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EXPLORING THE THERAPEUTIC POTENTIAL OF SWARNAPRASHANA- A NOVEL UNIFICATION OF AYURVEDA AND IMMUNIZATION

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ABSTRACT

The practice of administering processed gold to children, known as “Swarnaprashana,” is a distinctive approach outlined in Ayurveda by Acharya Kashyapa thousands of years ago. He clearly described the use of Swarna (gold) in children for its benefits, including enhanced intellect, improved digestion and metabolism, increased physical strength, better immunity, enhanced complexion, fertility, and longevity. The appropriate age for Swarnaprashana administration and its duration can be established based on the intended benefits of a proactive health care regimen for children. Swarnaprashana is primarily relevant in Ayurvedic contexts: Lehana (supplementary nutrition) and Jatakarma Samskara (care of newborns). The foundational references for Swarnaprashana in children are found in two classical texts of Ayurveda: Jatakarma Samskara and Lehana. Detailed discussions on the appropriate age and method of administration, associated benefits, and dosage according to various classical Ayurvedic texts and findings from related scientific studies are provided. Ayurveda emphasizes the use of only purified and processed gold for internal consumption. Traditionally, Swarnaprashana involves grinding gold on a stone with a bit of water and blending it with ghee and honey. Swarnamritaprashana is a lickable polyherbal formulation based on ghee and honey, incorporating gold as bhasma (calcined ash). This formulation was created to eliminate the need for the daily grinding and mixing process while addressing specific health needs for children. The broad-

spectrum properties of Swarnamritaprashana can be attributed to its ingredients, including Mandukaparni (Centella asiatica), Shankhapushpi (Convolvulus pluricaulis), Yashtimadhu (Glycyrrhiza glabra), Amrita (Tinospora cordifolia), Vacha (Acorus calamus), Jatamansi (Nardostachys jatamansi), along with Ashwagandha (Withania somnifera), Pippali (Piper longum), and Swarna Bhasma (incinerated gold), combined with ghee and honey. This preparation can be easily given to children in the necessary mode.

Keywords: *Swarnaprashana*, Immunisation, *Ayurveda, Sanskara, Jatakarma*

INTRODUCTION

Swarnaprashana, a traditional practice rooted in Ayurveda, is gaining attention as a novel approach to immunisation. Combining traditional wisdom with a contemporary understanding of immunology, *Swarnaprashana* offers a unique perspective on enhancing immunity and promoting overall health. *Swarnaprashana*, which involves administering gold rubbed with water on a clean stone and mixing it with ghee (clarified butter) and honey, is specifically formulated for children. This inventive concoction also incorporates specific medicinal plants. The administration of gold in this manner is believed to have various benefits including boosting intellect (*Medha*), digestion and metabolism (*Agni*), strength (*Bala*), promoting a healthy long life (*Ayushya*), auspiciousness (*Mangalam*), bestowing blessings (*Punyam*), acting as an aphrodisiac (*Vrishyam*), improving complexion (*Varnyam*), preventing infections and behavioural problems (*Grahapaham*).[1]

In the *Jatakarma Samskara* (caste rituals), Acharya Sushruta mentions the administration of Swarna, honey and ghee as one of the procedures for newborn care. He provides the rationale behind this practice, stating that adequate secretion of breast milk is not expected for the first 4 days after delivery. Therefore, such practices are considered indispensable to support the baby in terms of preventive and nutritive aspects during this period. Similarly, Acharya Vagbhata advises giving a combination of herbal drugs in a spoon shaped like the leaf of a holy banyan tree, made of gold, to the newborn to enhance intellect. As mentioned by Acharya Kashyapa, Continuous administration of *Swarnaprashana* for one month is said to result in the child becoming highly intellectual (*Parama Medhavi*) and less prone to frequent illnesses (*Vyadhibhih na cha drushyate*). If given continuously for six months, the child is believed to develop an excellent retention capacity (*Shrutadhara*).

