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RESEARCH ARTICLE

PHARMACODYNAMICS OF NAVAYAS CHURNA: A DETAILED EXPLORATION OF ITS THERAPEUTIC MECHANISMS AND APPLICATIONS

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Abstract

Background: Ayurveda is one of the oldest branches of knowledge an d a system of philosophical principles.Ayurvedic practitioners have effe ctively used numerous classical formulations to treat a wide range of ail ments.In many cases, detailed information about their mechanisms of a ction is still lacking. NavayasChurna is one of them. It is a herbo metall ic preparation(Rasaushadhi)commonly used by Ayurvedic practitioners .According to the World Health Organization,Ayurvedic medicines fall under the category of traditional medicine.These medicines are used for the prevention of illness, diagnosis, treatment and promotion of health. Understanding the pharmacodynamics of Ayurvedic drugs is essential for the scientific validation of their traditional uses. It helps to explain ow these formulations interact with the body and ensure safety by predi cting potential side effects.This knowledge also aids in optimizing form ulations,guiding evidence based drug development, and meeting global regulatory standards.Especially for complex preparations, such as herb-metallic compounds,pharmacodynamic insights are crucial for integrati ng Ayurveda into modern healthcare.The preset study aims to compile t he available literature regarding the pharmacodynamics,therapeutic mechanism,actions and properties of the NavayasChurna.

Introduction: -

Ayurveda, the traditional medical science of India, not only focuses on diagnosing and treating diseases but also emphasizes maintaining health through proper lifestyle practices. Its holistic approach aims at both curing ailments and promoting long-term wellness. Ayurvedic practitioners are empowered to choose the most appropriate therapeutic methods to achieve these goals. According to the World Health Organization, approximately 70% of the population in developing countries relies on herbal or traditional medicine for their primary healthcare needs [1]. Traditional systems like Ayurveda are also gaining popularity in developed nations. In India, Ayurveda has been practiced since the Vedic period, with a wide variety of formulations that are considered safe, effective and associated with fewer side effects [2][3]

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Ancient Ayurvedic scholars emphasized that a physician's success largely depends on their in-depth knowledge of medicinal substances. Ayurveda advocates the use of both plant and mineral-based remedies for managing various health conditions [4]. The pharmacodynamics of Ayurvedic drugs is crucial for explaining how they act at the molecular, cellular and systemic levels, impacting key physiological processes such as metabolism, immune function and blood formation.

Pharmacodynamic insights play a vital role in developing evidence-based Ayurvedic or integrative formulations, especially for managing chronic and lifestyle-related diseases. The action of a drug in the body is believed to be governed by the five fundamental principles known as Rasa Panchaka - namely Rasa, Guna, Virya, Vipaka and Prabhava. These factors, individually or collectively, influence the body by balancing the Doshas, correcting DathuPradooshana and supporting overall health, Swasthahitha.

NavayasChurna is a classical Ayurvedic herbo-mineral formulation, traditionally used for its potent therapeutic properties. The name itself holds significance - Nava refers to the nine ingredients used in its composition, while Ayas denotes iron, indicating the inclusion of processed iron in the form of Loha Bhasma. This formulation combines nine medicinal herbs with Loha bhasma, creating a synergistic blend that enhances its efficacy in treating a wide range of disorders. NavayasChurna is primarily indicated in the management of Pandu (Anemia) due to its hematinic and blood-purifying properties. In addition, it is widely used in treating Hridroga, Bhagandara, Shotha, Kustha, Udara, Arsha, Mandagni, Aruchi and Krimi Roga. This formulation is described in detail by Acharya Sharangadhara in the Churna Kalpana Adhyaya of the Sharangadhara Samhita, an authoritative classical text on Ayurvedic pharmaceutics. The unique combination of herbs and mineral components in NavayasChurna reflects the traditional principle of combining ingredients to enhance both efficacy and safety of formulation. [5]

Aim and Objectives: -

AIM

To review the pharmacodynamics, therapeutic mechanism and applications of NavayasChurna.

Objectives:-

The objective of this study is to review the therapeutic actions of NavayasChurna by examining the individual functions of its ingredients and exploring their pharmacodynamic properties. This analysis aims to provide a deeper understanding of how the combined components work synergistically to exert their medicinal effects, thereby supporting the formulation's traditional uses and guiding future research.

