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A Critical Appraisal of Suvarnaprashana: Revisiting an Ayurvedic Pediatric

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Abstract

Introduction: Cognitive functions such as memory, reasoning, and decision-making are vital for personal and academic success. In the context of growing competition, there is an increasing demand for safe cognitive enhancers in children. Ayurveda offers several Medhya Rasayanas (nootropics), with Suvarnaprashana being a prominent traditional formulation aimed at enhancing mental and physical development.

Methods: Suvarnaprashana, described by Acharya Kashyapa, involves the oral administration of purified gold (Suvarna Bhasma) along with honey and ghee. This preparation is recommended during early childhood for its Rasayana and Medhya properties. The formulation is used in small doses under Ayurvedic guidelines.

Results: Classical texts attribute multiple benefits to Suvarnaprashana, including improved memory, intellect, immunity, digestion, strength, skin tone, fertility, and lifespan. These outcomes are believed to result from its ability to balance Vata and stimulate dormant Kapha, both of which influence cognitive performance.

Discussion: Ayurveda considers cognitive decline because of Vata aggravation or Kapha inactivity. Suvarna Bhasma is recognized for its penetrating and rejuvenating effects, helping to regulate these doshas. Though widely used traditionally, more clinical studies are needed to confirm their efficacy using modern scientific parameters.

Conclusion: Suvarnaprashana is a unique Ayurvedic intervention with potential benefits in enhancing cognition and overall pediatric health. Bridging traditional knowledge with empirical research can validate its role in modern pediatric practice.

Keywords: Ayurveda; Ayurvedic Immunization; Brain Booster; Cognitive Development; Child Health; Medhya Rasayana; Suvarnaprashana; Suvarna Bhasma Traditional Medicine

Abbreviations: API: Ayurvedic Pharmacopoeia of India; BBB: Blood-Brain Barrier; LSPR: Localized Surface Plasmon Resonance

Introduction

The Ayurvedic system of medicine has consistently demonstrated its efficacy in health promotion and the management of chronic ailments through its unique holistic approach. Ayurveda is a vast repository of single drugs and compound formulations, many of which have been traditionally acclaimed for their immunomodulatory potential. Among these, gold (Swarna) holds a significant place, having been utilized since ancient times for its therapeutic properties [1]. The use of gold-either alone or in combination with various herbal components-has been extensively documented in classical Ayurvedic texts [2]. Ancient healthcare systems acknowledged the potent attributes of Suvarna and incorporated it judiciously in various medicinal preparations.

Notably, the administration of gold, either as a standalone substance or along with herbs in the form of Lehana or Prash, was advocated for enhancing the immunological, intellectual, and physical development of children. In contemporary practice, Suvarnaprashana-a gold-based pediatric immunomodulatory formulation-has gained widespread acceptance across India and is increasingly recognized as a promising Ayurvedic preventive healthcare measure. Among the classical references, Suvarnaprashana described in Kashyapa Samhita provides detailed

guidelines regarding its preparation, administration, and benefits in pediatric care.

The term Lehana denotes a semisolid consistency, and the formulations under this category are traditionally administered with Madhu (honey) and Ghrita (ghee) for enhanced efficacy. Kashyapa emphasized the significance of Lehana Karma to such an extent that an exclusive chapter titled Lehadhyaya is devoted to it in the Sutra Sthana [3]. Lehana is advocated as a prophylactic intervention for all children, as it exerts beneficial effects on nutrition, metabolism, growth, physical strength, and immunity. Its purpose transcends mere disease prevention, akin to modern vaccination, by aiming to build robust immunity, ensure optimal physical and cognitive development, and improve the overall health status of the child.

Materials & Methods

A comprehensive literature review was conducted using various sources, including classical Ayurvedic texts, standard modern medical textbooks, and online scientific databases such as PubMed and ResearchGate. Additionally, documents such as the Ayurvedic Pharmacopoeia of India (API) were reviewed to support the study. The search strategy included keywords such as "Suvarnaprashana Samskara," "Samskara," and "intellectual performance." Relevant peer-reviewed articles, previous research studies, and classical treatises were identified and analyzed to understand the conceptual basis, preparation methods, and therapeutic applications of Suvarnaprashana, with particular focus on its role in enhancing cognitive functions in children.

