

IMPORTANCE OF AYURVEDIC IMMUNIZATION IN PRESENT SCENARIO: EVIDENCES

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Abstract

Keywords: *Immunization, Immuno-modulatory, Lehana.*

Introduction: Although we can attribute many public health successes to vaccination, the future presents continued challenges. Despite advancement of medical technologies, diseases still remain for which researchers have been unable to find effective vaccines (such as HIV/AIDS, malaria etc.). Also, vaccines are disease specific and therefore lots of vaccines are required to prevent diseases as new bugs are concurrently emerging. Therefore this is the high time for a nation to encourage the traditional system of medicine which provides a potential mechanism for development of immunity in children. Ayurveda, the traditional system of medicine in India provides lots of Lehana drugs which are supposed to build up the immunity and strength in children.

Material and Methods: Various Ayurveda classics and studies published in journals related to Ayurveda Lehana are reviewed and analyzed.

Result: Analysis of classical references and various experimental studies shows that Ayurveda Lehana drugs possess immuno-modulatory, intellect promoting and nutritional properties. The purpose of Lehana is not only same as of modern vaccination to prevent disease but also building immunity, ensuring proper growth and development and improving overall health of the child.

Conclusion: Lehana can be administered in all children as prophylactic as it acts at the level of nutrition, metabolism, growth and development, physical strength and immunity.

Introduction

In recent few years India has attained impressive achievements in child survival. A fast decline in Infant mortality rate (IMR) of country has been observed. The IMR has dropped by an average rate of 4.56% per year over last five years. However, at the current pace, the country will miss the target to achieve the fourth Millennium Development Goal (MDG-4), which aims to reduce under-five mortality rate and IMR by two-thirds between 1990 and 2015.

Although we can attribute many public health successes to vaccination, the future presents continued challenges. Despite advancement of medical technologies, diseases still remain for which researchers have been unable to find effective vaccines (such as HIV/AIDS, malaria etc.). Further, the cost of vaccines is too high for poorer countries to afford. Also, vaccines are disease specific and therefore lots of vaccines are required to prevent diseases as new bugs are concurrently emerging. Therefore this is the high time for a nation to encourage the traditional system of medicine which provides a potential mechanism for development of immunity in children.

The principles of vaccines for improving the immunity was also described thousands of years ago in Ayurveda in the form of countless formulations for children and adults. "Lehana" (means intake of medicine by licking) is one such traditional special formulation, mentioned in Ayurveda classics that have been used to enhance growth & development by providing sufficient nutrition, promote health, complexion and strength (immunity), protecting from various infections along with improving intellect and speech (delayed milestone).

Aims And Objectives

To provide evidence based immune-modulatory drug for children to make them free from diseases and to ensure their proper growth & development.

Material And Methods

The materials were collected from the classical Ayurveda literatures and research journals. Search focused on various Lehana formulation for children for improving their immunity.

Various compound formulations of Lehana mentioned in classics

1. Kashyapa Samhita

Swarnprasana (administration of Gold Bhasma)- Pure gold (in small quantity) is rubbed in water on a clean stone & given with honey and ghrita, to the newborn result in promotion of health, ensures proper growth and development, provides complexion & strength (immunity), Panchgavyaghrita, Brahmighrita, Abhayaghrita, Samvardhanaghrita (effective in children with delayed milestones) (Kashyapa Samhita Sutrasthana, Lehaadhyaya, p.4-6).

2. AshtangaHridaya

Sarshvataghrita (enhance verbal ability, memory and intellectual enhancer and appetizer) (AstangaHridayaUttaratantra 1/45, p.885), combination of vacha (Acorus calamus) and swarnabhasma with honey and ghrita (body compactness, intellect, immunity and complexion enhancer)(AstangaHridayamUttaratantra 1/47, p.885) etc.

3. Sushruta Samhita

Described 4 recipes (containing gold) which provide general immunity, body resistance, helpful in growth & development & enhancing the intelligence (Sushruta Samhita Sharirsthana 10/72-74, p.84). These are: 1) Swarnbhasm with kustha (Saussurea lappa), vacha (Acorus calamus), madhu (honey) & ghrita. 2) Swarnbhasm with paste of brahmi (Bacopa monnieri), shankpushpi (Convolvulus pluricaulis), with honey & ghrita. 3) Swarnbhasm, arkpushpi (Pueraria tuberosa), vacha (Acorus calamus), honey & ghrita. 4) Swarnbhasm, kaidarya (Azadirachta indica), swetadurva (Cynodon dactylon), ghrita.

Clinical And Experimental Evidences

Various clinical and experimental studies document the immune enhancing effect of the Lehana drugs especially Swarnabhasm.

Immune Response- Study documents that both specific and nonspecific immune responses were modified in a positive manner in Swarnabhasma treated mice. Swarna bhasma showed a stimulatory effect on peritoneal macrophages, which may be helpful to fight against infections. It was estimated that macrophages achieved stimulation possibly due to presentation of the metal to cells in fine emulsified form. The increase in the serum IgG level in the Gold compound group shows the immunological response of the rats against the antigenic material. One more study showed that gold nanorods (GNRs) inhibit Respiratory syncytial virus (RSV) in HEp-2 cells and BALB/c mice by 82% and 56%, respectively. The RSV inhibition correlated with marked upregulated antiviral genes due to GNR mediated TLR, NOD-like receptor and RIG-I-like receptor signaling pathways. Transmission electron microscopy of lungs showed GNRs in the endocytotic vesicles and histological analyses indicated infiltration by neutrophils, eosinophils and monocytes correlating with clearance of RSV. Further, production of cytokines and chemokines in the lungs indicate recruitment of immune cells to counter RSV replication.

