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FUNDAMENTAL PRINCIPLE OF AYURVEDIC PHARMACEUTICALS

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ABSTRACT

Fundamental basic principles are crucial concepts to comprehend in any given field. Each scientific discipline possesses its own set of basic principles. Bhaishajya Kalpana, a branch within Ayurveda known as Ayurvedic pharmaceutics, also adheres to specific basic principles regarding pharmaceutical science (Aushadha Nirmana). The formulations derived from this branch have been utilized in various therapeutics (Aushadha Prayoga) for centuries. However, the basic principles associated with Bhaishaya Kalpana have not been clearly outlined and are dispersed. Therefore, an effort has been undertaken to systematically review and elucidate the fundamental basic principles of Bhaishajya Kalpana, emphasizing their significance. Consequently, the basic principles of Bhaishajya Kalpana are classified into the Principle of Formulation and the Principle of Therapeutic Application. A comprehensive understanding of these fundamentals serves as the key factor for successful research and development in Ayurvedic pharmaceutics.

INTRODUCTION

Throughout the ages, Ayurveda has bestowed humanity with profound guidance on the art of living and the science of health. Its objective is to delve into the very essence of a problem, addressing and eliminating the root cause through Ayurvedic therapies and medications (Bhaishajya). Ayurvedic drugs have a rich tradition of being meticulously prepared, whether as single or compound herbal/herbomineral formulations in various dosage forms.

Traditional formulations boast a wealth of phytochemicals—compounds derived from plants that exhibit proven biological actions in the animal body—each possessing distinct medicinal

properties. The therapeutic efficacy of these phytochemicals lies in their sophisticated and complex nature, determined by their chemical composition. Therefore, the meticulous preparation of herbal formulations containing these essential phytochemicals strictly adheres to the Basic principles of Bhaishajya Kalpana.

The Basic principles of Bhaishajya Kalpana, constituting Ayurvedic pharmaceutics, serve as the bedrock for crafting diverse basic single or polyherbal and herbo-mineral Ayurvedic formulations. They chart the course for unique management by employing meticulously prepared formulations. These basic principles form a common ground for various formulations and therapeutic applications, underscoring the need for a profound understanding of pharmaceutics concepts. This knowledge is essential for nurturing a cadre of skilled professionals capable of producing high-quality, efficacious formulations and ensuring their effective application.

FUNDAMENTAL: Basic Principel of Bhaishajya Kalpana

Bhaishajya Kalpana Adharbhuta Siddhanta can be called as fundamental principle of Aushadha Nirmana.[2] and Aushada Prayoga or Art of Aushadha Nirmana and Aushadha Prayoga. Main aim of Bhaishajya Kalpana is to develop the quality dosage forms of Ayurveda formulation in order to achieve utmost therapeutical benefits but without the knowledge of proper Bhaishajya Kalpana Adharbhuta Siddhanta stands as the cornerstone of Aushadha Nirmana, embodying the essential basic principles of both formulation and application in the realm of Ayurvedic medicine. It is the artful science of crafting and utilizing medicinal preparations, constituting a pivotal discipline in the creation and utilization of therapeutic formulations within Ayurveda.

The primary objective of Bhaishajya Kalpana is to elevate the quality of Ayurvedic dosage forms, ensuring the attainment of optimal therapeutic benefits. However, the realization of these benefits hinges on a profound understanding of the proper application of these formulations. Mere formulation is insufficient; a comprehensive grasp of application basic principles is imperative for the desired therapeutic effects to manifest.

Thus, the basic principles of Bhaishajya Kalpana extend beyond the mere creation of formulations; they encompass the nuanced understanding of their application. In the broader context of pharmaceutical study, it is not limited to the manufacturing of drugs alone. Instead, it spans the entire continuum, encompassing the meticulous dispensing of medications to

patients in the most suitable forms, culminating in their adept application by individuals seeking healing.

