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A COMPARATIVE PHARMACEUTICO-ANALYTICAL STUDY OF PINDA SNEHA USING TAILA AND GHRITA AS SNEHA DRAVYA

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ABSTRACT

Background: *Sneha Kalpana* is one among those preparations derived from the basic *Kalpanas* prepared using either *Ghrita* or *Taila*. Out of these, *Ghrita* is considered to be the best because of its unique nature of incorporating the properties of the drugs with which it comes in contact, without leaving its own natural qualities. *Taila* is the best *Sneha* for the pacification of *Vatarogas* and is said to be predominantly used externally. Hence usually *Ghrita* (Ghee) or *Taila* (oil) are used as media of extraction where as in rare cases *Vasa* and *Majja* are used. The *Sneha* used in the preparation imbibes the qualities of the drugs used as *Kalka Dravya*, thereby making the *Sneha* therapeutically active. References are available for the contents and preparation of *Pinda Taila*. Studies are also done evaluating the analytical and clinical efficacy of *Pinda Taila*. But till date no studies have recorded the preparation of *Pinda taila* in other *Sneha Dravya's* such as *Ghrita* or *Vasa*, in spite of the therapeutic value which can be incorporated into the raw materials enhancing its absorption into the biological systems. Hence, considering this fact, an attempt has been made to study and explore the value of *Ayurvedic* concept of *Sneha Kalpana* in *Taila* and *Ghrita*, wsr to Pharmaceutical preparation of *Pinda Taila* by using modern analytical parameters. **Aims and Objectives:** Comparative Pharmaceutical Analysis of *Pinda Sneha* prepared from 2 different types of *Sneha's – Taila* and *Ghrita*. **Methodology:** The present study was carried out in two steps namely;

pharmaceutical and analytical. In the pharmaceutical study, as the preparation of *Pinda Ghrita* is not mentioned in the classics, the ingredients mentioned from *Charaka Samhitha* was chosen for the study and the general method of *Taila* preparation as mentioned by *Sharangadhara Samhitha* was adopted. In the analytical study, all the two prepared samples were subjected to various analytical parameters and chromatography techniques for 0^{th}, 1^{st}, 6^{th} and 12^{th} months and were compared. Organoleptic evaluation of colour, odour and appearance were also carried out for the samples. **Results:** In the organoleptic study of the 2 samples showed slight rancidity for both the samples. With the analytical study conducted for 0^{th}, 1^{st}, 6^{th} and 12^{th} month of the prepared samples, the conclusion of the study was difficult and only a detail further study of both in-vitro and clinical are needed for the validation and scientific establishment of the data.

KEYWORDS: *Pinda Taila, Ghrita*, Analytical study.

INTRODUCTION

Sneha Kalpana is one among the unique secondary formulation derived from the basic Kalpanas. It is one of the commonly prescribed Ayurvedic dosage forms in day to day practice. Classically these formulations have longer shelf life in comparison to other Ayurvedic herbal medication form. Sneha Siddha (fat soluble) drugs have better pharmacokinetic action (ADME) in comparison to other dosage forms because of the lipoid nature of the biomembranes, as lipid soluble substances readily permeate into the cells.[1] Sneha's are of 4 types – Sarpi, Taila, Vasa and Majja.[2] Go Ghrita and Tila Taila are considered as the best Sneha among all Jangama and Sthavara snehs's respectively.[3] Out of these Ghrita is considered to be the best because of it's unique nature of incorporating the properties of the drugs with which it comes in contact, without leaving it's own natural qualities. The use of Ghrita as a base is presumably to extract or hold lipid soluble active fraction from the ingredients used. Taila is the best Sneha for the pacification of Vatarogas and is said to be predominantly used externally. Pinda Taila[4] and Ghrita are the outcome of the search for the effective among the two sneha's, i.e both Pinda Taila and Pinda Ghrita were pharmaceutically prepared keeping uniformity in each batch and analysed to develop the standards for the formulations through physico-chemical analysis and chromatographic profiling. Along with this shelf life study of both the prepared samples were done for 0, 1^{st}, 6^{th} and 12^{th} month under normal room temperature and humidity with the help of both analytical and organoleptic evaluations.