Suvarnaprashana

The Ayurvedic system of medicine has consistently demonstrated its unparalleled success in promoting health and managing chronic diseases through its unique, holistic approach. One of the notable interventions in pediatric care within Ayurveda is Suvarnaprashana, a formulation with immunomodulatory and cognitive-enhancing properties. The term Suvarnaprashana is derived from two Sanskrit words—Suvarna, meaning gold, and Prashana, meaning the act of ingesting or licking. In Ayurvedic literature, the use of Suvarnaprashana in children is primarily linked to two important contexts: Lehana (supplementary feeding) and Jatakarma Samskara (one of the sixteen sacraments or rites of passage performed after birth) [4].

Preparation for Suvarnaprashana

The method of preparing Suvarnaprashana is clearly described by Acharya Kashyapa in his classical text Kashyapa Samhita. According to his guidelines, the person preparing the formulation should be seated facing the east direction, symbolizing auspiciousness and purity of intention. The process begins with the thorough cleansing of the Shila (stone slab) and Suvarna (gold). A small quantity of water is used to gently rub the gold on the stone surface until fine particles are obtained. Following this, equal parts of Madhu (honey) and Ghrita (ghee) are added to the gold paste. These ingredients are mixed thoroughly to form homogeneous, semi-solid preparation. The resulting Suvarnaprashana is then considered suitable for administration to children, particularly for enhancing their immunity, intellect, and physical strength [5].

Dose of Suvarnaprashana

There is no direct or specific reference regarding the exact dosage of Suvarnaprashana in the ancient Ayurvedic texts by any sage or commentator. However, Acharya Kashyapa, in his treatise Kashyapa Samhita, has provided general guidelines for pediatric dosing in sections such as Sutra Sthana and Khilasthana. These principles can be adopted as a basis for estimating the appropriate dose of Suvarnaprashana in children. In addition to Kashyapa's guidelines, various classical texts of Rasa Shastra offer valuable insights into the therapeutic dosage of Suvarna (gold), which can further aid in determining a safe and effective dose of Suvarnaprashana. These references consider the form, preparation method, and age or weight of the child (Tables 1 & 2).

Table 1: Dose of Suvarna (Gold) as Mentioned in Various Ayurvedic Textbooks.

S.NO.	Name of Textbook	Dose of Gold (As per textbook)	Dose in Modern Measurement Units
1.	Rasataranagin [6]	$1/4^{th}$–$1/8^{th}$ Ratti	15–30 mg
2.	Rasaratna Samuchaya [7]	2 Gunja	250 mg
3.	Sushruta Samhita [8]	1 Gunja	125 mg
4.	Astanga Hridaya [9]	1 Harenu	250 mg
5.	Bhaishajya Ratnavali [10]	1/32 Ratti	3.9 mg
6.	Rasa Prakash Sudhakar [11]	1/2 Ratti	62.5 mg
7.	Ayurved Prakash [12]	1 Yava	62.5 mg
8.	The Ayurvedic Formulary of India [13]		15.5–62.5 mg

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Table 2: Dose of Suvarna Bhasma According to Suvarnaprashana Protocol [14].

Age group	Range of dose of Suvarna Bhasma	Average recommended dose	Form of Administration
0-1 year	1.2-2.4 mg	1.8 mg ≈ 2mg	Mixed with honey and ghee
2-6 years	2.1-9.9 mg	6 mg	Mixed with honey and ghee
7-12 years	5.85- 15 mg	10.43 mg≈ 10mg	Mixed with honey and ghee
13-16 years	7.8-17.1 mg	12.5 mg	Mixed with honey and ghee or as per clinical need

Duration of Suvarnaprashana

Suvarnaprashana can be administered from birth up to sixteen years of age, aligning with the critical phases of growth, development, and cognitive maturation in children. Classical Ayurvedic principles emphasize the importance of early intervention during this formative period to maximize physical strength, immunity, and intellectual capacity. Clinically, Suvarnaprashana is generally recommended for a minimum duration of 6 months to 1 year, and in some cases, even up to 2 years, to achieve appreciable therapeutic outcomes. However, its benefits are optimized when administered regularly and consistently.

A common contemporary practice involves administering Suvarnaprashana once a month on the day of Pushya Nakshatra, believed to be astrologically auspicious. Despite its popularity, there is limited clinical evidence supporting the effectiveness of this monthly protocol in providing sustained immunological or cognitive benefits. Further scientific studies are needed to validate its efficacy when given exclusively on this day. Therefore, based on available classical and clinical data, continuous administration of Suvarnaprashana for a period of up to 6 months is considered both rational and beneficial for enhancing overall pediatric health.

