STANDARDIZATION OF TAILA BINDU PAREEKSHA

Mohamed Nazir K K¹, Ajantha²
¹Post Graduate Scholar, ²Associate professor,
Department of Roga Nidana, Sri Dharmasthala Manjunatheshwara College of Ayurveda and
Hospital, BM Road, Thanmiruhalla, Hassan, Karnataka, India

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 Tailabindu 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 12µl dropped by 50µl 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 being12µl pipetted from 50µl 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 pareeksa 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 questionnaire\(^2\) 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 sunlight 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>
<thead>
<tr>
<th>Variety of <em>Tila taila</em></th>
<th>Taila from Krishna <em>tila</em></th>
<th>Taila from Shweta <em>tila</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spread time</strong></td>
<td><strong>N</strong></td>
<td><strong>Percentage</strong></td>
</tr>
<tr>
<td>Absent (Bindu)</td>
<td>4</td>
<td>12.5</td>
</tr>
<tr>
<td>Up to 5 seconds</td>
<td>12</td>
<td>37.5</td>
</tr>
<tr>
<td>Between 6 to 10 seconds</td>
<td>16</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>

\(N=\) 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 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**

<table>
<thead>
<tr>
<th>Dropping material</th>
<th>Weight of Krishna tila taila</th>
<th>Weight of Shweta tila taila</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truna 1</td>
<td>0.11mg</td>
<td>0.12mg</td>
</tr>
<tr>
<td>Truna 2</td>
<td>0.12mg</td>
<td>0.11mg</td>
</tr>
<tr>
<td>Truna 3</td>
<td>0.12mg</td>
<td>0.12mg</td>
</tr>
<tr>
<td>Truna 4</td>
<td>0.12mg</td>
<td>0.12mg</td>
</tr>
<tr>
<td>Truna 5</td>
<td>0.12mg</td>
<td>0.12mg</td>
</tr>
<tr>
<td>Truna 6</td>
<td>0.11mg</td>
<td>0.12mg</td>
</tr>
</tbody>
</table>

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.

Tila 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 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**

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

<table>
<thead>
<tr>
<th>Dropping height of Taila bindu from surface of urine-5 cm</th>
<th>Dropping height of Taila bindu from surface of urine-1cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of ripples</td>
<td>Frequency</td>
</tr>
<tr>
<td>0 Ripple</td>
<td>0</td>
</tr>
<tr>
<td>1 Ripple</td>
<td>6</td>
</tr>
<tr>
<td>2 Ripples</td>
<td>17</td>
</tr>
<tr>
<td>3 Ripples</td>
<td>7</td>
</tr>
<tr>
<td>4 Ripples</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>32</td>
</tr>
</tbody>
</table>

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 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 surface 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 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. 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 from50µl 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 Patra. 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 12µl pipetted from 50µl 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.

REFERENCES

2. ICF check list, Report of WHO http://www.who.int/training/icf check list.
Shweta tila taila

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

CORRESPONDING AUTHOR
Dr. Mohamed Nazir KK
Email: mohamednazirkk@gmail.com

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