Materials and Methods: -

Literary resources, including classical texts and contemporary studies, have been studied extensively. All relevant information available from both traditional literature and online sources has been gathered and thoroughly analyzed to facilitate a comprehensive and conclusive discussion.

Sr No	Ingredient	Botanical Name	Family	Quantity
1	Chitrak	Plumbago zeylanica	Plumbaginaceae	1 part
2	Haritaki	Terminalia chebula	Combretaceae	1 part
3	Amalaki	Embelica officinalis	Euphorbiaceae	1 part
4	Bibhitak	Terminalia bellerica	Combretaceae	1 part
5	Musta	Cyperus rotundus	Cyperaceae	1 part
6	Vidanga	Embeliaribes	Myrsinaceae	1 part
7	Shunthi	Zingiber officinale	Zingiberaceae	1 part
8	Maricha	Piper nigrum Linn.	Piperaceae	1 part
9	Pippali	Piper longum Linn.	Piperaceae	1 part
10	Loha Bhasma	-	-	9 parts

Table 1: Ingredients of NavayasChurna

Method of preparation of NavayasChurna

- All the herbal ingredients listed in Table 1 were thoroughly cleaned to remove any foreign materials.
- Individually powdered until they pass through a 100 no. Mesh sieve.
- The required quantities of each powdered herb were accurately weighed.

- All ingredients were mixed thoroughly to ensure a homogeneous blend.
- An equal amount of Lauha Bhasma was then added to this mixture.
- Trituration was carried out to get a homogeneous mixture.

Anupana – Madhu (honey), Ghrita (ghee), Gomutra, Takra (buttermilk)

Sr No	Ingredient	Rasa	Guna	Virya	Vipaka
1	Chitrak [6]	Katu	Laghu, Ruksha, Tikshna	Ushna	Katu
2	Haritaki[7]	LavanavarjitaPancharasa	Laghu, Ruksha	Ushna	Madhur
3	Amalaki[8]	LavanavarjitaPancharasa	Laghu, Ruksha, Shita	Shita	Madhur
4	Bibhitak[9]	Kashaya	Laghu, Ruksha	Ushna	Madhur
5	Musta [10]	Tikta, Katu, Kashaya	Laghu, Ruksha	Shita	Katu
6	Vidanga [11]	Katu, Kashaya	Laghu, Ruksha, Tikshna	Ushna	Katu
7	Shunthi[12]	Katu, Tikta	Ruksha, Laghu, Tikshna	Ushna	Katu
8	Maricha [13]	Katu, Tikta	Laghu, Tikshna	Ushna	Katu
9	Pippali[14]	Katu	Laghu, Snigdha, Tikshna	Anushna Shita	Madhur
10	Loha Bhasma [15]	Tikta, Madhur, Kashaya	Guru, Ruksha	Shita	Madhur

Table 2: Constituents of NavayasaChurnawith Rasa (Taste), Guna (Attribute), Virya (Potency), Vipaka (Internal biotransformation of drug)

