

Review Article



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“IMPORTANCE OF SNEHA KALPANA IN AYURVEDIC THERAPEUTICS: A PHARMACOLOGICAL AND CLINICAL REVIEW”**Ms. Priya Bhaware¹****AFFILIATIONS:**

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ABSTRACT

Introduction: Sneha Kalpana, one of the most significant dosage forms in Ayurveda, involves the medicated processing of lipids such as ghee (ghrita) and oil (taila) with herbal decoctions and pastes. These formulations, widely employed for both internal and external therapies, are central to Panchakarma and Rasayana practices. The unique lipid-based delivery enhances drug absorption, bioavailability, and tissue penetration, making Sneha Kalpana highly relevant in modern pharmaceuticals. **Methods:** A comprehensive literature search was conducted in PubMed, Scopus, Web of Science, and AYUSH Research Portal, supplemented by classical Ayurvedic texts including Charaka Samhita, Sushruta Samhita, and Bhaishajya Ratnavali. Inclusion criteria comprised pharmacological, experimental, and clinical studies focusing on Sneha Kalpana and its therapeutic role. Exclusion criteria were non-Ayurvedic lipid formulations and studies with insufficient methodology. **Results:** Evidence indicates that Sneha Kalpana enhances the solubility of hydrophobic phytoconstituents, improves drug delivery through lipophilicity, and supports tissue-level activity. Classical texts highlight its role in Vata-related disorders, metabolic diseases, and Rasayana therapy. Modern research validates antioxidant, anti-inflammatory, neuroprotective, and hepatoprotective properties of ghrita and taila-based formulations. Clinical trials demonstrate efficacy in neurological disorders (e.g., epilepsy, dementia), dermatological conditions, and gastrointestinal diseases. **Discussion:** Sneha Kalpana represents an ancient lipid-based drug delivery system with significant pharmacological implications. However, standardization challenges, lack of large-scale clinical trials, and limited regulatory recognition hinder global acceptance. Bridging traditional wisdom with advanced lipidomics, nanotechnology, and pharmaceuticals may expand its therapeutic potential. **Conclusion:** Sneha Kalpana, with its unique pharmaceutico-therapeutic approach, holds promise as a natural, effective, and safe drug delivery system. Integration with modern pharmaceutical sciences may pave the way for its global recognition and application in chronic and lifestyle-related disorders.

KEYWORDS: Ayurveda, bioavailability, lipid-based formulations, Sneha Kalpana, therapeutics

INTRODUCTION

Ayurveda, the traditional system of Indian medicine, has provided numerous pharmaceutico-therapeutic innovations, among which Sneha Kalpana holds a central place^[1]. The concept is based on the principle that lipids, when processed with herbal drugs, acquire therapeutic properties that allow deeper penetration into tissues^[2-3]. Sneha (lipid) is considered both a carrier and a therapeutic agent, being nourishing, lubricating, and pacifying, especially for Vata and Pitta doshas^[4].

Historically, Sneha Kalpana is well-documented in classical treatises such as Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya. It is prescribed in both preventive and curative contexts, ranging from Rasayana (rejuvenation) to Panchakarma (purification therapies)^[5-6]. The pharmacological rationale lies in its ability to extract and retain both water-soluble and fat-soluble constituents, thereby making the formulation highly potent^[7-8].

The present review aims to critically evaluate Sneha Kalpana from classical, pharmacological, and clinical perspectives. The objectives are to (i) analyze the importance of Sneha Kalpana in Ayurvedic therapeutics, (ii) summarize pharmacological mechanisms supported by modern evidence, (iii) assess clinical applications across disease spectrums, and (iv) identify future prospects for integrative medicine^[9-10].

MATERIALS AND METHODS

A systematic review was conducted using Ayurvedic classical texts (Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Bhaishajya Ratnavali, Sharangadhara Samhita) alongside modern pharmacological and clinical research databases (PubMed, Scopus, Web of Science, AYUSH Research Portal)^[11-12].

- **Databases searched:** PubMed, Scopus, Web of Science, AYUSH Research Portal.
- **Keywords used:** “Sneha Kalpana,” “ghrita,” “taila,” “Ayurveda lipid formulations,” “Ayurvedic pharmaceutics.”^[13]
- **Inclusion criteria:** Articles discussing pharmacological properties, clinical efficacy, or pharmaceutical principles of Sneha Kalpana; experimental and clinical studies; references to classical texts with therapeutic applications^[14].