Thus, the comprehensive fundamental basic principles of Bhaishajya Kalpana are classified into following

A. Basic principles for formulation (Aushadha nirmana siddhanta)
B. Basic principles for therapeutic application (Aushadha prayoga siddhanta)
C. Principle for the formulations

Paribhasha Siddhanta (terminology)

Before delving into the intricacies of pharmaceutics, one must first master the profound knowledge embedded within the Shastra and the intricacies of the terminologies encapsulated therein. In the vast expanse of Ayurvedic literature, one encounters technical terms that, more often than not, lack precise elucidation. Some terms find no mention at all, while others are presented in a succinct or cryptic manner, leaving room for ambiguity. To dispel these uncertainties, there arises the need for Paribhasha—a meticulous and comprehensive clarification of these terms and statements.

Paribhasha serves as the beacon of understanding, shedding light on the intricacies of drug descriptions, manufacturing processes, and the precise quantification of ingredients outlined in classical texts. It functions as the key to unraveling the obscured meanings within the context of classical statements, thus ensuring a lucid comprehension of the profound wisdom encapsulated in Ayurvedic literature.

Avyakta (hidden concepts)

Certain technical terms demand careful deciphering to ensure a thorough comprehension. For example, the term "triphala" denotes not the names of the fruits but specifically refers to a combination of three fruits, namely Amalaki, Haritaki, and Bibhitaki. This is just one instance among many, where terms require complete elucidation for a comprehensive understanding.[3]

Anukta (unspoken concepts)

In instances where the shastra does not stipulate a specific time for administering medicine or gathering herbs, it is advised to do so in the morning, as outlined in the Sharangdhara Samhita. Similarly, when there is no specified dosage for Arishta Dravya, Acharya Sharangdhara recommends a general guideline: "Anukta manarishtesu dravdrone tulam

gudam|ksodram kshipedgudadardham prakshepam dashamanshikam|," suggesting the proportional use of ingredients in the absence of specific measurements.[4,5]

Leshokta (less explained/concise)

Swarnadi lohapatranam suddhiresham prashasyate (rasa ratna sam.5/29)[6] here swarnadi is in concised form, indicates collectively the metals of lauha varga i.e swarna, rajat, tamra, lauha, naag, vang,pittal kamsya.and varta lauha.[6]

Sandigdha (doubt/vague)

When a shloka redundantly mentions an ingredient without specifying its quantity in the formulation, it is advisable to interpret it by attributing the amount of the same drug as being two-fold, following the Punarukta dravya mana siddhanta articulated in the Sharangdhara Samhita. By grasping these terminologies through the aid of Paribhasha, a clearer understanding of the basic principles of Ayurvedic pharmaceutics can be attained.

Basic Principles of Mana (weight and measurement)

A profound understanding of mana is indispensable for the efficacy of pharmaceutics and therapeutics. Mana holds a pivotal role in the manufacturing and dosing of medicines. In the formulation process, specific mana is stipulated for each drug, particularly when incorporating visha dravya (poisonous substances). The absence of proper ratios of ingredients, not elucidated in classical texts, can impede the effectiveness of a medicine, potentially leading to toxic effects. In therapeutic applications, administering a low dose renders the medicine ineffective, while an excessive dose may result in adverse effects. Thus, mana emerges as a critical factor in both formulating medicines and managing diseases.

Panchvidha kashaya kalpana: The basic Five Dosages form

Acharya Charak delineated the five fundamental formulations known as Panchvidhakashaya Kalpana, comprising swarasa (juice), kalka (paste), kwath (decoction), hima (cold infusion), and phanta (hot infusion).[13] These foundational preparations serve as the backbone of Ayurvedic formulation, establishing the groundwork for secondary preparations.[14] The potency of medicines in the primary category surpasses that of the subsequent ones,[15] underscoring the need to prescribe them with careful consideration of the patient's strength and the severity of the ailment.

The determination of basic dosage forms is rooted in the panchmahabhuta, with dravyas dominated by apa mahabhuta proving more effective in cold infusions (Hima kalpana). Conversely, dravyas dominated by agni mahabhuta exhibit greater efficacy in hot infusions (phanta kalpana).