MATERIALS AND METHODS

The conversion of a Dravya into a Kalpana includes a step-wise process starting from the identification and procurement of the genuine Dravya, processing it with suitable Samskara (pharmaceutical procedures), extracting the desired components of the Dravya i.e most acceptable by the body and lastly the storage of the prepared medicament.

Pharmaceutical source

Raw drugs required for the preparation of Pinda Taila and Pinda Ghrita such as – Taila, Ghrita, Manjishta, Sarjarsa, Sariva and Madhuchishta were collected from KVG Ayurveda Pharma and Research Center, Sullia.

Method of collection of data

Pinda Taila and Pinda Ghrita were prepared according to the general Sneha Kalpana preparation adopted from Sharangadhara Samhitha.[5]

Preparation of churna of raw drugs for kalka preparation[6]

The raw drugs i.e Manjishta and Sariva were thoroughly dried in drier at 100°C for 30minutes, for consecutive 3 days before subjecting them for powdering. After confirming that the drugs had properly dried, they were powdered separately in the Khalwa Yantra. The remaining two drugs i.e Sarjarasa was powdered in Ulukhala Yantra and Madhuchishta was cut into small pieces so that they would easily be dissolved in Taila.

Preparation of kalka[7]

The accurately measured quantities of Manjishta and Sariva was sieved and made into a homogeneous mixture first. To that same mixture, required quantity of water was added whenever required and grinded until a smooth paste is obtained and the paste converted into a bolus. This Kalka was further used for the purpose of Pinda Taila and Ghritha preparation.

Preparation of pinda Taila & Pinda ghrita

Initially Sneha was taken in a big vessel and was added with Jala and Kalka and the boiling was started. The quantity of ingredients taken for Pinda Taila and Ghrita preparation are mentioned in the table 1. The boiling was continued until all the moisture content was evaporated from the Sneha and all the Sneha Siddhi Lakshanas were appreciated and heating was stopped at Madhyama Paka stage. The temperature maintained for the Sneha Paka for Taila was between 90°-110°C and for Ghrita was between 90-120˚C. The Temperature chart

is depicted in the table 2. Once the Lakshana's were attained, heating was stopped and filteration was done. The filtration was done through a clean and thick double folded kora cloth in a stainless steel vessel containing Sarjarasa and Madhuchishta. The Sneha was continuously stirred during filtration to dissolve Sarjarasa and Madhuchishta properly. After complete dissolution of Sarjarasa and Madhuchishta, the Sneha was once again filtered to remove the physical impurities, if any, in Madhuchishta. Later, the Sneha was allowed to cool down and was stored in air tight containers.

Table no. 1: Quantity of ingredients taken for *pinda Taila & Ghrita* preparataion.

Si no.	Pinda taila		Pinda ghrita	
01.	*Kalka* (each 25gm)	100gm	*Kalka* (each 25gm)	100gm
02.	*Tila taila*	400ml	*Go ghrita*	400ml
03.	*Jala*	1600ml	*Jala*	1600ml

Table no. 2: Temperature pattern followed for *pinda Taila* & Pinda ghrita.

Time in hours	Temperature of Pinda Taila	Temperature of Pinda Ghrita
Room temperature before starting the procedure	32˚C	32˚C
After 1 hr	57˚C	57˚C
After 2 hrs	73˚C	73˚C
After 3 hrs	95˚C	95˚C
After 4 hrs	108˚C	103˚C
After 5 hrs	115˚C	110˚C
After 6 hrs	120˚C	110˚C

Analytical study

Analytical study provides the objective parameters to fix up the standards for quality of any drugs, in process as well as finished products. To establish the assessment of quality control over a drug, analytical study is necessary. In this study, the analytic phase includes the organoleptic and physico-chemical evaluation along with thin layer chromatography (TLC) study. The organoleptic characters examined were color, odour and appearance/consistency. While the analysed physico-chemical parameters were pH, specific gravity, refractive index, viscosity, acid value, iodine value, saponification value, peroxide value and rancidity. These data of the formulations were compared for evaluating the most suitable one among both.