Suitable Form of Suvarna (Gold) Used for the Preparation of Suvarnaprashana

The earliest reference to the use of gold in Suvarnaprashana is found in the Kashyapa Samhita, dating back to the 6th century CE. In this text, Suvarna Shalaka (gold rod or wire) is recommended for rubbing against a stone slab (Shila) to obtain fine gold particles for use in pediatric formulations [14]. At that time, other pharmaceutical forms of gold-such as Suvarna Bhasma (calcined gold ash), Suvarna Patra/Mandala (gold leaf or foil), and Suvarna Churna (gold powder)-had not yet been developed, as these preparations only came into widespread use with the advancement of Rasa Shastra during the 13th century CE [15].

Modern studies have shown that Suvarna Bhasma (with approximately 90% pure gold) contains gold nanoparticles with crystallite sizes ranging from 28–35 nanometers. These particles are microfine, non-cytotoxic, and exhibit beneficial properties such as non-aggregation of blood cells, no protein adsorption, and the ability to open intercellular tight junctions-making them safe and effective for internal administration in children [16]. Today, Suvarna Bhasma is the recommended form of gold used in the standard Suvarnaprashana protocol due to its safety profile, bioavailability, and well-established Ayurvedic validation.

Benefits of Suvarnaprashana

Suvarnaprashana, a traditional Ayurvedic formulation, is highly valued for its multifaceted benefits in pediatric care. According to classical texts, it promotes Medha (intellect), Agni (digestive fire), and Bala (physical strength and immunity), thereby enhancing cognitive functions, metabolism, disease resistance, and overall vitality. It is also said to support Ayushya (longevity), bring Mangala (auspiciousness), promote Punya (spiritual merit), act as Vrushya (aphrodisiac), improve Varna (complexion and skin texture), and protect from negative influences including microbial infections and malevolent forces (Grahapaham) [3]. The Kashyapa Samhita elaborates on the specific benefits depending on the duration of administration. If Suvarnaprashana is given daily for one month, the child is believed to attain superior intelligence (Parama Medhavi) and become resistant to common illnesses (Vyadhibhir Na Cha Drishyate).

Prolonged administration for six months is said to enhance auditory perception, memory retention, and recall ability to an exceptional level, leading to the development of Shrutadhara-a child capable of retaining information even upon mere hearing [17]. Gold (Suvarna), the key ingredient in Suvarnaprashana, has been recommended for internal use in Ayurveda since ancient times due to its Rasayana (rejuvenative) and Vajikarana (aphrodisiac) properties [18]. Its usage is advised even before conception to promote the health of future progeny. During pregnancy, it is employed in Pumsavana Karma-a ritual aimed at obtaining a healthy and desirable offspring [19]. Postnatally, gold is incorporated during Jatakarma Samskara (birth rituals) and given as part of Lehana (supplementary feeding practices) to support the child's growth and holistic development [20].

Indications of Suvarnaprashana

According to Acharya Kashyapa, Suvarnaprashana is categorized under Lehana Yogas (supplementary feeding therapies). Hence, all classical indications of Lehana are applicable to Suvarnaprashana as well. It is especially recommended for infants whose mothers are unable to breastfeed due to absence, insufficiency, or vitiation of breast milk. It is also advised for neonates born after difficult labor or in cases where the mother is severely ill and cannot provide adequate nourishment. Further, Suvarnaprashana is indicated in infants who cry excessively due to hunger, remain unsatisfied despite frequent breastfeeding, or have

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irregular sleep patterns during the night.

It is also beneficial for those who do not pass urine and stool for three consecutive days despite having a good digestive fire. Additionally, infants with dominant Vata or Pitta prakriti (bodily constitution) are considered ideal candidates for Suvarnaprashana. Even children who are delicate, lean, thin, or emaciated despite being free from any apparent disease, general debility-both mental and physical-such as chronic fatigue, allergies, loss of appetite, poor digestion, dull skin tone, and delayed onset of puberty are suitable for its administration [21].

Contraindications of Suvarnaprashana

There are no explicit contraindications of Suvarnaprashana mentioned directly in any classical Ayurvedic text. However, Acharya Kashyapa, while discussing the indications and contraindications of Lehana (supplementary feeding), provides guidelines that can be applied to Suvarnaprashana as well, since it is considered a form of Lehana. Accordingly, Suvarnaprashana is contraindicated in children with poor digestive power, low appetite, or those who exhibit excessive sleep and frequent or voluminous passage of stool and urine. It should be avoided in robust, well-nourished children with a strong constitution, as they may not require such supplementary formulations.

