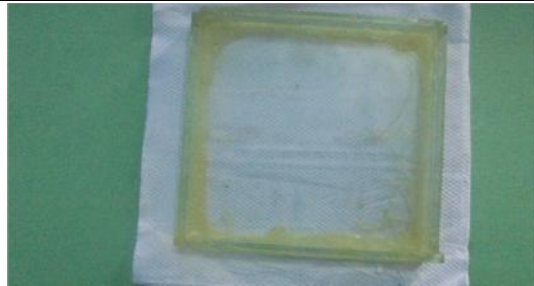
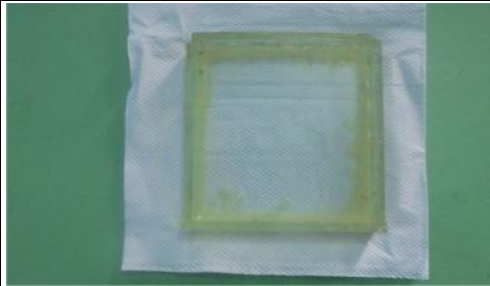
dropped from a height of 1cm from the surface of urine and various characters exhibited by oil drop while spreading on urine be noted and analysed.

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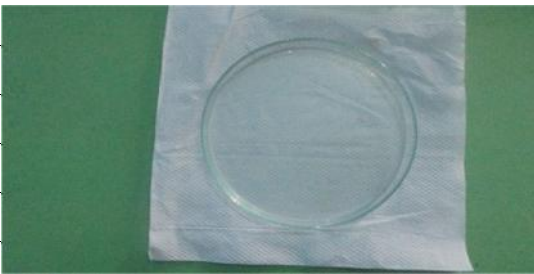
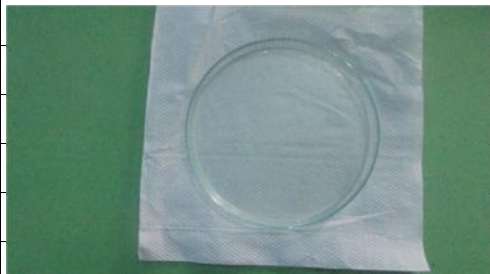
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Shweta tila	Krishna tila
	
Shweta tila paste	Krishna tila paste



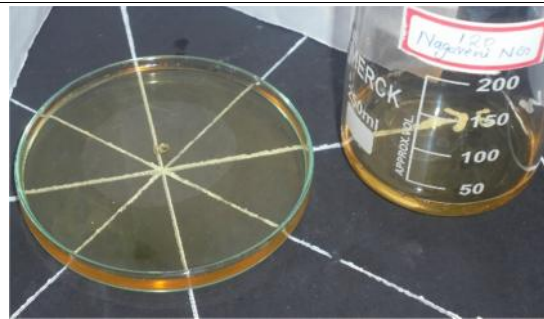
11.5 inches square shape patra`

12.2 inches square shape patra



11.5 inches round shape patra`

12.2 inches round shape patra



Materials used for Taila bindu pareeksha

Spread of Taila on surface of urine

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