Anukta visheshokta grahan siddhanta

When the shastra does not specify a particular time for taking medicine or collecting herbs, it is recommended to do so in the morning. In cases where the specific plant part is not mentioned, the root of the plant is to be utilized. If the proportion of different ingredients in a recipe is unspecified, all ingredients should be taken in equal quantity. In instances where the type of patra (vessel) is not specified, a clay pot is to be employed. If the liquid to be used is not specified, water is the default choice, and if the variety of oil is unspecified, tila taila is to be used.[16]

In formulations like churna, ghrita, asava, or avleha, if the type of chandana (sandalwood) is not specified, sweta chandan is recommended. Conversely, for kashaya or lepa formulations, rakta chandan should be used. According to the Vishesh Siddhanta, specific ingredients such as panchkol, pippali, pippali-mula, chavya, chitrak, and saunth are used in amounts of 1 koal for each dravya.

This approach aids in making informed decisions regarding words not explicitly specified in classical texts. Therefore, this siddhanta is crucial for comprehending terms left undescribed or unspecified.[17]

Basic principles of collecting raw drug Identifying - Selection - Storage Preservation

The initial step in preparing medicines involves the accurate identification of raw materials. In both Samhita and Nighantus, various synonyms are provided for drugs, offering valuable insights for their identification. Take, for example, Pippali (Piper longum Linn), which boasts numerous synonyms. Magadhi denotes its place of abundant growth, specifically Magadha; Krishna describes its external color, indicating black; Kana details the external texture, highlighting a beaded appearance; Usana attributes its pungent taste; Upkuliya is utilized for ecological description; and Koala signifies its fruit, weighing about 1 Koal (6gm).[18]

Samgrahan (Collection)

The efficacy of Ayurvedic drugs is contingent upon their inherent properties, a quality shaped by the methods of collection and processing. Elements such as soil type, agro-climatic conditions, and nakshatras play a significant role in influencing the intrinsic properties of these drugs.

In ancient times, it was recommended to gather medicinal plants facing the East (symbolizing vitalizing plant energy through the sun) or the North direction (associated with the moon). This practice was advised during specific auspicious nakshatras, namely pushya, mrigshira, hastha, and ashwini, as mentioned in classical texts due to their perceived superiority.[20] Consideration of the optimal time for collection is paramount, aligning with when the active ingredients are at their peak and free from decomposition. For instance, the latex of plants should be collected before sunrise or when it naturally oozes out.[21]

Time of collection

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The collection of milky juice from snuhi (milk hedge) is recommended after two or three years of growth,[22] Bilva fruits, on the other hand, are best gathered just before their dehiscence,[23] while tamarind should be collected at its full maturity,[24] These time-specific practices aim to ensure the potency and effectiveness of the gathered substances.

Collection of drugs

Land Characteristics for Drug Cultivation: Optimal drugs should be sourced from well-suited land. The distinctive features of the land and region where herbs are harvested are elaborated in classical texts.[25,26]

Herb Characteristics: The specific features of herbs to be collected are outlined in Sushruta Samhita.[27]

Collection According to Therapeutic Action: According to Acharya Susruta, virechan dravya (purgatives) should be gathered from prithvi and jala guna bhuyishta bhumi, vaman dravya (emetics) from agni, akash, vayu guna bhuyishta bhumi, and samshaman dravya (palliatives) from akash guna bhuyishta bhumi.[28] In contrast, Acharya Sharangdhara suggests collection based on therapeutic action with regards to the season, stating that vaman and virechan actions require collection at the end of the vasant ritu, while other actions should be undertaken during the sharad ritu.[29]

Collection According to Potency: Drugs with usna virya (hot potency) should be collected from agneya bhumi during grishma ritu, whereas shita virya (cool potency) drugs should be gathered from soumya bhumi during shita ritu.[30] Additionally, drug collection based on potency with respect to specific regions is emphasized—usna and tikshna dravya from the vindhyanchal region and shita prabhav dravya from the Himalayan region.[31]

Selection criteria of dravya (Dravya chayan siddhanta)

