ABSTRACT

_Samskara_ plays an important role in all formulations in transforming the drug into desired dosage form with better therapeutic value. _Shatadhouta Ghrita_ is one such unique Ayurveda preparation and an example for _Dhauta samskara, Jala samskara_ and _Agni samskara_. It is prepared by two methods. In one method _Ghrita_ (Ghee) is heated, poured in cold water and recollecting _Ghrita_ for one hundred times. In second method _Ghrita_ is washed with water for one hundred times. The Pharmaceutical study showed marked differences in physical parameters and difference in preparation time was also observed in this study.

KEYWORDS: _Ghrita, Samskara, Dhauta_.

INTRODUCTION

_Samskara_ is a procedure adopted in pharmaceutics to induce the therapeutic properties, thereby enhancing the potency and bioavailability of the drugs involved. _Samskarohi naama Gunantaradhanam Uchyate._[1] The methods by which the properties like _Rasa, Guna, Virya, Vipaka_, undergo “_Gunantaradhaanam_” i.e the changing of _Sthoola Guna_ (macro form) to _Sukshma Guna_ (micro form)[2]; there is transformation of physical as well as chemical properties within the _Dravya_ (Substance).

_Shatadhouta Ghrita_ is an Ayurvedic preparation, commonly prescribed for treatment of skin conditions. As the name denotes, it is prepared by washing Ghee one hundred times with...
water [3]. This procedure transforms the ghee into a soft, cooling, nourishing, silky ointment that is used as a traditional moisturizer and anti wrinkle skin cream. [4] Shatadhouta Ghrita is prepared by washing the Ghrita with water till the water turns warm and then the warm water is discarded and fresh water is added and the process is repeated for Hundred times. Vaidayak Shabda Sindukara has explained one more reference about the preparation of Shatadhouta Ghrita by Santapya (Heating) the Ghrita and Nirvapana (Pouring) in Sita Jala (Cold water) for one hundred times.[5] This method is seldom used in pharmaceutics practice and is not popular. Hence, an attempt was made to compare pharmaceutical preparation of Shatadhouta Ghrita by both the methods and understand the pharmaceutical changes that occur by preparing it and it was carried out for ten times with Sagni and Niragni method.

AIM AND OBJECTIVES

- To prepare Shatadhouta Ghrita by Sagni and Niragni method by doing the process for ten times.
- To compare the pharmaceutical observation of both the methods.

MATERIAL AND METHODS

Equipments: - Gas stove, Steel Glass, Thermometer, Spatula, Spoon, Beaker, Measuring cylinder, Holder, Weighing machine.

Method of preparation of Shatadhouta Ghrita: - The whole procedure was divided in two methods.
- Method A - Preparation of Shatadhouta Ghrita by Sagni method for 10 times
- Method B – Preparation of Shatadhouta Ghrita by Niragni method for 10 times.

Method A

- Desired amount of Ghrita (50 g) was taken in steel vessel and started heating on gas stove from a distance of 4 cm to give Mandagni.
- Once Ghrita melted and started boiling it was poured in cold water having temperature of 22°C.
- Once Ghrita got cool, it settled over the water in the form of a layer.
- After self cooling Ghrita was collected with the help of a spoon/ spatula.
- Some watery portion came along with spoon that was removed manually.
Again, the same Ghrita was given mild heat (Mandagni) till it reached a state where the water started to splash.
Again it was poured in cold water temperature of 22\(^{0}\)C.
This process was repeated for ten times.

Method B

- Desired amount of Ghrita (50g) was taken in steel vessel.
- Desired amount of cold water (100 ml) was poured till the Ghrita fully immersed in water.
- The temperature was noted of the Ghrita with water
- It was rubbed well with the help of a steel glass with some pressure till increase in temperature of water was observed.
- Once temperature was increased, water was taken out and it was measured.
- Again fresh water was poured and the same process was repeated for ten times.