Sr No	Ingredient	Doshaghnata	Karma
1	Chitrak	Kapha Vat Shamaka	Lekhan, Uttejaka, Deepan, Pachan, Saraka, Grahi, Rasayan, Krumighana, Shothahara, Kaphghana, Kanthya, Jwaraghana, Arshoghana,
2	Haritaki	Tridoshahar	Shothahara, Vedanasthapak, Vranropaka, Anulomaka, Mrudurechaka, Kushthaghana, Jwaraghana, Deepan, Pachan, Krumighana, Rasayan, Hrudya, Shothahara
3	Amalaki	Tridoshahar	Dahaprashamak, Chakshushya, Deepan, Anulomaka, Rochan, Hrudya, Shonisthapan, Jwaraghana, Kushthaghana, Rasayan, Aruchi, Shothaghana,
4	Bibhitak	Tridoshahar	Shothahara, Vedanasthapak, Deepak, Anulomaka, Krumighana, Arshoghana, Raktastambhaka, Jwaraghana
5	Musta	Kapha Pitta Shamak	Twachadoshahar, Shothahara, Lekhan, Deepan, Pachan, Medhya, Raktaprasadak, Mutrala, Balya, Vishaghana, Jwaraghana, Aruci, Ajirna, Krumighana,
6	Vidanga	Kapha Vat Shamak	Jantughana, Kushthaghana, Deepan, Pachan, Anulomak, Raktashodhak, Mutrajanana, Varnya, Rasayan, Balya
7	Shunthi	Kapha Vat Shamak	Shothahara, Vedanashamak, Deepan, Pachan, Rochan, Arshoghana, Shulaprashamana, Hrudya, Shothahara, Raktashodhaka, Jwaraghana,
8	Maricha	Vat Kapha Shamak	Lekhan, Balya, Deepan, Pachan, Krumighana, Kushtaghana, Ajirnahar, Hrudya, Jwaraghana
9	Pippali	Pittashamaka	Krumighana, Deepan, Pachan, Shulahara, Raktavardhaka, Kushtaghana, Rasayan, Jwaraghana, Hrudya, Paduhara
10	Loha Bhasma	Tridoshaghna	Rasayan, Vishaghana, Pandughana, Shulaghana, Krumighana, Kushthaghana, Shothaghana, Hrudya, Arshoghana,

Table 3: Ingredients of NavayasChurna with their Doshaghnata (Action on Dosha) and Karma (Functions)

Sr No	Ingredient	Therapeutic Action
1	Chitrak	anti-diabetic, wound healing, anti-carcinogenic activity, contraceptive effect, hepato-protective, anthelmintic, anti-microbial, anti-inflammatory. [16]
2	Haritaki	antimicrobial, hepatoprotective, anti-mutagenic, anti-inflammatory, antioxidant, anti-diabetic, anti-proliferative, radio-protective, cardio-protective [17]
3	Amalaki	immune-modulating, anti-diabetic, memory enhancement, antioxidant, anti-inflammatory, hepatoprotective [18]
4	Bibhitak	antioxidant, laxative, antidiabetic, analgesic, anti-helminthic, anti-pyritic properties, antiulcer, antifungal, antibacterial and anti-hypertensive [19]
5	Musta	stomachic, anthelminthic, emmenagogue, astringent, anti-inflammatory, antioxidant, antipyretic, galactagogue, carminative, antidiabetic, cytoprotective, antimutagenic and analgesic [20]
6	Vidanga	hepatoprotective, antidiabetic, anthelminthic, diuretic, laxative antioxidant, anti-bacterial [21]
7	Shunthi	anti-inflammatory, antimicrobial action, anti-oxidative effect, bronchodilator, antimicrobial action [22]
8	Maricha	antibacterial, anti-inflammatory, antifungal, hepatoprotective, antioxidant, anticancer, antimicrobial, antihypertensive, antiasthma, insecticidal, antithyroid, wound healing activities[23]
9	Pippali	antimicrobial, antiplatelet, antihyperlipidemic, analgesic, anticancer, antioxidant, antiamebic, hepatoprotective, anti-inflammatory, coronary vasodilation, bioavailability-enhancing, immunomodulatory, adulticidal, melanin-inhibiting, antidepressant, antifertility, antiobesity, larvicidal, radioprotective, cardioprotective, antifungal [24]
10	Loha Bhasma	anti-anemia, aphrodisiac, emmenagogue, stimulant, anti-bacterial, anti-inflammatory, antioxidant, astringent, hematogenic, anti-ageing, analgesic, antipyretic [25]

