International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 4 April 2023, pp: 1144-1147 www.ijaem.net ISSN: 2395-5252

Bhavana a Potentiating tool to Enhance Drug Potency and Role in Drug Discovery

Ruchi Sharma[1], Rohit Sharma[1]

1. *Department of Rasa Shastra and BhaishajyaKalpana, Faculty of Ayurveda, Institute of Medical Sciences, BHU, Varanasi, Uttar Pradesh 221005, India,*

Date of Submission: 12-04-2023 Date of Acceptance: 22-04-2023

ABSTRACT
Bhavna is the process of levigating or wet grinding a single or combination of medications in a liquid media, such as juice, decoction, or solution of plant, animal, or mineral origin. Modifying the potency (Gunantara), adding new properties (Gunadhana), enhancing (Gunotkarsha), or deleting or reducing the amount of properties (Gunahani) can all be used to modify the quality/potency (Guna) level. Therefore, we shall review and talk about the Bhavana method of potentiating drugs, herbs, and formulations in this study. The results of this study will aid in understanding Bhavana's mechanistic function in the production of novel medications and drug discovery. Numerous investigations came to the conclusion that Bhavana is an Ayurvedic concept for making medications extremely strong. The particle size will be reduced, the phytoconstituents will change, and the nutritional value of medications will rise. There are still not enough credible scientific studies, though. So, there should be more scientific research on standardising its phytoconstituents levels and other parameters as it has increased biological efficacy.
Keywords: Bhavana, wet grinding, particle size, Ayurveda, drug development

I. INTRODUCTION

The most frequent pharmacological procedure of Ayurveda known as Bhavnais a levigation or wet grinding of single or compound powdered drugs with liquid medium, i.e. juice/decoction/solution of plant, animal, or mineral origin. Samskara, another name for Bhavana, is the Sanskrit term for the transformation of a substance's inherent attributes that adds new characteristics or improves its quality. In plain English, the term "Bhavana" refers to the process of absorbing the virtues of liquid media into the substance known as "Bhavita" (drug material that has undergone the Bhavana process), which contains the virtues and action (Guna-Karma) of liquid media with powdered pharmaceuticals to be levigated [1,2].

As a result, it probably controls the quality/potency (Guna) level by altering the potency (Gunantara), adding new properties (Gunadhana), enhancing (Gunotkarsha), or removing or decreasing the number of properties (Gunahani) [3,4]. All logical sceptics are focused on comprehending this typical medicinal process of transformation in the current globalisation scenario. The ancient Indian sage Charaka promoted Bhavana by expressing herbal juice (Svarasa) or herbal decoction (Kwatha) of the same drug or drugs with similar properties in the context of describing the principles of pharmaceutics [5]. Its uses are explained as quicker, augmented action with potential reduction in the required therapeutic dose of the drug under process. Bhavana's significance in herbal and herbomineral drugs is highlighted using the Ayurveda literature as an authoritative search engine [6].

So, in this study, we will review and discuss the Bhavanamethod of potentiating drug/herb/formulation. This study will help understand the mechanistic role of Bhavanain drug discovery and new drugs development.

II. METHODOLOGY

A number of widely used databases, including SciFinder, Google Scholar, MEDLINE, EMBASE, Scopus, PubMed, and Science Direct, were utilised to retrieve published papers (up until April 2023). We looked for and extracted published literature relating to mechanistic role of Bhavanain drug potentiating using the keywords " Bhavana", "Ayurveda", "drug potentiating", "drug discovery", "therapeutic", and "mechanism of action". The language of searches was limited to English.