TLC study

TLC study of the sample was carried out to develop a chromatographic pattern. It was done by mixing 5ml of sample and 20ml of methanol and kept for extraction at a speed of 700rpm

for 20minutes and by keeping undisturbed for 3hours and then by reducing it into 5ml by evaporating over heating mantle. The visualization was done under UV 366nm and UV 254nm in ordinary light. The details of the chromatograms obtained were noted and compared.

Shelf-life study

The prepared samples were evaluated for their shelf-life under natural conditions by maintaining the normal room temperature and humidity. The samples were examined with the help of organoleptic methods, physico-chemical parameters and TLC study for the 0, 1st, 6th and 12th month. The results of the study were noted and compared for evaluating the samples.

OBSERVATIONS AND RESULTS

General observations

Both the Sneha Kalpana (Pinda Taila and Pinda Ghrita) were processed upto the achievement of all the classical Siddhi Lakshana (Completion characteristics) like Gandha Varna Rasotpatti (Desirable smell, color and taste), Shabdahino agni nikshipath i.e fire test in Kalka and Taila (when sneha or kalka kept on fire there must not be any cracking sound) Phenodgama (Frothing), Vartivat kalka (The paste of herbal drug can be rolled in between fingers), etc. All the above characters were elicited at the end of Sneha Paka which advocated different levels of moisture in the prepared sample. The total duration and yield for Taila paka was observed to be 6 hours and 380ml, whereas for Pinda Ghrita it was 6 hours and 390ml respectively. Sarjarasa was found difficult to get melted in the sample, hence Paatra paka method was adopted to dissolve it completely in the prepared Sneha. Filteration of the Sneha was found difficult after the addition of both Sarjarasa and Madhuchishta as the cloth became sticky and was blocking the flow of the Sneha.

Specific observations

Organoleptic characters – the organoleptic characters of both samples of Pinda Taila and Pinda Ghrita were analysed for 0, 1st, 6th and 12th month and are enlisted in Table 3, 4, 5 and 6.

Physico-chemical parameters – comparative physico-chemical parameters of both Pinda Taila and Pinda Ghrita were examined for 0, 1st, 6th and 12th month and are presented in Table 7, 8, 9 and 10.

Chromatographic study – the Rf values from the chromatograms of both Pinda Taila and Ghrita under UV 366nm and UV 254nm in ordinary light are presented in table 11, 12, 13 and 14. The comparative TLC chromatograms of Pinda Taila and Pinda Ghrita for 0, 1st, 6th and 12th month are shown in Fig, 1, 2, 3 and 4.

Table no. 3: Showing the results of 0th month organoleptic study.

Characters	*Pinda taila*	*Pinda ghrita*
Colour	Orangish brown	Light orangish brown
Odour	*Tila Taila* & wax smell	*Ghrita* smell
Appearance	Slightly thick	Much thicker than *Taila*

Table no. 4: Showing the results of 1st month organoleptic study.

Characters	*Pinda taila*	*Pinda ghrita*
Colour	Orangish brown	Light orangish brown
Odour	*Tila Taila* & wax smell	*Ghrita* smell
Appearance	Slightly thick	Much thicker than *Taila*

Table no. 5: Showing the results of 6th month organoleptic study.

Characters	*Pinda taila*	*Pinda ghrita*
Colour	Orangish brown	Light orangish brown
Odour	Characteristic smell of *Pinda Taila*	*Ghrita* smell
Appearance	Settled into 2 layers- brownish orange upper layer & light orange thicker bottom layer	Thicker

Table no. 6: Showing the results of 12th month organoleptic study.

Characters	*Pinda taila*	*Pinda ghrita*
Colour	Orangish brown colour	Dark orange colour
Odour	Slight rancid smell	Slight rancid smell
Appearance	Settled into 2 layers- plain *Taila* upper layer & brown thick bottom layer	Very thick & rigid, with no movement.

Table no. 7: Showing the results of 0th month of analytical study.