The International Food Policy and Research Institute (IFPRI) publishes the Global Hunger Index (GHI) annually. The 2019 report shows India is ranked 102nd out of 119 countries. Prevalence of undernutrition among under five children according to the National family health survey 4 (NFHS 4) in India shows that 35.7% under five children were underweight, 38.4% were stunted and 21% were wasted. From National family health survey 1 to National family health survey 4, the prevalence of undernutrition has not declined as desired. According to the Comprehensive National Nutrition Survey report, 35% of Indian children aged 0–4 years were stunted, 17% were wasted, and 33% were underweight. Malnutrition in the form of undernutrition, namely underweight, stunting and wasting, has been coined as the "silent emergency" by the United Nations children's fund. Indeed, out of the 11.6 million deaths among under-five children in 1995 in developing countries, it has been estimated that 6.3 million or 54% of young child mortality were associated with malnutrition.[2]

In children, the prevalence of recurring infections, nutritional deficiencies, antibiotic resistance, and various behavioural and psychological issues such as attention deficit hyperactivity disorder (ADHD), autism, and behavioural disorders, along with poor academic performance and metabolic disturbances, remain significant concerns. Moreover, the competitive environment and the pressure to excel have introduced stress into children's lives, which may contribute to a higher incidence of non-communicable dis-

eases. Despite extensive efforts, including vaccination, nutritional interventions, educational initiatives, and developing new vaccines and medications, children's health issues seem persistent.

Given these challenges, there is a renewed interest in reintroducing the ancient tradition of Swarnaprashana to address contemporary needs. Consequently, Swarnamritaprashana has been formulated to adapt this age-old practice to current circumstances.

DIFFERENT PRACTICES OF SWARNAPRASHANA

In India, various practitioners employ different methodologies for administering Swarnaprashana. Some incorporate Swarna Bhasma into honey, shaking the mixture before administering it to children. Others embed Swarna and honey within Vacha Moola, burying them in soil and retrieving them on Pushya Nakshatra for use. However, the efficacy of these techniques remains uncertain.

Swarnaprashana is administered orally on an empty stomach, preferably in the early morning, and is suitable for children from birth up to 16 years of age. The dosage starts with two drops for infants under 6 months and increases to four drops thereafter. It can be given daily *(Nitya Prashana)* for a minimum of 30 days and up to a maximum of 180 days or administered every pushya nakshatra (approximately every 28 days) for a minimum of 30 doses. Swarnaprashana should be administered consistently over 30 days to optimise the immunomodulatory effects, with the option to extend the regimen up to one Mandala, equivalent to 48 days. This duration allows for gradually enhancing the immune system's response, maximising the potential benefits of the practice. Swarnaprashana can be administered to all children from the day of their birth up to the age of 16 years.

PHARMACOLOGICAL INSIGHTS INTO SWARNAPRASHANA ACCORDING TO AYURVEDA

Its formulation comprises renowned nootropic herbs from Ayurveda, including Brahmi (Bacopa monnieri), Shankhapushpi *(Convolvulus pluricaulis)*, Yashtimadhu (*Glycyrrhiza glabra*), Vacha (*Acorus calamus*), and Jatamansi (*Nardostachys jatamansi*). Additionally, it contains Ashwagandha (*Withania somnifera*), Pippali (*Piper longum*), and Swarna bhasma (*incinerated gold*), blended with ghee and honey as the base.

The pharmacological properties of Swarnamritaprashana include Madhura (sweet), Tikta Kashaya (bitter and astringent taste), Madhura Vipaka (sweet aftertaste), Sheeta Veerya (cooling potency), and gunas characterised by laghu (light), snigdha (unctuous), soumya (pleasing), and Tridosha shamaka (balancing the three doshas). The formulation comprises ingredients such as Mandukaparni, Shankhapushpi, Vacha, Guduchi, Yashtimadhu, and Jatamansi, all of which are considered Medhya (nootropic) due to their specific action (Prabhava). Additionally, herbs like Ashwagandha, Guduchi, and Pippali exhibit Rasayana (rejuvenating) and Balya (strength-promoting) properties, contributing to the overall therapeutic effects. The qualities of these individual herbs are retained in the ghee, the base of the formulation, owing to its capacity for Samskara Anuvartana (absorption and retention of the qualities of constituent drugs). Furthermore, ghee itself is known to possess Medhya properties, enhancing the cognitive benefits of Swarnamritaprashana.

MECHANISM AND PROTOCOL FOR SWARNAPRASHANA ADMINISTRATION

Swarna Bhasma, or gold ash, is known to enhance memory and boost immunity when administered in very low doses over a specific duration. Despite its simplicity, there are uncertainties regarding the mixing and absorption of Swarna Bhasma in its oxide form. The mechanism by which crude Swarna remains absorbable in the body is discussed. It is possible that unabsorbed Swarna acts as an incompatible substance or binding material, potentially stimulating the immune system. Gold exhibits immunomodulatory effects due to its antibacterial action, which is further enhanced when combined with honey and clarified butter.