Table 4: Ingredients of NavayasChurna with their therapeutic actions

Analysis as per Guna

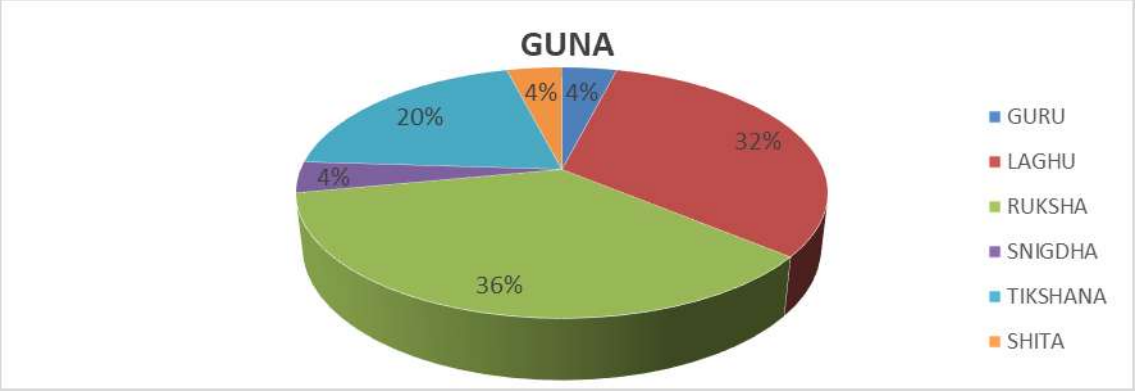
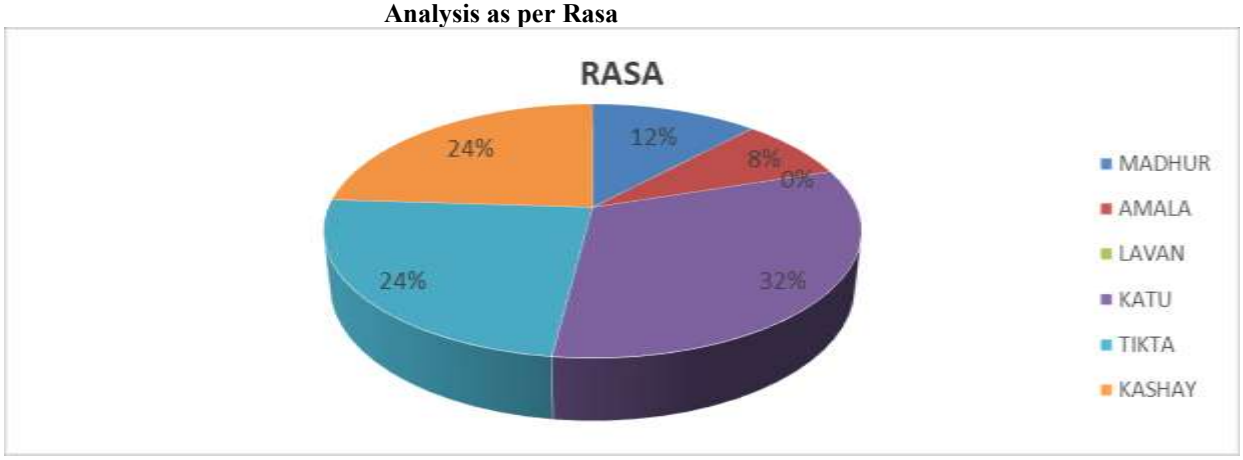


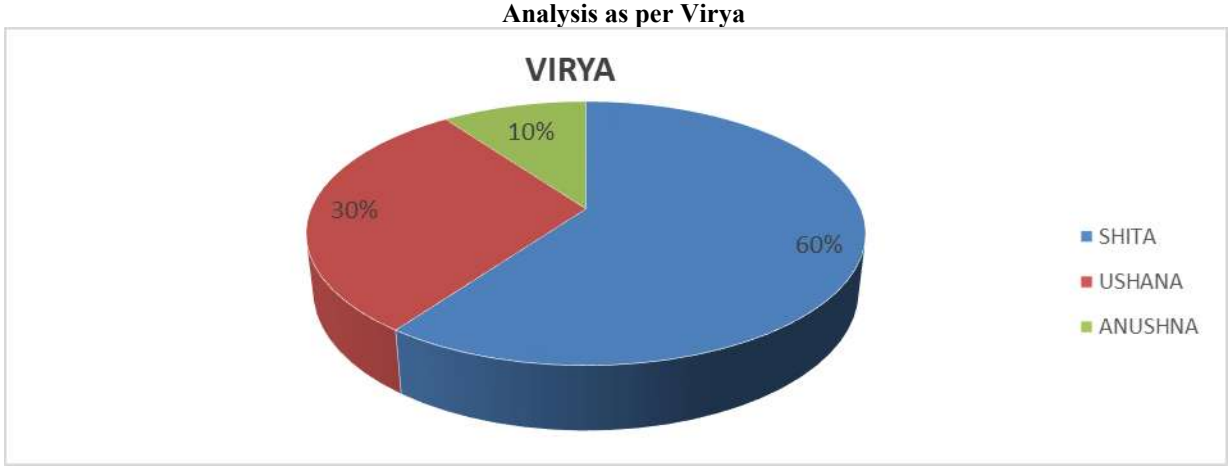
Table 2 indicates that Ruksha Guna dominates the composition with 36%, followed by Laghu Guna at 32% and Tikshana Guna at 20%. The remaining Gunas Guru, Snigdha and Shita each constitute 4% of the composition.
Ruksha is Kaphanashak, Shoshana,
Laghu is Laghavakaraka,Vranaropaka, Utsahavardhaka and Sphurtikar.
Tikshana is Shodhana, Lekhan Gunatamaka.
Guru is Brihana, Truptikar.
Snigdha is Kledana,Balya, Varnya and Snehamardavakar.
Shita is Stambhana, Murcha, Dah, Trushna and Swedanashaka.[26]