Additionally, it is contraindicated in children whose mothers are deceased and are suffering from indigestion or various systemic ailments. Specific conditions where Suvarnaprashana should not be administered include disorders of the eyes, ears, nose, and throat; metabolic dysfunctions; fever; diarrhea; jaundice; edema; anemia; cardiac disorders; respiratory distress; cough; flatulence; anorectal diseases; vomiting; and infectious conditions. Moreover, it should be avoided in children consuming heavy (guru) breast milk or those who are already receiving a full range of tastes (all six Rasas) through diet [22].

Mode of Action of Suvarnaprashana

Suvarnaprashana is composed of Suvarna Bhasma (calcined gold), Ghrita (ghee), and Madhu (honey), which together form a lipid-based emulsified mixture like chylomicrons-small fat globules that facilitate rapid absorption through the oral mucosa. A portion of the fatty acids in this preparation is directly absorbed into the portal circulation, bypassing conversion into triglycerides and lymphatic absorption. This mechanism allows quick and efficient diffusion into the capillary blood of the intestinal villi, enhancing systemic bioavailability [23].

The immunomodulatory action of Suvarnaprashana is primarily attributed to honey. Natural antigens present in honey are captured by dendritic cells, which then interact with T-lymphocytes to initiate an adaptive immune response. This process leads to the formation of specific antibodies, thereby strengthening the immune system of the child [24]. Suvarna Bhasma, in its nano-particulate form, readily binds with ghee and honey, forming a synergistic delivery system capable of crossing the blood-brain barrier (BBB). Since the BBB is lipophilic in nature, lipid-soluble substances, especially those delivered in the form of Ghrita- are more likely to penetrate the central nervous system effectively. Once across the BBB, the gold nanoparticles exert Medhya (nootropic or intellect-promoting) effects by nourishing and stabilizing neuronal activity [25].

Honey also contributes significantly to neurocognitive health. Its rich content of polyphenols exhibits neuroprotective properties and helps in the prevention of memory decline by modulating neurochemical pathways at the molecular level. Furthermore, honey helps in clearing the Manovaha Srotas (channels of the mind), thereby reducing physical and psychological stress [26]. Ghee, another essential component, plays a critical role in enhancing cognitive functions. It serves not only as a lipid vehicle for deeper tissue penetration but also supports chemical balance in the brain. Traditional Ayurvedic literature attributes Ghrita with Medhya properties, which are now increasingly supported by modern research for its positive effects on memory, intellect, and emotional well-being [27].

Research on the Safety of Gold Compounds

Several experimental and clinical studies have been conducted to evaluate the safety profile of gold-based preparations used in Ayurveda, particularly Suvarnaprashana. In a preclinical study on albino rats, the administration of Suvarna Bindu Prashana exhibited no signs of toxicity, indicating its safety at the tested dosage.28 Another study demonstrated that Suvarna Prashana has a positive influence on cell-mediated immunity, particularly in response to triple antigens, and showed potential anti-amnestic and immunostimulant properties [29].

Further toxicological evaluation in animal models revealed that acute oral administration of Suvarna Bhasma caused no mortality in mice, even at doses as high as 1ml per 20g body weight of suspension containing 1mg of the drug. Chronic administration also did not produce any toxic effects, as confirmed by stable levels of serum biomarkers including SGOT, SGPT, serum creatinine, and urea, along with normal histological findings in vital organs [30]. In an independent study, Hainfeld et al. [31] observed that even a single high dose of gold nanoparticles (2.7g/kg body weight) did not induce toxicity in mice bearing subcutaneous EMT-6 mammary carcinomas.

The study also documented that gold nanoparticles were efficiently excreted through urine and feces, indicating favorable biocompatibility and clearance mechanisms [31]. Clinical research involving pediatric subjects has also supported the safety of Suvarnaprashana. Long-term and regular administration was found to be non-toxic, well-tolerated, and exhibited significant immunomodulatory effects in children, further validating its use in pediatric health promotion [32].