It offers heightened benefits, particularly for children exhibiting low immunity, poor intellect, diminished memory power, and those diagnosed with dyslexia. However, it is essential to note that Swarnaprashana is contraindicated for children experiencing fever, dysentery, indigestion, and similar conditions.

Swarna bhasma exhibits moisturising and unctuous effects on the body, attributed to its madhura (sweet) nature, which contributes to its rejuvenating properties (rasayana). Additionally, it aids in detoxification and can effectively treat conditions such as vishama jwara (intermittent fever), antra jwara (enteric fever), and weakness. Scientific research has substantiated its antioxidant, antidepressant, anticancer, antibacterial, and anti-rheumatoid properties and its role as a nerve stimulant.

GOLDEN IMMUNOMODULATION: UNVEILING GOLD'S POTENTIAL TO FINE THE IMMUNE SYSTEM

Gold nanoparticles, which are biodegradable and well-tolerated by living cells, offer advantages such as high loading efficiency for target substances, enhanced ability to traverse physiological barriers, and low systemic side effects. In Ayurvedic Bhasmas, gold is used as purified metallic fine powder, likely as nanoparticles or a red colloidal solution. Both forms are prepared through elaborate treatments, including herbal extracts and sometimes other metals. The successful preparation of genuine Ayurvedic Bhasmas relies on the technique of heat treatment known as "Putas," which involves subjecting the homogeneous paste prepared by thoroughly mixing microfined metal with appropriate plant juices to multiple calcination cycles. Each cycle requires the repeated process of freshly mortaring the microfined metal and plant juice. Consequently, synthesising these Bhasmas is a complex and laborious procedure, with Ayurvedic experts adhering to specific Standard Operating Procedures (SOP) and Good Manufacturing Practices (GMP) norms as notified by the Department of AYUSH.

Researchers have extensively studied metal nanoparticles' mode of metal nanoparticles. Harvard Medical School found that special gold, platinum, and other metals strip bacteria and viruses from immune system proteins, particularly MHC class II proteins linked to autoimmune diseases. Swarnaprashana utilises smaller gold particles with diverse characteristics, interacting with antigen-presenting cells (APCs) like dendritic cells. The mechanism involves dendritic cell internalisation of gold particles through various processes, leading to differentiation into mature dendritic cells and antigen presentation to T cells. Swarnaprashana's mosaic features facilitate intercellular trafficking within dendritic cells, allowing effective antigen presentation. Activating dendritic cells and T cells require cytokines like IL-7, IL-6, IL-10, IL-12, IL-23, TNF, and IFN. Swarnaprashana shows promise in immunomodulation and vaccine development, aligning with ancient texts suggesting its ability to induce robust immunity-like vaccines. [3, 4, 5]

Recent research highlights size-dependent absorption patterns of gold nanoparticles through rat skin and intestines, with smaller particles (15 nm) showing higher absorption rates. Sublingual absorption directly into the bloodstream is also possible. Swarna bhasma analysis shows gold content at 20.34%, with minimal traces of other elements like arsenic (0.17%) and lead (0.03%), contributing to its therapeutic applications.

HARNESSING THE NOOTROPIC AND ANTIMICROBIAL POWER OF HONEY IN SWARNA PRASHANA

Madhu, derived from pollen by bees, is vital in Swarna Prashana. Administered in infancy, it enhances resistance to allergens, reducing allergic disorders. Raw honey exhibits nootropic effects, improving memory, and neuropharmacological activities like anxiolytic and antidepressant effects while boosting immunity through T and B lymphocyte proliferation and phagocytosis stimulation.[6]

Recently, studies have shown that the methylglyoxal content of honey is responsible for much of the honey’s antimicrobial properties. It was proven that methylglyoxal effectively inhibited the growth of gram-positive and gram-negative bacteria. These inhibitory effects were well-discovered, and it started when methylglyoxal levels reached 0.3 mm in media,

causing alterations in the structure of bacterial fimbriae and flagella, which would limit bacteria adherence and motility. However, no information precisely describes the mechanisms of activity for methylglyoxal against viruses. In the next section, the potential mechanisms of the antiviral properties of honey are further discussed.[7]

The belief in honey's memory-boosting properties is deeply rooted in ethno traditional and ancient practices. For example, honey is a significant ingredient in Brahma Rasayana, an Ayurvedic formulation prescribed to enhance lifespan and improve memory, intellect, concentration, and physical strength. One well-established nootropic property of honey is its role in promoting the building and development of the central nervous system, particularly in newborns and preschool-age children. This, in turn, leads to improved memory and growth, reduced anxiety, and enhanced intellectual performance later in life.