Analysis as per Rasa



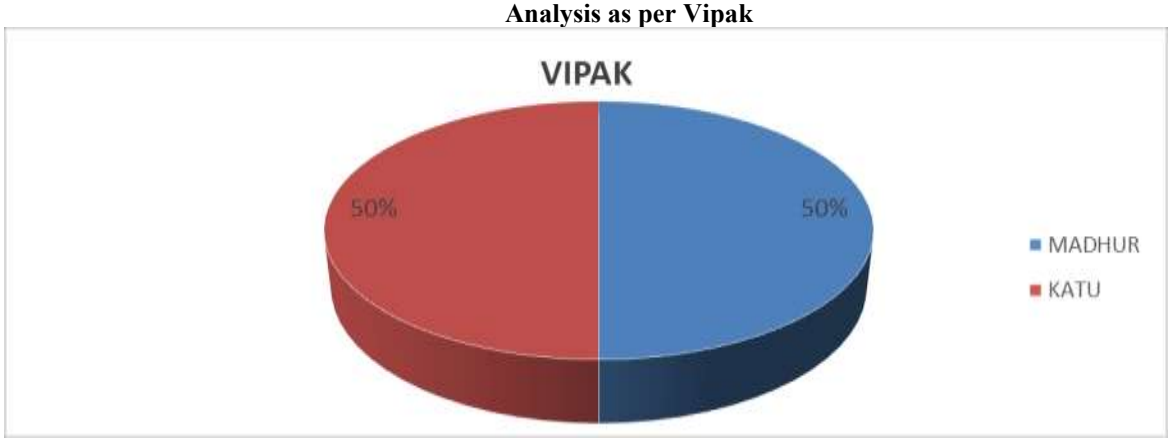
In NavayasChurna, the major Rasa is Katu, forming 32% of the composition.
Tikta and Kashaya each account for 24%, while
Madhur is 12% and Amla is 8%.
Lavana Rasa is entirely not present in its composition
According to Acharya Charak, KatuRasa has SrotasShodhana, Kandunashana and Vrana Avasadaka properties.
Kashaya Rasa is characterized by Sandhankar, Snashamaka and Sangrahi Gunas, along with actions like Sleshma, Pittaand Rakta Prashamaka.
Tikta Rasa shows Deepak, Pachaka, Lekhana, Mansaposhaka, Jwaraghana, Vishaghana, Krumighana and Kandughana effects.
Madhura Rasa is Saptadhatuposhaka, Indriya Prasadak, Balavarnakar, Ayushya Vardhaka and acts as Pitta, Visha, Trushna and Daha Prashamaka; it is Balya, Jivaniya andTarpaniya.
Together, these attributes aid in SamprаptiVighatan as indicated in the Phalshruti of NavayasChurna. [27]

Analysis as per Virya



According to Table 2, the analysis of Virya shows Shita Virya constitutes 60%, Ushna Virya 30%and Anushana Shita Virya 10% in the composition.
Ushna Virya exhibits Vatakaphashaman, Pittajanana, Dahan, Pachan, Swedana, Vilayana and Laghu properties.
Shita Virya provides Prasadan, SthrikaranVishyandanJivaniya and Balya properties.