- **Exclusion criteria:** Non-Ayurvedic lipid formulations, studies lacking methodology, anecdotal reports without peer-reviewed data^[14].
- **Study types reviewed:** Classical Ayurvedic references, in vitro studies, in vivo pharmacological research, clinical trials, and review articles^[15].

OBSERVATION AND RESULTS

1. Conceptual Foundation of Sneha Kalpana in Ayurveda

Sneha Kalpana is described as a distinct branch of Ayurvedic pharmaceutics, involving the processing of lipids (ghrita, taila, vasa, majja) with herbal drugs in specific proportions. Charaka, Sushruta, and Vagbhata have all emphasized Sneha as a crucial therapeutic agent. The term “sneha” itself implies lubrication, nourishment, and affection, symbolizing its physiological and therapeutic significance. According to Ayurveda, sneha has gunas (qualities) like *guru* (heavy), *mridu* (soft), *snigdha* (unctuous), and *manda* (slow), which help pacify aggravated Vata and Pitta doshas, improve strength, and support tissue rejuvenation (*dhatu poshana*).

The pharmaceutico-therapeutic rationale rests on the ability of lipids to capture both hydrophilic and lipophilic phytoconstituents during processing with decoctions (*kvatha*) and pastes (*kalka*). The formulations thus prepared exhibit enhanced potency and longer shelf life compared to aqueous extracts.

2. Types of Sneha Kalpana

Classical texts describe four primary lipid bases:

- **Ghrita (clarified butter/ghee):** Considered the best medium due to its ability to carry both hydrophilic and lipophilic drug components, penetrate tissues, and cross the blood-brain barrier. Used extensively in neurological, psychiatric, and ophthalmic disorders.
- **Taila (medicated oils):** Prepared from sesame, coconut, mustard, or castor oil, these are primarily employed for external therapies (abhyanga, nasya) and certain internal indications.
- **Vasa (muscle fat) and Majja (bone marrow fat):** Less frequently used but specifically indicated in chronic Vata disorders and tissue-depleting conditions.

3. Pharmaceutical Principles

The classical method of Sneha Kalpana involves three components:

1. **Sneha dravya (base lipid):** Ghrita or taila.
2. **Kalka dravya (paste of herbs):** Fine herbal paste supplying active principles.
3. **Drava dravya (liquid medium):** Decoction, juice, or other suitable liquids.

The mixture is subjected to heating under *mridu agni* (mild fire) until characteristic tests (*siddhi lakshana*) are achieved, ensuring stability and potency. This controlled heating allows for optimal transfer of active principles into the lipid medium.

4. Pharmacological Insights and Bioavailability

Modern pharmacological studies validate that lipids enhance the solubility, absorption, and transport of phytoconstituents. Ghee and oil act as carriers for hydrophobic bioactives such as curcumin, withanolides, and alkaloids. Additionally, lipids improve lymphatic absorption, bypassing first-pass metabolism, thus enhancing systemic bioavailability.

Ghrita-based formulations such as Brahmi Ghrita and Panchagavya Ghrita have been reported to possess neuroprotective, anti-inflammatory, antioxidant, and anxiolytic effects in experimental models. Taila formulations such as Ksheerabala Taila demonstrate analgesic and neuroprotective activity.

5. Therapeutic Indications in Classical Texts

- **Neurological and psychiatric disorders:** Ghrita is specifically mentioned in epilepsy (*apasmara*), insanity (*unmada*), and memory disorders (*smriti bhramsha*).
- **Gastrointestinal diseases:** Ghrita is used in chronic peptic ulcers, colitis, and hemorrhoids for its soothing and healing effects.
- **Skin disorders:** Taila preparations are used for *kushta* (skin diseases), *vrana* (wounds), and *shvitra* (leucoderma).
- **Rasayana therapy:** Ghrita-based preparations are employed as rejuvenators and immunomodulators.
- **Panchakarma procedures:** Sneha Kalpana is the foundation for *snehana* (oleation therapy), both internal (*snehapana*) and external (*abhyanga*), essential for detoxification and purification.