Sl. No	Analytical parameters	*Pinda Taila*	*Pinda Ghrita*
1	pH Value	5-6	5-6
2	Specific Gravity	0.919	0.966
3	Viscosity	-	-
4	Refractive Index	1.47	1.46

5	Saponification value	184.3	213.2
6	Peroxide Value	7.13	1.70
7	Acid Value	0.68	1.5
8	Iodine Value	102.9	32.108
9	Rancidity	Not rancid	Not rancid

Table no. 8: Showing the results of 1st month of analytical study.

Sl. No	Analytical parameters	*Pinda Taila*	*Pinda Ghrita*
1	pH Value	5-6	5-6
2	Specific Gravity	0.919	0.966
3	Viscosity	-	-
4	Refractive Index	1.47	1.46
5	Saponification value	185.7	214.9
6	Peroxide Value	7.22	1.71
7	Acid Value	0.72	1.50
8	Iodine Value	103.5	32.164
9	Rancidity	Not rancid	Not rancid

Table no. 9: Showing the results of 6th month of analytical study.

Sl. No	Analytical parameters	*Pinda taila*	*Pinda ghrita*
1	pH Value	5-6	5-6
2	Specific Gravity	0.919	0.940
3	Viscosity	-	-
4	Refractive Index	1.47	1.46
5	Saponification value	190.3	219.5
6	Peroxide Value	11.14	2.02
7	Acid Value	0.910	1.52
8	Iodine Value	119.3	38.18
9	Rancidity	Not rancid	Not rancid

Table no. 10: Showing the results of 12th month of analytical study.

Sl. No	Analytical parameters	*Pinda taila*	*Pinda ghrita*
1	pH Value	5-6	5-6
2	Specific Gravity	0.923	0.928
3	Viscosity	-	-
4	Refractive Index	1.471	1.461
5	Saponification value	196.63	228.61
6	Peroxide Value	16	3.96
7	Acid Value	1.01	1.68
8	Iodine Value	141.05	46.53
9	Rancidity	Slight rancid	Slight rancid

Table no. 11: Showing the results of 0th month of chromatography study.

Major spot	Color	Pinda Taila	Pinda Gritha	Approx.Rf
1	Blue	Present	Present	0.370
2	Light green	Present	Absent	0.407

3	Pink	Present	Present	0.432
4	Light blue	Present	Present	0.608

Table no. 12: Showing the results of 1st month of chromatography study.

Major spot	Color	Pinda taila	Pinda gritha	Approx.Rf
1	Blue	Present	Present	0.437
2	Light green	Present	Absent	0.50
3	Pink	Present	Present	0.537
4	Light blue	Present	Present	0.737

Table no. 13: Showing the results of 6th month of chromatography study.

Major spot	Color	Pinda taila	Pinda gritha	Approx.Rf
1	Blue	Present	Present	0.437
2	Light green	Present	Absent	0.50
3	Pink	Present	Present	0.537
4	Light blue	Present	Present	0.737

Table no. 14: Showing the results of 12th month of chromatography study.

Major spot	Color	Pinda taila	Pinda gritha	Approx.Rf
1	Pink	Present	Present	0.175
2	Blue	Present	Present	0.225
3	Yellow	Present	Present	0.625
4	Light blue	Present	Absent	0.662
5	Blue	Present	Present	0.887