Selection of Plant Parts and Seasonal Considerations: The efficacy of active ingredients in specific plant parts reaches its peak during particular seasons, necessitating careful selection of the corresponding plant part. For instance, the flowers of the Dhataki plant, the latex (kshir) of the Snuhi plant, and the steam core (sara) of the Bijak and Khadir plants are recommended for use.[32] Various Acharyas offer differing perspectives on the selection of plant parts and the associated seasons. Acharya Charaka, for example, suggests the collection of bark (twak), core wood (kanda), and latex (kshir) during the sarad ritu, whereas Acharya Sushruta advocates for the collection of only bark during this season.[33,34] Rajnighantu recommends the selection of the entire plant (Panchang) during this time.[35]

Navin and prachin dravya grahan (New and Old Herbs)

As a rule, drugs are ideally chosen when they are fresh, with the exception of certain substances like Vidanga (Embelia ribes), Krishna (Piper longum), Guda (jaggery), Dhanya (cereals and pulses), Ajya (ghee), and Makshika (honey).[36] It's noteworthy that the potency of these specific drugs actually intensifies over time.

Dry and wet dravya siddhanta

Nevertheless, the standard practice is to utilize a dried drug only when freshly collected and dried, whereas wet drugs are to be incorporated in double the prescribed quantity in all formulations.[37] unless specified otherwise. An exception to this rule is observed in the

utilization of wet drugs, where the general guideline is to use double the quantity; however, certain exceptions apply. These exceptions include guduchi, kutaj, vasa, kushmanda, shatavari, ashwagandha, sahachari, and shatpushpa.[38]

Abhava Pratinidhi dravya (drug substitution)

A substitute drug serves as an alternative in the absence of the original drug, effectively addressing the challenge of unavailability in medicinal formulations. The concept of pratinidhi dravya involves the intentional and rational selection of substitutes to achieve the desired therapeutic effect. Ayurvedic basic principles guide this substitution, emphasizing the similarity in guna (properties) and pharmacotherapeutic actions between the original and substitute drugs.

For instance, astavarga dravya can be substituted with vidarikanda, shatavari, ashwagandha, and varahi kanda. Some instances showcase not only similar morphological features but also comparable chemical constitutions, such as kushta (Saussurea lappa) serving as a substitute for pushkarmool.[39] However, there are cases where substitutes exhibit neither morphological nor chemical similarities with the original drug, as seen in the example of the wood of raktachandan and the root of ushir.

In contemporary times, the assessment of drugs is based on their gunakarma, and their therapeutic efficacy is further evaluated through analytical and clinical studies.[40]

Storage of raw materials: Area and Sections

Ensuring the safety, efficacy, and quality of raw materials stands as a paramount concern in Ayurvedic pharmaceutics. Achieving this goal involves meticulous regulation of the storage and handling of raw herbs for various Ayurvedic formulations. In ancient times, Acharyas were notably attentive to proper storage practices, aiming to shield raw materials from contaminants and preserve their ideal quality for formulations. As per Sushruta Samhita 38/82,[41] the storage house (bheshajgraha) should be devoid of dust and moisture, and raw materials should be stored in appropriate containers.

In contemporary times, stringent rules and regulations, outlined in the Good Manufacturing Practices (GMP) for Ayurvedic, Siddha, and Unani (ASU) drugs in Schedule T of the Drugs and Cosmetics Act of 1940, along with Rule 1945,[42] govern the storage of raw materials and finished products. Storage spaces for raw materials must be free from cobwebs, insects, and

rodents, maintaining hygienic conditions with ample provision for light, ventilation, and independence of space for raw materials, packaging materials, and finished products. Raw materials require suitable containers to preserve their quality, protecting them from damage, dampness, and contamination. Proper enclosures, such as pots, jars, cartons, etc., are employed for the separate storage of raw materials of metallic origins, minerals, animal sources, fresh herbs, dry herbs, volatile oils, perfumes, flavors, and plant extracts or resins, all maintained under hygienic conditions.

Samskara

The concept of Samskara is a pivotal element in ancient ideology, defined by Acharya Charaka as the transformation of inherent attributes within a substance, leading to the acquisition of new properties.[43] Generally, the guna karma (qualities and actions) of any dravya (substance) relies on the conjugation and configuration of the mahabhutas (basic elements) present within it. Samskara induces modification through alterations in the composition of panchmahabhutas, contributing to the addition of new properties and the removal of impurities and toxicity, as expressed in the aphorism "Gunadhanam doshapariharo va Sanskarah."