GHRITA IN SWARNAPRASHANA: A NUTRITIONAL AND THERAPEUTIC ESSENTIAL

Ghrita holds significant medicinal value in Ayurvedic literature and is renowned for its ability to augment mental acuity and enhance the efficacy of medicinal compounds combined with it. It plays a crucial role in the growth and development of children, providing essential nutrition until proper lactation begins. Medicated ghee, a potent polyherbal formulation, is often prescribed to address various central nervous system (CNS) disorders. Its lipid-based nature suggests the potential for crossing the blood-brain barrier, thereby exerting beneficial effects on brain tissue.[8]

Due to its high lipid solubility, ghee effortlessly traverses the blood-brain barrier, facilitating the transportation of active components to specific target sites within the CNS. Ayurveda extols ghee as the healthiest source of edible fat, possessing intrinsic beneficial properties that enhance the positive effects of herbal drugs incorporated into medicated ghee formulations. It is well-documented that Go Ghrita, a specific type of ghee derived from cow's milk, promotes longevity and preserves the normal functioning of bodily entities, including intellect and memory.[9]

Limited studies focus on ghee's impact on brain health, but individual components like SCFAs, omega-3 fatty acids, and CLAs show promise. SCFAs combat inflammation in Alzheimer's, while DHA, EPA, and CLAs aid cognition and brain inflammation. Butyric acid boosts intestinal killer T cells, while omega-3s aid immune response in CLA trials.[10]

SHANKHAPUSHPI (*CONVOLVULUS PLURICAULIS):* ELEVATING SWARNAPRASHAN AS A REVERED COGNITIVE ENHANCER

Shankhapushpi is highly esteemed in Ayurveda for its remarkable ability to promote intellect and cognitive function. Its chemical composition includes microphytic acid, shankhapushpin, kaempferol-kaempferol-3-glucoside, 3, 4 hydroxycinnamic acid, and sitosterols. Shankhapushpi's neuroprotective and intellect-promoting properties are attributed to its free radical scavenging and antioxidant abilities.

Clinical studies have demonstrated the effectiveness of Shankhapushpi in addressing conditions such as Manasa-mandata (mental retardation) and Chittodvega (anxiety disorders). Moreover, Shankhapushpi exhibits potent antidepressant effects in mice and displays the highest inhibitory activity against Helicobacter muridarum.

Convolvulus pluricaulis (CP) extract enhances memory in healthy rats by modulating hippocampal synaptic plasticity, as supported by multiple studies. CP protects against neuronal injury, memory deficits, and Alzheimer's disease (AD) markers like tau and amyloid precursor protein (APP). It rescues neurons in AD models, reduces oxidative stress in Parkinson's disease (PD) models, and improves brain pathology in ischemic reperfusion injury models. CP also mitigates memory deficits in diabetes-induced cognitive impairment, alleviates anxiety, depression, and epileptic seizures, and helps animals cope with stress.[11]

GLYCYRRHIZA GLABRA: ENHANCING SWARNAPRASHAN WITH THE ROOT OF THERAPEUTIC POTENTIAL

The fine powder derived from dried roots and milk is utilised internally as a Medhya for therapeutic purposes. Glycyrrhiza glabra roots and rhizomes are an

effective brain tonic, enhancing circulation to the central nervous system and regulating blood sugar levels. The multifaceted benefits of Yashtimadhu can be attributed to compounds like glycyrrhizine and flavonones. Research on Glycyrrhiza glabra roots and rhizomes has explored its impact on spatial learning, passive avoidance, preliminary free radical scavenging, cerebral ischemia, memory enhancement in dementia, antioxidant capacity against LDL oxidation, and mitigation of antihypoxic effects induced by sodium nitrite.