International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 4 April 2023, pp: 1144-1147 www.ijaem.net ISSN: 2395-5252

III. RESULT

Increase phytoconstituents concentrations

As analysis offers a fundamental understanding of changes in chemical composition, which are truly related to therapeutic actions, a task was started to examine the notion on an analytical level. As a well-known medication for hyperglycemia, Karavellaka (MomordicaCharantia Linn.) was used for this study. Six batches of one kilogramme each of M. Charantia powder were produced. Bhavana of M. Charantia juice was supplied to the remaining three batches while the first three batches were retained in powder form (KaravellakaChurna, KC). To determine the percentage of change, physico-chemical analysis and nutritional value were performed. All examined variables and nutritional value ranges were wider in BKC than KC. These findings suggest that Bhavana works in concert with the drug's chemical components to increase their concentration. The therapeutic dose might be decreased as concentration rises. Carbohydrate and total energy show the greatest difference. When compared to KC, BKC had a much higher proportion of carbohydrates and total calories [7].

Highest difference is detected in Carbohydrate and Total energy. In both the parameters BKC showed much more proportion of carbohydrate and total energy compared to KC. Nearly three times as much carbohydrate is present in KBC as compared to KC. This data unequivocally demonstrates the enhanced nutritional value of KBC, which is truly a result of Bhavana. A similar finding is made for the test medications' overall energy [7].

Bhavana of M. Charantia juice is essential for boosting the concentration of various ingredients in its powder form. Bhavana to that drug via its own juice can considerably boost the drug's therapeutic potential. The current investigation supports Ayurveda's assertion that using Bhavana can alter a drug's properties. The analytical profile of BKC indicates a need for additional clinical study to determine the dosage and extent of its anti-diabetic and other systemic disease actions [7].

For drug delivery

ShuddhaGandhakaby using Bhavana principle, makes the herbo-mineral preparation GandhakaRasayana using 11 herbal medicines eight times in succession. As a result, it served as a model drug, and four samples were created using various techniques and media. The physical and chemical variables were assessed. The impact of increasing Bhavana (lavigation) on medication particle size was investigated. The surface anatomy of the drug with and without Bhavana was also attempted to be distinguished utilising a highly advanced x-ray photo electron spectrometer (XPS) analysis. Overall, there was a striking difference between the samples that included Bhavana and those that did not[8].

Only C, H, and O peaks with sulphur particles in the core were seen at the surface when the surface anatomy of the GandhakaRasayanawas investigated. While the Bhavana surface was found to be even and uniform, it was not the same for the other sample, which included no Bhavana. Beyond this range, the structure could not be seen due to the XPS analyzer's limited penetration strength of 100A0. Therefore, it can be demonstrated by this research that GandhakaRasayana is a herbo-mineral compound with sulphur particle in the centre and overlapping of Bhavanadravya on it. Alternatively, it's possible that our Acharya used sulphur as a carrier for uniform distribution of the sulfur-containing minerals [9].

On Extractive value

The efficacy of a drug is due to its active principles and the concentration of active principles can be estimated by its extractive value. A study was done to observe the effect of BhavanaSamskaraon extractive values of Vibhitaki (Terminalia bellericaRoxb.). Here a drug sample is taken and given Bhavana (trituration) with plain water to observe changes in the extractive values. The sample of AbhavitaVibhitaki (un-triturated Terminalia bellericaRoxb.) Choorna and Bhavita (triturated) Vibhitaki (Terminalia bellericaRoxb.) Choorna was taken for extraction of both water soluble and alcohol soluble active principles in cold maceration method. Then the extractive values obtained were noted. The study found that BhavanaSamskara did not significantly affect the extractive values of the drug taken when triturate with plain water. But few studies should be conducted to validate this result by using other Bhavitdravya [10].

Biological action

A correlation between the analytical test results and the efficacy research has also been attempted. With the aid of FT-IR and HPTLC, TribhuvankeertiRas was standardised. Additionally, Swiss albino mice were used to test TribhuvankeertiRas' medicinal effectiveness. The HPTLC fingerprint profile shows that TulasiRas, AdrakRas, and DhaturaRas are all three of the bhavanadravyas. The outcome demonstrated that all of the Bhavanas in the TribhuvankeertiRas

International Journal of Advances in Engineering and Management (IJAEM)
Volume 5, Issue 4 April 2023, pp: 1144-1147 www.ijaem.net ISSN: 2395-5252

formulation had the same sameRf values as they did when they were alone, and FT-IR analysis supports a distinct transmittance peak in the range of 4000cm-1 to 600cm-1. The pharmacological outcome describes TribhuvankeertiRas' anti-pyretic efficacy in mice. In order to confirm the presence of bhavanadravyas in TribhuvankeertiRas, the HPTLC and FT-IR procedures were devised [11].