OBSERVATIONS AND RESULTS IN METHOD A

- Ghrita melted in 2 minutes during the first time.
- Ghrita boiled at 100\(^{0}\)C.
- Melted ghrita was poured in water. After pouring it spread on the surface of water with a particular sound and formed an emulsion (Fig.5a).
- After pouring, bubbles were seen on the surface.
- Melted Ghrita took 20 minutes to solidify on the water surface (Fig.6a).
- Colour of Ghrita turned slight yellow with increase in weight of 5 g during first Dhauta.
- In 2\(^{nd}\) Dhauta, Ghrita melted in one minute.
- Heating continued before it splashed out and that time, temperature was 90\(^{0}\)C.
- After that melted Ghrita was poured in fresh water.
- Ghrita took 30 minutes for solidification with decrease of 2 g from previous weight.
- Colour of Ghrita turned slight creamish after 4\(^{th}\) Dhauta.
- During 7\(^{th}\) Dhauta it was observed that after solidification, the surface area covered by Ghrita over the water was reduced as compared to earlier Dhauta and the thickness of Ghrita flakes increased (Fig. 9a & Fig. 10a)
• Colour of Ghrita turned into creamish during 9th Dhauta and after 10th Dhauta the colour of Ghrita turned into whitish. The colour resembles to the solidified Coconut oil (Fig 13a & Fig.14a).

• During the Dhauta procedure there was an increase and decrease in weight of Ghrita but finally there was a decrease of 2 g weight in Dhauta Ghrita from the initial weight of plain Ghrita.

• The total weight of Ghrita was 48g.

• Total time was taken 304 minutes in whole procedure.

OBSERVATIONS AND RESULTS IN METHOD B

• Ghrita swelled up while triturating and increase in weight of 43 g during 1st Dhauta.

• Ghrita colour became slightly dull from initial state during 2nd Dhauta.

• After 5th Dhauta colour turned into slight creamish colour but after 10th Dhauta colour of Ghrita became creamish.

• During the Dhauta procedure there was an increase and decrease in weight of Ghrita but finally there was an increase of 37 g weight in Dhauta Ghrita from the initial weight of plain Ghrita. The total weight of Ghrita was 87g.

• Total time was taken 155 minutes in whole procedure.

Table 1: - Organo leptic properties.

<table>
<thead>
<tr>
<th>Organo-leptic properties</th>
<th>Nandini Cow’s Ghee</th>
<th>Method A (Sagni)</th>
<th>Method B (Niragni)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Golden yellow colour</td>
<td>Whitish</td>
<td>Yellow Creamish</td>
</tr>
<tr>
<td>Odour</td>
<td>Typical ghrita smell</td>
<td>Odourless</td>
<td>Odourless</td>
</tr>
<tr>
<td>Taste</td>
<td>Characteristic</td>
<td>Tasteless</td>
<td>Tasteless</td>
</tr>
<tr>
<td>Texture</td>
<td>Granular, Oily</td>
<td>Less granular, More solid as compare to Method B</td>
<td>Non granular, Soft</td>
</tr>
<tr>
<td>Weight</td>
<td>50 g</td>
<td>48g</td>
<td>86g</td>
</tr>
<tr>
<td>Yield</td>
<td>-</td>
<td>96%</td>
<td>172%</td>
</tr>
<tr>
<td>Loss</td>
<td>-</td>
<td>2g (4%)</td>
<td>-</td>
</tr>
<tr>
<td>Gain</td>
<td>-</td>
<td>-</td>
<td>36 (72%)</td>
</tr>
</tbody>
</table>
Table 2: Method A (Preparation of *Shatadhuta Ghrita* by Sagni method for 10 times)

<table>
<thead>
<tr>
<th>Times</th>
<th>Initial Quantity of Ghrita (g)</th>
<th>Obtained quantity of Ghrita (g)</th>
<th>Temperature (in °C)</th>
<th>Melting time (min)</th>
<th>Time taken for solidification of ghrita (min)</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>55</td>
<td>100</td>
<td>2</td>
<td>20</td>
<td>Colour change to slight yellow</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>53</td>
<td>90</td>
<td>1</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>53</td>
<td>51</td>
<td>86</td>
<td>1</td>
<td>31</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>51</td>
<td>52</td>
<td>80</td>
<td>1</td>
<td>35</td>
<td>Colour changed to slight creamish</td>
</tr>
<tr>
<td>5</td>
<td>52</td>
<td>50</td>
<td>84</td>
<td>1</td>
<td>33</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>48</td>
<td>51</td>
<td>100</td>
<td>1</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>51</td>
<td>51</td>
<td>94</td>
<td>1</td>
<td>27</td>
<td>Thickness of <em>Ghrita</em> layer ↑ &amp; Surface area ↓</td>
</tr>
<tr>
<td>8</td>
<td>51</td>
<td>49</td>
<td>100</td>
<td>1</td>
<td>30</td>
<td>Froth seen</td>
</tr>
<tr>
<td>9</td>
<td>49</td>
<td>47</td>
<td>96</td>
<td>1</td>
<td>31</td>
<td>Colour Creamish</td>
</tr>
<tr>
<td>10</td>
<td>47</td>
<td>48</td>
<td>100</td>
<td>1</td>
<td>36</td>
<td>Colour whitish, Smell of <em>Ghrita</em> changed as <em>Purana Ghrita</em></td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>93</strong></td>
<td><strong>1.1</strong></td>
</tr>
</tbody>
</table>