Analysis as per Vipak



As per Table 2, based on the Vipak analysis, Madhur and Katu each account for 50% of the composition.

Analysis as per Doshaghanata

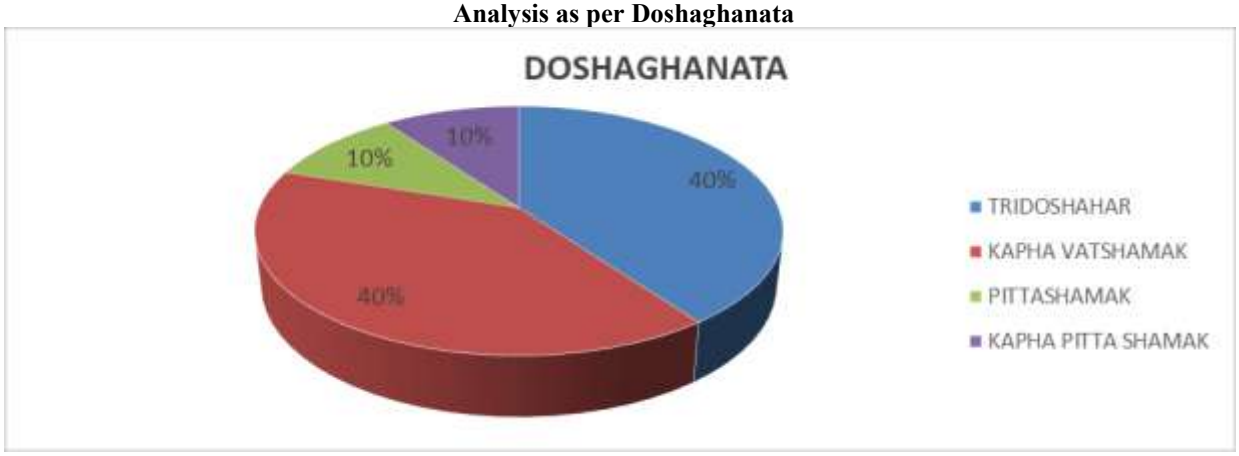
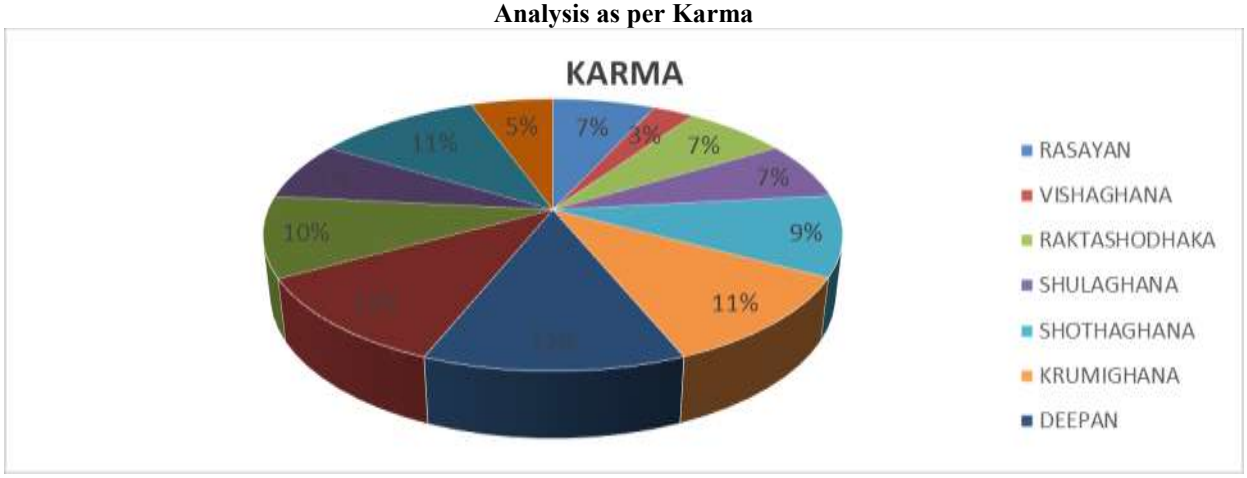


Table 3 indicates that NavayasChurna consists of 40% Kapha Vatshamak,
40% Tridoshahar and 10% each of Pittashamak and Kaphapitta Shamak properties.