After Marana (incineration), BhavanaDravya's potential could be greatly diminished. A well-known Rasa Dravya utilised in Pandu Roga is Kasisa. A clinical study has been conducted to compare the efficacy of various treatments for PanduRoga. The study included 60 diagnosed cases with low haemoglobin levels between the ages of 6 and 15 in an open label comparative clinical investigation. Twenty patients from each of the groups A and B received treatment with BhirngarajaSwarasa and NimbuSwarasaBhavitaKasisa, respectively, while group C received a tablet of the common medication, ferrous sulphate. Results indicate that following therapy, there is a statistically significant difference (p=0.038) in the overall symptom score between the three groups. Group A experienced the greatest mean improvement in symptom score 3.55 (39.6% alleviation). It is 3.40 (31.91% reilef) in Group C. It is 3.40 (31.91% relief) in Group C and 2.30 (29.68% relief) in Group B. Group A, Group B, and Group C each have a mean Hb% change of 1.86 (19.89%), 1.74 (18.57%), and 1.44 (15.34%), respectively. BhringarajaSodithaKasisa has been shown to perform better than other groups when taking into account the improvement in Hb% and overall effect on symptoms.Herbal ingredients present in the SodhanaDravya play an important role in increasing the bioavailability of Iron. Based on the results of this research work it may be concluded that,we can select the SodhanaDravya depending on the disease condition [12].

Pharmacognostical and pharmaceutical evaluation

The four medications Chirabilva, Arjuna, Jyotishmati, and Kakanasa that make up ChirabilvadiYoga are combined in powder form, and each of these components has a strong experimental history supporting its distinct analgesic action that can be processed with Bhavana which is used to increase the potency of a medication so that it has a favourable effect. There is currently no information on the combination of BhavitaChirabilvadi Yoga and ChirabilvaPatraSwarasa, which were triturated seven times and then dried. Current study was conducted to compare the pharmacognostical and pharmacological profiles of Chirabilvadi Yoga before and after Bhavana. Significant pharmacognostical parameters, such as deformed rosette crystals, cluster crystals, and broken stone cells of Arjuna, which are infrequently found before Bhavana of the drug, were discovered after Bhavana. It was also determined that the pharmaceutical profile differed between the two periods in terms of loss on drying, ash value, acid insoluble ash, water soluble extract, methanol soluble extract, pH, and HPTLC [13].

In a study, 10 medications that are processed with Bhavana are combined to create ShwasaharaDashemani. After that, the pharmacological and pharmacognostical profiles of the ShwasaharaDashemaniChurna made with various Bhavana concentrations are compared. All of ShwasaharaDashemani's medications were consumed as a single mixture in the form of Churna made with one Bhavana and another with seven Bhavanas. The same medications that ShwasaharaDashemani utilised for Bhavana were used for the Kashaya. The Churna created with one Bhavana revealed simple starch grains of Shathi, stone cells of Agaru, etc. In the powder, whereas the Churna prepared with seven Bhavana revealed scleroids of Agaru with smashed walls and fibres of Amlavetasa with smoothened walls. The Churna prepared with one Bhavana had a higher loss during drying, whereas the Churna created with seven Bhavana had a higher ash value. There is a change in pharmcognostical properties following the Bhavana, hence the number of Bhavana plays a significant part in the medication production. With a smaller dose, these modifications favour improved absorption, assimilation, and target action [14].