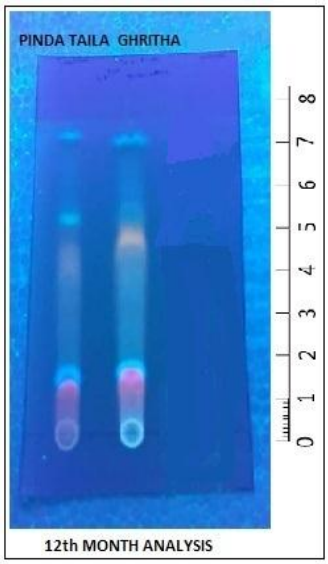

Fig 1

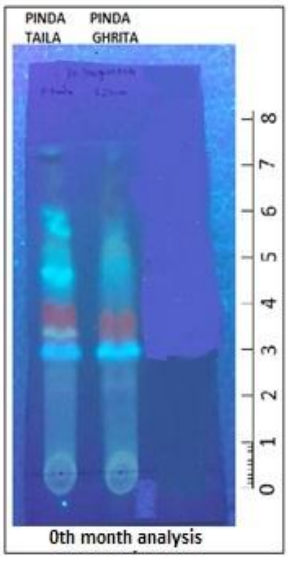

Fig 2

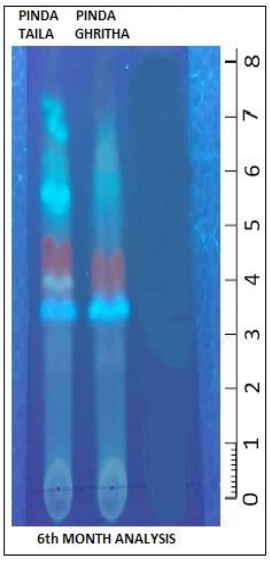

Fig 3

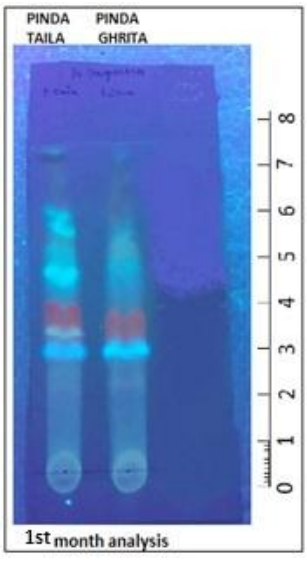

Fig 4

DISCUSSION

Sneha Kalpana is one of the commonly prescribed Ayurvedic dosage form in day to day practices, mainly for the management of Vata related ailments. Although a lot of varieties of

Sneha are explained in the classics, but the most common amongst them are Taila and Ghrita Kalpana. Acharya Sushruta explained Tila Taila and Go Ghrita as the best among the Taila and Ghrita's explained. Pinda Taila and Pinda Ghrita were prepared out of same drugs and were taken for the study to evaluate the most suitable amongst them with reference to analytical parameters and shelf-life study.

Pinda taila is named so because of the Pinda like or semi solid appearance of the final product which can be explained due to the presence of Sarjarasa and Madhuchihsta in the formulation. The reference of Pinda taila are found to be similar in Charaka Samhitha, Ashtanga Hridaya, Bhaishajya Ratnavali and Sahasrayoga. These textbooks had Sariva, Sarjarasa, Manjishta and Madhuchishta as Kalka Dravyas, Jala as Drava Dravya and Tila Taila as the Sneha Dravya.

Preparation of both Pinda taila and Pinda Ghrita were done with reference of Charaka Samhitha. Among the 4 Kalka Dravya's mentioned, the Sneha Paka was initially carried out with only Manjishta and Sariva. If Sarjarasa and Madhuchishta were also added as the kalka Dravya's to carry out the Paka, then the assessment would have been difficult as there will be constant frothing of the liquid during boiling, due to the presence of Sarjarasa. And the constant frothing will make the assessment of Sneha Siddhi Lakshana's like Phenodgama in Taila or Phenashanthi in Ghrita difficult. Sarjarasa was not getting melted and mixed in both Taila and Ghrita after filteration, hence Paatrapaka method was adopted for the extended time of mixing and also for not changing the Paka of the preparation. 400ml each of plain Tila Taila and Go Ghrita were taken for the preparation where 380ml of Pinda taila and 390ml of Pinda Ghrita were obtained as end product.