Analysis as per Karma



The analysis reveals that Deepan constitutes 12.32%,
Krumighana, Pachan and Jwaraghana account for 10.95%.
Shotaghana and Kushtaghana comprise 9.58%.
Rasayan, Raktashodhana, Hrudya and Shulaghana Karma collectively make up 6.84%,

Arshoghana Karma is 5.48%,
Vishaghana Karma contributes 2.73%.

Discussion: -

In today's world, however, there is a growing interest in Ayurveda for its timeless principles, highlighting the importance of demonstrating their relevance in the modern age. It is crucial to revisit the traditional remedies to encounter the various challenges. NavayasChurnais one such remedy that needs exploration, and this is why it has been selected for review. NavayasChurna is composed of nine herbal ingredients and one mineral component, as previously mentioned.

According to Ayurvedic literature, the therapeutic indications (Rogadhikar) for NavayasChurna include Pandu, Hridroga, Bhagandara, Shotha, Kustha, Udara, Arsha, Mandagni, Aruchi and Krimi Roga.
Here, now will discuss how the ingredients of NavayasChurna help in the SamprаptiVighatana (breaking the process of disease formation) of the above diseases through their properties

Pandu

NavayasaChurna is an effective Ayurvedic formulation for managing Pandu (anemia), primarily by increasing serum Ferritin and Haemoglobin levels. Amalaki is a rich source of Iron and Vitamin C, which enhances iron absorption. Haritaki is rich in minerals and vitamin C and acts as a potent Rasayana that nourishes all Dhatus. [28] Musta has Manganese and Copper present, which help the metabolism of Iron and synthesis of Haemoglobin. [29]Lauha Bhasma supports the regeneration of Haemoglobin.[30]Trikatu enhances the bioavailability of nutrients [31] while Vidanga combats parasitic infections, a common cause of anemia and supports digestion, liver function and blood health through its Deepana, Anulomana, Hridya and Shonitasthapana actions. Together, these ingredients work to correct all types of anemia and promote overall vitality.

Hridroga

The chief ingredient in NavayasaChurna is Loha Bhasma, which primarily acts on the Rakta Dhatu by increasing Haemoglobin levels. This nourishes the heart through oxygenation. Many ingredients in this formulation also possess Rasayana properties, which help rejuvenate and strengthen cardiac function. As the blood becomes purified, the efficiency of the heart improves, helping to prevent further complications. Additionally, the ingredients exhibit antioxidant properties that reduce oxidative stress on cardiac tissues, protecting the heart from degenerative changes.

Aruchi and Mandagni

Since Ama (toxins) is widely recognized as the root cause of most diseases, initiating treatment with Deepan and Pachan therapies is essential for effective disease management. According to the analysis of Karma, nearly all the ingredients in the formulation possess Deepan and Pachan properties, which help eliminate Ama from the body. Additionally, Triphala acts as a mild laxative, alleviating constipation and subsequently relieving symptoms associated with Strotas Avarodha. Katu is the predominant Rasa in this preparation, which also plays a vital role in correcting digestion.StrotasShodhan means clearance of minute channels in the body. Furthermore, Trikatu and Trushna stimulate the liver, promoting bile secretion, which is essential for the digestion and absorption of fats.The combined properties help eliminate Ama and strengthen Agni, enabling effective disease management. The key ingredients of this formulation synergistically support Agni, facilitating SamprаptiVighatan for overall disease.