Various samskaras, including dilution, application of heat, cleansing, churning, storing in specific places, maturing, flavoring, and impregnation, can give rise to new dravyas with distinct guna-karmas. Examples include Toya sannikarsh, where Jala mahabhuta penetrates the parthiv dravya, loosening molecular bonding and softening hardness, enabling the active principle to dissolve in water (e.g., chincha panak, dhanyak hima). Agni sannikarsha involves converting guru dravya into laghu dravya through the application of heat. Shouch or shodhan (purification) processes, such as in shatdhaut ghrita or guggulu shodhana in Triphala Kwath, not only remove physical and chemical impurities but also enhance the properties of the substances involved.

Manthan (churning) is another transformative process, as seen in examples like "शोथकृत्दधि शोथघ्न सस्नेहमपि मन्थानात्",[45] where churning changes the property of the substance. Desh refers to collecting drugs from specific locations, considering factors like kesar in Kashmir or pippali in M.P, and the placement of patra. Kaal (duration and the effect of season and time) indicates that the timing of collection impacts the potency of the substance.

Vasan (flavouring) involves imparting fragrance to the finished product using Vasana samskara, which increases therapeutic efficacy due to its volatile content (e.g., kesar, kasturi, lavanga in avaleha and paka). Bhavana aims to increase the potency of a formulation by impregnating ingredients with the juice or decoction of other drugs. Proper impregnation enhances the effectiveness of even small quantities of the drug. Kaal prakarshopkram (maturation) directs the collection of certain drugs when completely matured, as their potency increases with time (e.g., asava, dhatu, ras). Bhajanopkram involves placing dadhi and ghrita in tamra patra to achieve specific effects in formulations.

Designs of formulation (Yoga Nirmana) andNomenclature (namakaran)

Ayurveda comprehensively considers the aspects of drug action, interaction, synergism, and antagonism in formulating various yogas to ensure safety and acceptability. The preparation of an ideal formulation encompasses four fundamental components: (i) pramukh aushadha (activator), (ii) sahayak aushadha (potentiator), (iii) updrav, doshnashak prabhav dravya (antidote), and (iv) bioavailability enhancer. Additionally, it may include considerations for (v) dravya for palatability, (vi) dravya for stability, and (vii) dravya for faster action.

For example, in Triphala Guggulu,[46] where guggulu serves as the main ingredient (activator) with therapeutic actions such as shothagna and vedanasthapana, triphala (potentiator) enhances the formulation's activity through its vranashodhana and vedanasthapana properties. It also counteracts side effects like constipation with its mild laxative action and burning sensation in the eyes with its chakshusya action. Pippali acts as a bioavailability enhancer due to its deepana pachana action and yogavahi guna.

In Navayas lauha,[47] composed of triphala, trikatu, trimad, and lauha bhasma, Lauha bhasma is the main ingredient for treating pandu. Triphala aids in the absorption of loha bhasma due to its acidic media and counters side effects like constipation, acting as a purgative. Trikatu churna increases appetite and improves digestion, addressing the lack in Pandu. Madhu and ghrita serve as anupana for navayasa lauha, facilitating fast action and enhancing palatability due to their yogavahi guna.

Nomenclature plays a crucial role in the identification, distribution, verification, and authentication of finished products. In Ayurveda, nomenclature is based on drug names, such as hinguleshwar ras, rogaghna - pramehantak vati, nirmata - nagarjuna ras, agustya haritki. However, it is essential to recognize that some formulations may share similar names but

contain different ingredients. Therefore, understanding both the name and ingredients, along with their indications, is imperative. In the context of patent medicines, adherence to the guidelines of proprietary medicines is crucial for accurate identification and verification.