Table 3: Method B (Preparation of *Shatadhuta Ghrita* by Niragni method for 10 times)

<table>
<thead>
<tr>
<th>Times</th>
<th>Initial Quantity of Ghrita (g)</th>
<th>Obtained quantity of ghrita (g)</th>
<th>Initial volume of water (ml)</th>
<th>Decanted water vol. (ml)</th>
<th>Initial water Temp. (In °C)</th>
<th>Degree of Temp. ↑ (In °C)</th>
<th>Time taken in Dhauta (min)</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>93</td>
<td>100</td>
<td>54</td>
<td>24</td>
<td>26</td>
<td>15</td>
<td>Ghrita weight ↑ &amp; swelled</td>
</tr>
<tr>
<td>2</td>
<td>93</td>
<td>93</td>
<td>100</td>
<td>96</td>
<td>24</td>
<td>26</td>
<td>15</td>
<td>Colour slight changed</td>
</tr>
<tr>
<td>3</td>
<td>93</td>
<td>86</td>
<td>100</td>
<td>104</td>
<td>24</td>
<td>27</td>
<td>16</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>86</td>
<td>87</td>
<td>100</td>
<td>95</td>
<td>24</td>
<td>27</td>
<td>22</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>87</td>
<td>87</td>
<td>100</td>
<td>90</td>
<td>24</td>
<td>26</td>
<td>16</td>
<td>Colour changed to slight creamish</td>
</tr>
<tr>
<td>6</td>
<td>87</td>
<td>88</td>
<td>100</td>
<td>98</td>
<td>24</td>
<td>26</td>
<td>14</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>88</td>
<td>87</td>
<td>100</td>
<td>96</td>
<td>24</td>
<td>26</td>
<td>16</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>87</td>
<td>89</td>
<td>100</td>
<td>100</td>
<td>24</td>
<td>26</td>
<td>11</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>89</td>
<td>91</td>
<td>100</td>
<td>96</td>
<td>24</td>
<td>26</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>91</td>
<td>87</td>
<td>100</td>
<td>101</td>
<td>24</td>
<td>26</td>
<td>15</td>
<td>Colour creamish, Smell of <em>Ghrita</em> ↓</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td></td>
<td><strong>100</strong></td>
<td><strong>93</strong></td>
<td><strong>24</strong></td>
<td><strong>26.2</strong></td>
<td><strong>15.5</strong></td>
<td></td>
</tr>
</tbody>
</table>
Plate 1: - Method A – Preparation of *Shatadhauta Ghrita* by Sagni method for 10 times

Fig. 1a. Weight of Ghrita
Fig. 2a. Volume of Ghrita
Fig. 3a. Heating of Ghrita
Fig. 4a. Pouring in cold Water

Fig. 5a. Ghrita- water emulsion
Fig. 6a. Layer of Ghrita on water
Fig. 7a. Removing of Ghrita
Fig. 8a. Ghrita flakes

Fig. 9a. Dhauta Ghrita during 7th time
Fig. 10a. Ghrita flake after cooling
Fig. 11a. Dhauta Ghrita after 9th time
Fig. 12a. Melted Dhauta Ghrita after 10th time

Fig13a. Front view of Dhauta Ghrita after 10th time
Fig14a. Upper view of Dhauta Ghrita after 10th time
Plate 2: - Method B – Preparation of *Shatadhauta Ghrita* by *Niragni* method for 10 times

Fig. 1b. Weight of *Ghrita*

Fig. 2b. Instruments for *Dhauta*

Fig. 3b. Water added in *Ghrita*

Fig. 4b. *Mardana* process

Fig. 5b. *Mardana* process stopped

Fig. 6b. Temperature taken after *Mardana*

Fig. 7b. Decanted water volume

Fig. 8b. Oily particles over decanted water

Fig. 9b. *Ghrita* Measured after 1st *Dhauta*

Fig. 10b. *Dhauta Ghrita* after 10th time
DISCUSSION

*Shatadhauta Ghrita* is a unique Ayurvedic formulation used for the treatment of wounds, burn, skin diseases etc. It is an example of emulsion in which *Ghrita* and water are in immiscible liquid, one of which is dispersed as minute globules into the other.