IV. CONCLUSION AND FUTURE PROSPECTIVE

Many studies concluded that Bhavana is a Ayurvedic principle to highly potentiate the drugs. It will help reducing the particle size, change in phytoconstituents and increase the nutritive value of drugs. But still there are lack of proper scientific proofs. More organised and scientific studies should be conducted. As it shows increase in biological potency, so more scientific studies on standardizing it's phytoconstituents level should be conducted.

REFERENCE

[1]. Rohit Sharma, Prashant Bedarkar, Deepak Timalsina, Anand Chaudhary, Pradeep Kumar Prajapati, "Bhavana, an Ayurvedic Pharmaceutical Method and a Versatile

Drug Delivery Platform to Prepare Potentiated Micro-Nano-Sized Drugs: Core Concept and Its Current Relevance", Bioinorganic Chemistry and Applications, vol. 2022, Article ID 1685393, 15 pages, 2022. https://doi.org/10.1155/2022/1685393

[2]. R. Sharma, P. K. Prajapati, and P. Prajapati, "BhavanaLiquid media's in BhavanaSamskara: a pharmaceutico-therapeutic prospect," The Journal of Phytopharmacology, vol. 4, no. 1, pp. 49–57, 2015

[3]. R. Sharma and P. K. Prajapati, "Pharmaceutico-therapeutic vistas of kasisa (green vitriol) in Ayurveda," International Journal of Ayurveda and Pharma Research, vol. 2, no. 1, pp. 36–47, 2016.

[4]. S. Gupta, S. Mitra, and P. K. Prajapati, "Utility of samskara in pharmaceutics w.s.r to SandhanaKalpana," Indian Journal of Ancient Medicine and Yoga, vol. 2, pp. 229–234, 2009.

[5]. Y. T. Acharya, "Charakasamhita of agnivesha," Kalpasthana, ChaukhambhaOrientalia, Varanasi, India, 2004.

[6]. S. Ayyasamy and R. Sudha, "Chunnam: a commended dosage form in siddha medicine," International Journal of Research in Ayurveda and Pharmacy, vol. 4, no. 1, pp. 1–4, 2013.

[7]. Choudhari, M., & Rajput, D. S. (2020). Comparative analytical study on effect of Bhavana on KaravellakaChurna (Momordicacharantia Linn.) and BhavitaKaravellakaChurna. International Journal of Ayurvedic Medicine, 11(1), 113–119. https://doi.org/10.47552/ijam.v11i1.1381

[8]. ShuchiMitra, P. K. Prajapati,1 V. J. Shukla,2 and B. Ravishankar3Impact of BhavanaSamskara on physico-chemical parameters with special reference to GandhakaRasayana prepared by different media and methods. Ayu. 2010 Jul-Sep; 31(3): 382–386. Doi: 10.4103/0974-8520.77155.

[9]. Brochure CCCM. Bhabha Atomic research center. Hyderabad.2008.

[10]. J

[11]. Thakur et al. Confirmation and optimization of BhavanaVidhi in TribhuvankeertiRas – An Ayurvedic formulation. Journal of Pharmacognosy and Phytochemistry 2016; 5(6): 205-213.

[12]. Pooja et al. Impact of bhavanasamskara on therapeautic effect with special reference to kasisa purified by different bhavanadravyas and their effect in haemoglobin level- a comparative study. PIJAR/Volume-I/Issue –II/october-november-2016. 59.

[13]. Pooja Rohilla, R N Acharya, C.R. Harisha, Shukla V.J, &Anshul. (2022). Detailed Comparative Pharmacognostical and Physicochemical Evaluation of Chirabilvadiyogaw.s.r. to Bhavana (Trituration). International Journal of Ayurveda and Pharma Research, 10(9), 18-26. https://doi.org/10.47070/ijapr.v10i9.2509.

[14]. Neha R. Patel. Comparative study of pharmacognostical and pharmaceutical evaluation of shwasaharadashemanichurna with different numbers of Bhavana (Levigation). International Journal of Green Pharmacy. Oct-Dec 2016. 10 (4)/250.