Churna Kalpana

In Ayurveda, coarse powder is utilized for decoction, while fine powder (80 mesh size) is employed for churna and vati formulations. The finer the particle, the higher the absorption and bioavailability of Ayurvedic drugs.[48]

Asava-Arishta Kalpana: Several factors influence this preparation, including the type of containers (paatra). In ancient times, earthen pots were considered, but contemporary practices often favor porcelain pots or stainless steel due to the limitations of earthen pots. Optimum temperature (agni) and duration (kaal) are also key considerations.[49]

Sneha Kalpana: Before processing a medicinal drug with any sneha (oil or fat), it must undergo the murcchana process. This step is crucial to ensuring that therapeutic properties are fully imparted to the sneha. Murcchana removes disagreeable smells, eliminates ama dosha (toxic residues), and enhances the potency of the sneha.[50]

Aushadh Siddhi Lakshana: Observing signs of a siddha aushadha (finished product) marks the critical final stage of manufacturing. Altering the dosage forms becomes challenging after this stage. Thus, understanding proper aushadha siddhi lakshana is an essential aspect of Ayurvedic pharmaceutics. Nowadays, in addition to classical parameters, the quality of dosage forms is evaluated through analytical studies, ensuring compatibility with organoleptic characteristics and various modern analytical parameters.

Classical parameters for different dosage forms are outlined below

Sneha Kalpana: The completion of sneha paka is confirmed through indicators such as (i) vartivat snehakalaka, (ii) syat angulyavimardita, (iii) shabdino agnikshipta, (iv) gandavarna rasottpatti, (v) yada fenodhgamastaile fenshantishcha sarpishi, (vi) in mridu sneha paka - "ishat saras kalka" syu snehapaka mridu bhavet, (vii) in madhyam paka "kalke niras komal," (viii) in khara paka "ishat katin kalkashcha."[51]

Avaleha Kalpana: Criteria for determining the completion of avaleha paka include (i) supakwe tantumatvam syat, (ii) avleho apsu majjati, (iii) sthiratvam pidite mudra, (iv) gandh varna rasodhbhav.[53]

Asava-Arishta: The completion of the fermentation process is confirmed by criteria such as (i) when prakshep dravya completely sinks, (ii) no sound is heard, (iii) no effervescence is present, (iv) the burning candle continues to burn near the fermenting media due to the absence of carbon dioxide, and (v) lime water test shows no change. Nowadays, organoleptic tests and physico-phytochemical tests are also employed for consistent results.[54]

Vati Kalpana (Tablet): The final stage of vati preparation is determined by ensuring that the formulation does not stick to the fingers when rolled between them. Modern parameters for evaluating the standard quality of vati formulations include hardness, disintegration time, dissolution time, water-soluble extract, and alcohol-soluble extract.[55]

Packaging and Packing material

The process of packing drugs is regarded as both an art and a science, encompassing the manufacturing of articles for transportation, storage, display, and therapeutic use. Despite the efficient and careful preparation of a drug, its effectiveness diminishes if not properly packed, leading to contamination from extraneous substances and susceptibility to atmospheric changes. Inadequate packaging accelerates product degradation. In Ayurveda, specifically while describing karana samskara, Charaka emphasizes bhajana as a crucial aspect of material storage.[56] Sushruta Samhita advises storing products in tightly wrapped cloth treated with disinfectant materials made from wood or mud.[57] Packaging components may include containers, closures, and cartons. Various shapes and sizes of containers, made from different materials, are employed to pack different types of formulations.

Storage of Finished Products

The proper storage of medicine is essential to prevent spoilage, and specific qualities for the room where finished products are kept are outlined. The room should have an entrance facing East or North, ensuring free aeration, ventilation, and the frequent conduct of gandha, dhupa, and balikarmas.[58] According to Schedule T in the GMP of Drugs and Cosmetic Rule 1945, separate spaces for finished products are specified. Finished goods, once properly packaged, are transferred from the production area to the finished goods stores within a designated 'Quarantine' area. After confirming the accuracy of finished goods in terms of packing, labeling, and adherence to prescribed quality standards, they are then moved to the 'Approved Finished Good Stock Area.'"