Glycyrrhiza glabra appears to be a promising drug for improving memory in the management of impaired learning, dementia, Alzheimer's disease, and other neurodegenerative disorders. Also, the study shows improvements in motor dysfunction and neurological disorders and inhibition of microglia activation and proinflammatory cytokine production followed by neuroprotective impact. The potential antidepressant like activity of liquorice may be attributed to its ability to inhibit monoamine oxidase. The studies support the antioxidant property of Glycyrrhiza, as the antioxidants play a role in safeguarding brain cells against the harmful effects of oxidative stress. This leads to a decrease in brain damage and promotes the functioning of neurons, ultimately enhancing memory.[12]

THE ROLE OF *VACHA* IN SWARNAPRASHANA: HARNESSING NATURE'S REMEDIES

Rhizomes have long been valued in Indian and Chinese medicine for their therapeutic benefits, particularly in addressing central nervous system abnormalities. These roots of Vacha contain active medicinal compounds such as α-asarone, elemicine, cis-isoelemicine, isoeugenol isomers and their methyl ethers, camphene, P-cymene, β-gurjunene, α-selinene, β-cadinene, camphor, terpinen-4-ol, α-terpineol, and α-calacorene, among others. Additionally, acorone, acrenone, acoragermacrone, 2-deca-4, 7-dienol, shyobunones, linalool, preisocalamendiol, acoradin, galangin, 2, 5-trimethoxy benzaldehyde, 2, 5-dimethoxy benzoquinone, calamendiol, spathulenol, and sitosterol are also present.

The methanolic *Acorus calamus* rhizome extract (12.5 g/mL) prevented the VCAP-1 and intercellular expression on the surface of mouse myeloid leukaemia cells and murine endothelial cells, respectively. Aqueous *A. calamus* leaf extract was studied on HaCaT cells. It restricted the characteristics of interleukin (IL)-8, IL-6 RNA protein levels alongside interferon regulatory factor 3 (IRF3) and nuclear factor kB (NF-κB) activation. The essential oil isolated from *A. calamus* was evaluated by protein denaturation assay, where at the concentration level of 300 µg/mL, 69.56% of the inhibition level was observed.[13]

The in vitro antioxidant activity of acetone, acetonitrile, alcoholic, and aqueous extracts of *A. calamus* rhizomes exhibited free radical scavenging activity on the [2,2-azinobis (3-ethylbenzothiazoline-6-sulphonic acid)] free radical scavenging activity assay (ABTS), the (1, 1-diphenyl-2-picrylhydrazyl) free radical scavenging activity assay (DPPH), and the ferric ion reducing antioxidant power assay (FRAP). The methanol extract shows anticonvulsant effects feasibly through potentiating the action of the gamma-aminobutyric acid (GABA) pathway in the central nervous system. The interaction of the methanolic A. calamus rhizome extract with the adrenergic, dopaminergic, serotonergic, and GABAergic systems was found responsible for the expression of antidepressant activity.[14]

NARDOSTACHYS JATAMAMSI: UNVEILING ITS MEDICINAL POTENCY IN SWARNAPRASHANA

Rhizomes of Nardostachys jatamansi are esteemed for their medicinal virtues as they possess the qualities of Bhutaghna and Manasa Doshahara, meaning they alleviate psychiatric issues. Additionally, they are considered Medhya, Rasayana (rejuvenative to the mind), Nidrajanana (promoters of sleep), Manasarogaghna(alleviators of mental diseases), Pachana (digestive), Kasa Shwasahara (alleviators of coughs and breathing difficulties), Kushtaghna (combatants against skin diseases and itching), Dahaprashamana (alleviators of burning sensations), Varnya (beneficial

for complexion), and Roma sanjanana (promoters of hair growth).

These roots and rhizomes are utilised in treating hysteria, epilepsy, convulsions, neurological disorders, insomnia, and cardiovascular issues. They contain a terpenoid ester, nardostachysin I, and have been shown to enhance learning and memory in mice and boost biogenic amine activity. Moreover, acetone extracts of N. jatamansi demonstrate significant inhibition of benzoyl peroxide-induced cutaneous oxidative stress, toxicity, and ear oedema in mice.[15]

ASHWAGANDHA (*WITHANIA SOMNIFERA*): THE GOLDEN ELIXIR OF AYURVEDA'S SWARNAPRASHANA

Ashwagandha is prominently recognised as one of the most utilised Rasayana herbs in Ayurveda. Clinically, it is employed for treating various conditions, including general debility, consumption, nervous exhaustion, insomnia, and memory loss. Its chemical composition comprises alkaloids (such as isopelletierine, ana ferine, cuseohygrine, and anahygrine), steroidal lactones (including withanolides and withaferins), and saponins.