6. Clinical Evidence of Sneha Kalpana

Several clinical trials have assessed Sneha formulations:

- **Neurological disorders:** Brahmi Ghrita has shown improvement in cognitive function in dementia and epilepsy patients. A study reported significant memory-enhancing effects in children with learning disabilities.
- **Psychiatric conditions:** Kalyanaka Ghrita has been used in anxiety and depression with favorable outcomes.
- **Gastrointestinal disorders:** Ghrita-based formulations demonstrated gastroprotective effects in peptic ulcer patients, attributed to antioxidant and mucoprotective activity.
- **Dermatology:** Taila formulations like Jatyadi Taila are widely used in wound healing and skin lesions, with clinical trials supporting faster epithelialization and reduced infection rates.
- **Ophthalmology:** Ghrita-based formulations such as Triphala Ghrita are used for *netra tarpana* (eye rejuvenation therapy), showing benefits in dry eye syndrome and early cataracts.

7. Pharmacokinetics and Modern Research

Studies show that ghrita formulations facilitate brain-targeted delivery due to their lipid-soluble nature. For example, ghee-based formulations enhance curcumin bioavailability, leading to superior neuroprotective effects. Taila formulations also support transdermal and mucosal absorption, validating their role in external therapies.

Animal studies have confirmed hepatoprotective, cardioprotective, and neuroprotective properties of Sneha formulations. For instance, Brahmi Ghrita reduced oxidative stress markers in Alzheimer's models, while Ksheerabala Taila improved motor function in neuropathy models.

8. Safety Profile and Toxicological Considerations

Sneha Kalpana is generally considered safe when prepared and administered as per classical guidelines. However, excessive use or improper preparation can cause *ama* (metabolic toxins), indigestion, or lipid imbalance. Modern studies confirm its safety profile, though concerns about hyperlipidemia exist, necessitating proper dosing and patient-specific selection.

9. Modern Applications and Opportunities

- **Drug delivery system:** Sneha Kalpana can serve as a natural lipid-based drug delivery system comparable to liposomes and nanoemulsions.
- **Neuropharmacology:** Ghrita formulations hold promise for neurodegenerative disorders like Alzheimer's and Parkinson's.
- **Dermatology and wound healing:** Taila formulations may be integrated with modern wound dressings for improved outcomes.
- **Nutraceuticals and functional foods:** Ghrita-based Rasayana formulations can be developed as preventive healthcare supplements.

10. Challenges in Global Acceptance

- Lack of standardized preparation protocols.
- Variability in raw materials and processing methods.
- Limited large-scale randomized clinical trials.
- Regulatory barriers for approval outside India.

DISCUSSION

Sneha Kalpana exemplifies a classical lipid-based drug delivery system, centuries ahead of its time. Modern pharmacology validates the lipid-solubility principle, where fat enhances bioavailability of hydrophobic phytochemicals^[16]. Ghrita formulations, for example, are shown to enhance brain-targeted delivery due to their ability to cross the blood-brain barrier, which corroborates their traditional use in epilepsy and neurodegeneration^[17]. However, gaps exist. Clinical trials are often limited in scale and methodological rigor, and standardization of raw materials, preparation methods, and storage conditions remains a challenge^[18]. Unlike synthetic lipid nanoparticles in pharmaceuticals, Sneha Kalpana lacks universally accepted parameters for quality assurance. Regulatory frameworks such as WHO-GMP and AYUSH guidelines are still evolving for such formulations^[19].

Future prospects lie in integrating Sneha Kalpana with modern technologies. Encapsulation, nanoemulsion, and lipidomics can validate and optimize these formulations for targeted delivery. Comparative studies with established lipid carriers in pharmaceuticals may further strengthen evidence^[20].

CONCLUSION

Sneha Kalpana, with its unique combination of therapeutic lipids and herbal extracts, stands as a cornerstone of Ayurvedic therapeutics. The evidence demonstrates its role in enhancing drug solubility, absorption, and tissue-specific delivery. Clinical applications extend to neurological, metabolic, dermatological, and gastrointestinal conditions, validating classical claims.

Despite its significance, Sneha Kalpana remains underexplored in modern pharmaceutical frameworks. Standardization issues, limited clinical trials, and lack of regulatory acceptance hinder its global recognition. Nevertheless, it holds immense potential as a natural lipid-based drug delivery system in chronic and lifestyle-related diseases.

Bridging Ayurvedic wisdom with contemporary pharmaceuticals, especially through nanomedicine and lipidomics, may redefine Sneha Kalpana as a future-ready therapeutic modality. Its integration into integrative medicine could provide safe, effective, and sustainable healthcare solutions.

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