Shelf Life of each Drug or Dasages Form (Saviryata Avadhi)

Ayurvedic medicines, primarily composed of herbs, are prone to losing their medicinal qualities over time. It is crucial to understand the shelf life of raw materials before processing and the shelf life of finished products to eliminate the use of expired drugs. Shelf life is a significant factor in dosing, storing, and dispensing medicines. The preservation and storage of Ayurvedic drugs are determined by their shelf life. Various Saviryata Avadhi for different Ayurvedic dosage forms are mentioned in classical texts such as Sharangdhara Samhita.[59] and Vangsen.[60] In Yogaratnakara, the shelf life for swaras, kalka, and kwath is explicitly mentioned as 3 hours.[61] In the current scenario, Rule 161 B of the Drug and Cosmetic Act 1940 has been amended to specify the maximum shelf life of Ayurvedic Medicine. The main factors influencing shelf life include the origin of drugs, temperature, humidity, microbial contamination, dosage forms, and storage and packing conditions.[62]"

Therapeutic Dosage (Aushadha Maatra): The therapeutic efficacy of a drug is intricately tied to its dosage. Precision in determining the dose is crucial; excessive amounts may lead to adverse effects, while insufficient doses may render the treatment ineffective. Thus, the dosage should be carefully regulated to ensure the drug achieves the desired therapeutic effects without causing harm to the tissues.

Route of Administration (Aushadha Marga): Drugs can be administered through various channels, including the skin, mouth, eyes, ears, nose, anus, urethra, and vagina, depending on the disease and dosha. Direct absorption and swift action are achieved by selecting nearby sites for administration, as seen in the example of basti.

Timing of Administration (Aushadha Sevan Kaal): The timing of drug administration significantly influences absorption. For instance, administering drugs on an empty stomach (abhakta)[63] maximizes their impact, as the full extent of the stomach and intestines is available for effective drug absorption. In abhakta kala, the Veerya Shakti of the Aushadha remains relatively unchanged since it does not mix with food. This timing factor affects the pharmacokinetics and pharmacodynamics of Ayurvedic medicines, depending on Agni, the presence or absence of food, and the available surface area.

Adjuvants (Anupan): According to Acharya Sharangdhara, the use of anupana is likened to the swift dispersion of an oil drop added to water.[65] This analogy suggests that when medicines are administered with anupana, they rapidly spread due to the yogavahi and

vyavayi properties present. Anupana not only quickens absorption but also enhances the potency of the medicine, facilitating the desired therapeutic effects. It further improves digestion and absorption capacity.[66]"

CONCLUSION

"Ayurveda establishes standardized parameters for the manufacturing of optimal medicines based on its fundamental basic principles. The adherence to these basic principles is imperative for the successful formulation of efficacious medicines. To systematize these basic principles, an effort has been made to consolidate them into two groups: Aushadha Nirmana Siddhanta and Aushadha Prayoga Siddhanta. These branches encompass a total of eighteen essential basic principles, critical for ensuring productivity, quality, and efficacy.

Among these eighteen basic principles, seven hold cardinal significance and can collectively be referred to as samanya or general basic principles. The remaining basic principles pertain to the formulation process, spanning from the collection of raw materials to processing, packaging, and determining the shelf life of the finished products. Additionally, a comprehensive understanding of the proper utilization of aushadha, including aushadha matra (therapeutic dosage), aushadha kaal (timing of administration), aushadha marga (route of administration), and anupana (adjuvants), is crucial. These elements contribute to enhancing the efficacy of medicines and facilitating their rapid absorption."

SUMMARY

This comprehensive review systematically delves into the foundational basic principles of Bhaishajya Kalpana. To enhance understanding, these fundamental basic principles are systematically categorized into two primary groups: basic principles of formulation, which focus on the preparation of medicines, and basic principles of therapeutic application, pertinent to clinical implications. Within the formulation basic principles, additional distinctions are drawn among general basic principles (paribhasha, maana, panchmahabhoota, ras-guna-viryya-vipaka), basic principles of raw drugs, basic principles of different dosage forms, shelf life, packaging, and storage.

Similarly, therapeutic basic principles involve considerations such as dose, route of administration, time of administration, and adjuvants. This systematic classification is designed to structure the diverse basic principles in a cohesive manner, enhancing accessibility and comprehensibility for readers."

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