Organoleptic characters assessed for 0, 1st, 6th and 12th month of the study showed significant changes for both the samples. The prepared sample of Pinda taila when observed for the respective time period showcased colour change from orangish brown in the first 6 months to dark brown in the last 6 months. While, Pinda Ghrita showed light orangish brown color in the first 8 months followed by a slight dark orangish brown in the last months of notice period. The color of the preparation can be attributed to one of the Kalka dravya, i.e Manjishta, as it act as an important source of red pigment in both the prepared samples due to anthroquinone called purpurin present in it's roots. The light color in Pinda Ghrita can be due to the plain Ghrita which was bright yellow in color, which might have reduced the darkness of the sample when compared to taila. The smell of the preparation completely depends upon

the Kalka Dravya's used along with the Sneha Dravya in which it is prepared. The prepared sample of Pinda taila had the smell of Tila Taila just after the preparation and it sustained for a few days of the first week and later on the specific characteristic smell of Pinda taila was noticed. The prepared sample of Pinda Ghrita had the smell of Ghrita from the starting and it sustained for 12 months with slight rancid smell which was observed from the 10th month. The appearance of both the samples completely depends upon the Sneha Dravya used along with the Sarjarasa and Madhuchishta in the preparation. The thickness and consistency of both the samples differed from each other. The prepared sample of Pinda taila was like any normal Taila prepared, but the end product after packing was observed slightly thick having semi-solid consistency, which can be signified by the addition of Sarjarasa and Madhuchishta in the end of the preparation. The prepared sample of Pinda Ghrita was thicker than the taila prepared. This was because of the Ghrita, Sarjarasa and Madhuchishta added in the sample. Ghrita being thicker than Taila ensured the increased thickness of the prepared sample of Pinda Ghrita. After 6 months of preparation, the sample seemed to be more thick with no movement and felt like ointment in appearance.

The measurable physical characteristics of the prepared samples like pH were same in the months of study and it was quite difficult to analyse the colour change in the litmus paper, as the formulation was already having colour. The standard specific gravity mentioned for Pinda Taila as per API was 0.92 and both the samples showed significant changes during the initial time period but was seen equivalent in the 12th month. Viscosity was difficult to analyse as none of the samples moved from point A to point B in viscometer, which signifies high resistance towards the flow of the Taila and Ghrita in semi-solid nature.

The physico-chemical characters showed no much significant changes between the prepared samples. The standard Acid value of Pinda Taila as per API was said to be not more than 5, and in this study Taila showed less acid value maybe because of the absence of moisture content in it when compared to the other. Even though the standard iodine value of Pinda Taila was mentioned as 100-110, the value was seen more than the permissible range in the 12th month indicating increased degree of unsaturation and more chances of rancidity which when compared to Ghrita was more. The standard saponification value of Pinda Taila is said to be 173-189 and in the present study, the value of Taila has increased significantly in the 12th month, whereas Pinda Ghrita had the values in the normal permissible values of the Ghrita formulations which signifies more absorption rate in it. The sample prepared with

Ghrita was found to have least peroxide value, when compared with the other sample signifying least chance for oxidation. Rancidity of both the samples were difficult to analyse as the sample was already presented with a specific color.

The chromatographic separation of individual component from the mixture in the prepared samples showed extra colour spots in all months of the study when compared with Ghrita.

Raw materials used for the preparation

Fig. no. 4: Sariva.

Fig. no. 5: Manjishta.

Fig. no. 6: Sarjarasa.

Fig. no. 7: Madhuchishta.

Fig. no. 8: Tila taila.

Fig. no. 9: Ghrita pictures of kalka prepared.

Fig. no. 10: Sariva kalka.

Fig. no. 11: Manjishta kalka.

Pictures of pinda taila preparation

Fig. no. 12: Ingredients of pinda taila preparation.

Pictures of pinda ghrita preparation

Fig. no. 13: Ingredients of pinda ghrita.

CONCLUSION

Considering the explanation of Chaturvidha Sneha's explained by the Acharyas, an attempt was made to prepare and evaluate Pinda Taila and Pinda Ghrita pharmaceutically, analytically and with shelf life study for 0^{th}, 1^{st}, 6^{th} and 12^{th} month. Scanning the analytical data of the prepared samples, apart from acid value all other parameters tested for 12 months showed Ghrita better than Taila. But the TLC spots showed extra spots in Taila which can be due to the absorption of extra ingredient in it. Hence the conclusion of the study was difficult and only a detail further study of both in-vitro and clinical are needed for the validation and scientific establishment of the data.

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