Withania has demonstrated promising potential as an anticancer drug candidate due to its cytotoxic, apoptotic, anti-metastatic, antimitotic, and anti-angiogenesis properties. It has also shown efficacy in addressing a wide range of central nervous system (CNS) pathologies in rodents. These include catalepsy, cognitive and memory impairment, orofacial dyskinesia, stress, Parkinson's disease (PD), Huntington's disease (HD), Alzheimer's disease (AD), cerebral stroke, epilepsy, excitotoxicity, sleep disturbances, chronic fatigue syndrome, streptozotocin-induced oxidative stress, copper-induced oxidative stress, and rotenone-induced oxidative stress.[16]

PIPPALI (*PIPER LONGUM*): THE VERSATILE REMEDY IN AYURVEDA'S ARMAMENTARIUM

Pippali, also known as *Piper longum*, is one of the most extensively utilised medicines in Ayurveda, independently and in compound formulations. Renowned for its efficacy in treating conditions such as cough (Kasa), asthma (Shwasa), tuberculosis (Rajayakshma), arthritis, and gastrointestinal disorders, Pippali boasts a wide array of medicinal properties.

It is recognised for its immune-modulatory, antioxidant, anti-tubercular, anti-cancer, hepatoprotective, anticholesterolemic, anti-inflammatory, anti-amoebic, anti-asthmatic, antimicrobial, and anti-diabetic activities. Moreover, Pippali is highly esteemed for its role as a bioavailability enhancer, further accentuating its significance in Ayurvedic medicine.[17]

BRAHMI (*BACOPA MONNIERA*): UNVEILING ITS COGNITIVE ENHANCING POTENTIAL IN SWARNAPRASHAN

Bacopa monniera, commonly known as Brahmi, is a renowned nootropic plant celebrated for its tranquilising and sedative properties, as well as its cognitive enhancement, hepatoprotective, memory-enhancing, and antioxidant actions. Its neuroprotective effects are attributed to its ability to scavenge reactive oxygen species.

Rich in saponins, Bacopa monniera contains bacosides as its main active nootropic component, particularly in its alcoholic extract. Primarily utilised in treating memory and attention disorders, studies have also revealed its triterpenoid saponins to possess thyroid T4 hormone-stimulating activity in animals, albeit in high doses.[18]

DISCUSSION

Swarnamritaprashana is an herbal preparation intended for children. It is designed according to the principles of lehana and aims to enhance overall health, intellectual capacity, and immunity in particular. Each ingredient in Swarnamritaprashana has been validated for its specific effects through experimental and clinical research. Consequently, Swarnamritaprashana is suggested to provide the advantages of Swarnaprashana, as highlighted within the framework of Lehana. Swarnaprashana, a traditional Ayurvedic practice, is a highly effective natural solution for children's health and immunity. [(19)] Its formulation, enriched with Swarna Bhasma and nootropic plants like Brahmi, Shankhapushpi, and Yashtimadhu, aligns with Ayurvedic principles of

Medhya (cognitive enhancement) and Rasayana (rejuvenation). Scientific studies support these ingredients' immunomodulatory and neuroprotective properties, validating historical beliefs regarding improved intellect, immunity, and metabolic health. Furthermore, the adaptogenic properties of Ashwagandha and Guduchi contribute to stress resilience, which is increasingly necessary in today's competitive environment. **Using** a ghee base enhances the absorption of bioactive compounds, ensuring optimal drug effectiveness. While Swarnaprashana is gaining popularity, additional clinical trials are required to substantiate its benefits through evidence-based medicine. Given the rising concerns about childhood malnutrition, antibiotic resistance, and neurodevelopmental issues, integrating Swarnaprashana into paediatric healthcare may offer a complementary strategy for holistic child wellness, merging traditional wisdom with modern scientific knowledge.

CONCLUSION

Integrating Swarnaprashana, a traditional Ayurvedic practice, with modern healthcare approaches presents a promising avenue for enhancing immunity and promoting overall well-being in children. The immune actions of biodegradable and gold nanoparticles align closely, making them promising candidates for next-generation vaccines. Nonetheless, further clinical trials are necessary to elucidate the interaction of Swarnaprashana particles with human physiology.

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