Discussion

Gold, or Suvarna, being a metal, poses challenges in its direct

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administration and standard dose formulation. Ayurveda addresses this through Suvarna Bhasma, a classical herbometallic preparation where the raw metal undergoes numerous incineration and purification processes to convert it into a fine powder composed of nano- to submicron-sized particles [33]. These particles, due to their minute size, are presumed to be absorbable through the sublingual route directly into the bloodstream, although conclusive experimental evidence for this specific route remains limited [34]. Honey, traditionally used as an Anupana (carrier) in Ayurvedic medicine, consists primarily of carbohydrates-making up 95–97% of its dry weight-along with proteins, amino acids, vitamins, minerals, and organic acids [35].

It is rich in flavonoids, polyphenols, reducing sugars, alkaloids, glycosides, and volatile compounds. The monosaccharides fructose and glucose are the major contributors to its nutritional and physiological effects [36]. Pharmacologically, honey exhibits a wide range of therapeutic actions including antioxidant [37], anti-inflammatory [38], antimicrobial [39] antidiabetic [40] anticancer, and antimetastatic properties. Its polyphenolic content offers neuroprotective and nootropic effects by mitigating oxidative stress in the central nervous system. Enzymatic antioxidants present in honey neutralize free radicals by converting them into inert substances like water and oxygen, thereby supporting brain health and cognitive functions [41].

Ghrita (clarified butter) is another classic Ayurvedic carrier known for its nourishing, cooling, and unctuous properties. It is considered a Medhya Rasayana, promoting cognition, vitality (Oja), strength (Bala), and longevity (Ayushya) [42]. Modern research highlights its richness in omega-3 fatty acids, which play a critical role in brain-cell membrane integrity and myelination of neurons. The brain, composed of nearly 60% fat, depends heavily on such quality fats for optimal function. Desi Ghee is also abundant in vitamin E, a potent antioxidant that protects brain cells from oxidative stress and free radical damage [43]. Due to its lipophilic nature and low molecular weight, Ghrita may facilitate the passage of active compounds across the blood–brain barrier (BBB), thus delivering neurological benefits and balancing neurotransmitter activity [44].

Suvarna Bhasma is described in Ayurveda as Vrushya (aphrodisiac), Ayushya (promoter of longevity), Balya (strengthening), Bruhana (anabolic), Ojovardhaka (vitality enhancer), and Sarvavishapaha (detoxifier) [45]. It possesses Kashaya, Tikta, and Madhura rasa; Madhura vipaka; Sheeta veerya; and Guru and Snigdha properties, which contribute to its multi-dimensional therapeutic effects. Gold nanoparticles (AuNPs), typically 1–100 nm in diameter, share structural similarities with Suvarna Bhasma at the nano scale. When dispersed in water, they form colloidal gold, exhibiting unique optical characteristics with a maximum absorption peak observed in particles ranging from 12 to 41nm [46]. Their physicochemical properties-such as localized surface plasmon resonance (LSPR), high X-ray absorption, and biocompatibility-make them valuable in targeted drug delivery and diagnostics.

The surface of AuNPs can be functionalized with S- and N-containing ligands, enhancing their bioavailability, targeting efficiency, and compatibility with biological systems. Modifications in size, shape, and structure can further optimize their pharmacological potential [47]. Neurologically, AuNPs have shown promise in enhancing cognitive function and alleviating depression. They are believed to modulate synaptic transmission, enhance neuronal communication, and stabilize emotional imbalances [48]. Their impact on neural electrical activity may contribute to improvements in focus, memory, and learning capacity. This forms the basis for the traditional claim that Suvarnaprashana, administered regularly, improves a child's intellect, grasping ability, analytical skills, and memory recall in a distinctive and holistic manner [49].

Conclusion

Suvarnaprashana, a time-honored Ayurvedic formulation, is regarded as particularly effective when administered shortly after birth, with a single dose believed to provide foundational benefits for immunity and development. For enhanced preventive and cognitive outcomes, monthly administration is traditionally recommended. Classical Ayurvedic texts, particularly Kashyapa Samhita, emphasize that daily administration for one month significantly promotes intellectual growth and disease resistance in children.

Furthermore, extended use for six months is said to sharpen cognitive functions, improve memory retention, and accelerate learning capacity, enabling the child to grasp and recall information with greater ease. These observations reflect the Rasayana (rejuvenative) and Medhya (nootropic) properties attributed to Suvarnaprashana. In light of both its classical endorsements and emerging pharmacological rationale, Suvarnaprashana holds substantial p Considering safe, preventive, and promotive pediatric intervention. However, further scientific studies and clinical validation are necessary to substantiate its long-term efficacy and standardize its use in contemporary child healthcare practices.

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