Arsha and Bhagandar

As we discussed, Ama is the root cause of most diseases. In the case of Arsha and Bhagandara, the accumulation of Ama in the gastrointestinal tract plays a crucial role in disease manifestation. Hence, the main line of treatment is Deepana andPachana. NavayasaChurna promotes Agni-dipana and enhances digestive efficiency. This not only improves overall digestion but also prevents the formation of hard stools, which is a major aggravating factor in Arsha. NavayasChurnareduces constipation. Also acts as Tri Doshahara. In Arsha, vitiated Pitta Dosha leads to Rakta Strava and Shotha, vitiated Kapha Dosha contributes to PicchilaStrava and Vitiated Vata causes Shula. The Tridoshahara effect of this formulation helps to balance all three Doshas, thereby alleviating the primary symptoms associated with Arsha and Bhagandara. The contents of NavayasaChurna are Vraṇaropaka and Rasayana, which help to heal fissures. In the condition of Bhagandara, where Puya formation is common, Navayasa Loha helps eliminate Ama, purify the Rakta Dhātu and maintain its healthy state. Many of the constituents also exhibit Shothaghna and Vyadhikshamatva-vardhaka actions, which further assist in reducing inflammation and enhancing the body's natural defense mechanisms to combat the symptoms of Arsha and Bhagandara.

NavayasaChurna, through its Dipana, Pachana, Tridoshahara, Ama-nashaka, Vrnaropaka, Rasayana and Rakta-prasadaka properties, provides comprehensive management in Arsha and Bhagandara, addressing both the root cause and symptomatic relief.

Udar
In Udara Vyadhi, vitiated Kapha and Pitta Doshas lead to fluid accumulation and inflammation. NavayasaChurna, with its Tikta and Katu Rasa, pacifies these Doshas and helps reduce inflammation. In Jalodara, Ama is a key factor. Amanash occurs due to the Deepana,Pachana action of NavayasaChurna. Lekhana, Ruksha and Laghu properties help eliminate excess Kapha, Medas, Toxins and abdominal fluid,thus preventing recurrence.

Shotha
The formulation also exhibits Shothaghna, hepatoprotective, antimicrobial, antioxidant and antibacterial effects. These support liver function, reduce swelling and fight infections. By enhancing Dhatu-agni and immunity, it promotes tissue repair and prevents chronic inflammation.

Kushtha
In the pathogenesis of Kushta Vyadhi, Ayurveda highlights seven key factors that become vitiated: Rakta, Lasika, Mamsa,Twacha and the Tridosha. Among these, Rakta Dhatu and Tridosha play a central role in disease manifestation. NavayasaChurna effectively manages Rakta Dushti and balances all three Doṣas due to its well-formulated composition. By purifying Rakta Dhatu and correcting the imbalance of Dosha, it helps relieve core symptoms of Kushta, such as Kandu, Vaivarnya, Lalima, Strava and Jadatva.
The dominance of Katu and Tikta Rasa in this formulation enhances its Shodhana and Ropana effects. These Rasas cleanse the Twacha, eliminate Ama, Dosha and promote healthy skin regeneration. NavayasaChurna helps to heal Kushta Vyadhi through systemic and local effects, hence recurrence is prevented and long-term relief is gained.

Krumi
Abnormal digestion and impaired metabolism create a conducive environment for the development and proliferation of Krumi. In this context, the formulation known as NavayasaChurna contains a predominance of Katu and TiktaRasa, both of which are traditionally recognized for their Krumighna properties. The eradication of Krumi from the body through these herbs leads to significant improvement in appetite. As digestion improves, the nutritional absorption in the gut is enhanced, resulting in better nourishment of bodily tissues and overall strengthening of the body. Through a synergistic combination of Deepana, Pachana, Krumighna and blood-purifying actions, NavayasaChurna targets eliminating Krumi and also restores digestive balance and promotes systemic health.

Conclusion: -

The formulation of NavayasChurna includes dravyas endowed with various properties which can break down the manifestation process of the Rogas mentioned in the Phalashruti, such as Pandu, Hridroga, Bhagandara, Shotha, Kustha, Udara, Arsha, Mandagni, Aruchi and Krimi Roga. The wise selection of dravyas, based on Acharya Yukti, proves to be highly relevant in the current era. The drugs used in the combination help to manage multiple diseases. The herbo-mineral components in such formulations are biocompatible and possess particles small enough to enter the bloodstream efficiently. This enhances their therapeutic potential.
The formulation, after entering the bloodstream, exhibits various actions on the target cells and achieves the results as explained above.

The combined study of traditional medicines with modern technology signifies a transformative era in healthcare, where traditional Ayurvedic wisdom converges with modern scientific understanding, offering effective and natural solutions to contemporary health challenges.

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