In Method A, *Ghrita* was heated and poured in cold water (24°C). It results in the formation of oil in water (o/w) emulsion. Because while pouring the hot melted *Ghrita* in cold water the *Ghrita* is broken up into globules which denote *Ghrita* as dispersed phase and water denotes as continuous phase.

Melted *Ghrita* became solid and accumulated over the surface of water. That ghrita was taken out and there was 5 g increase in weight during 1st *Dhauta*. The reason may be the passage of water globules in fat molecules by forming water oil (w/o) emulsion. Here water molecules are considered as dispersed phase and fat molecules (*Ghrita*) are considered as continuous phase.

The application of energy in the form of heat, mechanical agitation is required to reduce the internal phase in small droplets. Heating is an effective way of breaking almost all the bonds between the molecules of a liquid. In method A, *Ghrita* was heated so there may be weakness or breakage of bonds in the molecules of *Ghrita* and when *Ghrita* comes in contact with water fat splitting process might takes place (Fig.1).

When the melted *Ghrita* was poured into cold water suddenly it spread over the surface of water because the density of water is more than density of *Ghrita* and there is an unequal attractive force between water and *Ghrita* molecules.

After 1st Dhauta splashing of *Ghrita* was noticed during heating *Ghrita*. Because some water portions always come during recollecting the Ghrita after each *Dhauta*. During heat, water at the bottom of the vessel being heated very rapidly turns into steam and forms cavitations in Ghrita. Due to pressure generated by heat it shoots up with a sound and is termed as splash. In Method B, *Ghrita* was triturated along with water and thus formation of water oil (w/o) type of emulsion because water is in dispersed phase and oil is in continuous phase. As the washing continues, due to pressure applied during agitation, particle size of fat granules gets reduced (as per texture it was non granular and smooth). Eventually, successive washings result in o/w type of emulsion. It is possible that it might lead to formation of a complex
system like w/o/w emulsion. The reason may be passage of water globules in fat molecules by forming water oil (w/o) emulsion and leads to swelling of Ghrita.

In Method B, during triturating average 2.2°C temperature was increased and there is repeated and prolonged trituration of the fat and water mixture. Thus, the temperature and pressure factor may be contributing for fat splitting (Fig.1). The yellow coloring arrives from beta carotene in the cow’s butterfat. Due to heating and again washing with water the pigment may leak out into water and change in the colour takes place after washing (Dhauta). Method A, Dhauta Ghrita was more whitish than Method B. Because in Method A, heat is the additional factor which may facilitates rapid expulsion of beta carotene from Ghrita than Method B.

![Figure 1: Fat Splitting process](image)

CONCLUSION

Shatadhauta Ghrita is a widely practiced topical application to cure skin disorder and for skin burn cases. There are two methods of preparation mentioned for this Ayurvedic formulation, one is heating Ghrita and pouring in cold water, then recollecting it from that cold water, again heat it and pour in water. In second method water is added to Ghrita and rubbed with pressure till some time and change that water and again water pour in the same. Both the process is repeated for hundred times.

The solution is formed here, is an example of an emulsion where Ghrita and water are immiscible. Oil-water (o/w) emulsions are most useful as water-washable drug bases and for general cosmetic purpose. Water-oil (w/o) emulsions are employed more widely for the treatment of dry skin and emollient applications.
Both the methods are easy for the preparation of *Shatadhauta Ghrita*. But from pharmaceutical point of view Method A (Heating method) the yield is less; time consumption is more and requires heating process is required rather than Method B (Non-heating). Analytical studies should be carried out to compare the constituent changes occurring in the *Ghrita* in both methods. A clinical study also has a wide scope to revalidate the efficacy and safety of the *Shatadhauta Ghrita* prepared by both methods.

REFERENCES