Antioxidant Activity-The antioxidant and restorative effects of SwarnaBhasma in rats have been demonstrated. Two antioxidant enzymes superoxide dismutase (SOD) and catalase were measured after oxidative insult with acetic acid in Swarnabhasma. Another study document that high aspect ratio Au nanorods can act as an effective antioxidant and antibacterial agent.

Growth and Development- Study of 120 children age group ranging from 0 to 12 years, proved that Swarnaprashana therapy significantly improve weight in both male and female children. It also affects overall body development process. Swarnaprashana as trial drug and Madhujala as placebo was administered in children of trial group and control group respectively, for 14 times in duration of 1 year. Growth parameter weight and height was assessed on every visit of children. It is found that Swarnaprashana showed significant ($p < 0.05$) improvement in weight gain. Swarna is Sheet(cold) in Virya, Madhura (sweet) in Vipak and Madhur (sweet), Tikta (bitter), Kashaya (astringent) in rasa. It provides Bala (strength) to the body. It shows brumhanakarma (bulk promoting action), which is expected here, with the help of Madhur rasa and Madhur vipaka increase in the Rasadidhatu (tissues) is possible and occurs gradually.

Effect on Brain functions- Gold reduces the effects of depression, as well as enhances the ability to focus . Gold can have a balancing and harmonizing effect on the body particularly with regard to unstable mental and emotional states, such as depression. It is believed that the nanometer sized particles in colloidal Gold affect the electrical charges that are produced in neurons. It enhances the normal synaptic communication that takes place between the nerve cells. This enhancement is believed to be responsible for increased brain functions.

Safety of Gold compounds: Acute oral administration (continuous for 8 weeks on albino mice; 10 mg/20g b.w./day) of Swarnabhasma had not reported any toxic effects as assessed by liver function tests and histological investigations .

Discussion

Though National Immunization Schedule is implemented, mortality rate in India is still high. From the first day of life vaccination schedule is started but these all vaccines are not able to protect the child from the diseases like major bacterial infections, viral infections and primary-secondary immunodeficiency syndromes are not preventable by specific vaccines. The vaccine takes almost, few months for activation of immune system and to produce the specific immunoglobulins against that specific antigen. Recent immunization data shows that vaccinations and immunization schedules are not sufficient to control the diseases. So these are the major lacunas that lead to increase in postnatal infections, hence it is the need of the country to make available an immunomodulatory agent which boost up overall the immune system of body and helps to protect children from recurrent infections. It should be palatable to child and cost convenient so that it will be affordable to all type of socio-economic classes. In Gold preparations nano particles of Swarna can also be absorbed directly into the blood stream through sublingual route. Lehana can be administered in all children as it acts at the level of nutrition, metabolism, growth and development, physical strength and immunity .

Ancient Indians used different Lehana preparations for Swarnaprashana. Gold nano particles are capable of encapsulating active drugs and targeting. This proves the Yogavahi (Bioavailability enhancing) property of Swarna. This nano-technology has been used in treatment of brain malignancy. It is believed that the nanometer sized particles in colloidal Gold affect the electrical charges that are produced in neurons. It enhances the normal synaptic communication that takes place between the nerve cells. This enhancement is believed to be responsible for increased brain functions. The clinical study has been going on etherium Gold (Monatomic White Gold) which increases the amplitude of alpha waves in the brain. Alpha brain waves are associated with greater intelligence, enhanced creativity and learning ability, improved mind/body coordination .

The ancient Ayurvedic text ‘Rasa-Jala- Nidhi’ states: “Gold is soothing, pure, nutritive, curer of poison, phthisis, insanity and other diseases. Gold improves vitality, fortune, beauty, intelligence and memory .

Swarnaprashan or the Lehana are believed to be the first immunization given immediately after birth even before umbilical cord was cut and the baby was breast-fed by the mother. Swarnabhasm (nano particles) was rubbed with

honey and ghee and given to the baby to lick. This has been regarded to as to increase immunity (against bacterial as well as viral infections), boost Intelligence, digestive fire & physical strength in the children

Kasyapa, Sushruta and Vagbhata describe a special formulation by the name of Lehana for this purpose which enhances immunity and thus minimizes infection episodes, from the childhood period. While describing the benefits of Swarna Lehan, Kashyap opines that, by feeding the gold for one month, the child is not attacked by any disease. This classical description implicates that ingestion of Swarna modulates immune mechanism, so that morbidity is reduced. Also Swarnaprashan is cost effective putting low economic burden on the country.

Mode of Action of Swarnaprashana yoga: Vacha (*Acorus calamus*) is Medhya (intellect promoting) and possesses, Neuroprotective properties. Ghee has Medhya (intellect promoting), Oja-Teja-Bala-Ayushya Vriddhikar (provides vitality, lustre, strength and longevity), Vrishya (aphrodisiac), Rakshoghna (Immunostimulant activity). Further, Ghee acts as natural source of the fat soluble vitamins (Vit. A, D, K), traces of Fe, P, Cu, β carotene. SwarnaBhasma is Vrushya (aphrodisiac), Ayushaya (provides longevity), Balya (provides strength and immunity), Bruhana (anabolic), Ojowardhana (increases vitality), Sarvavishapaham (antitoxin), Garaharam (antitoxin). Madhu (Honey) contains antigenic material – ‘Pollens. All these drugs are mixed together to produce an emulsified mixture like small fat globulins-chylomicrons which helps in absorption through the oral mucosa. Small quantities fatty acids are absorbed directly into the portal blood rather than being converted into triglycerides and absorbed by lymphatics and intestinal epithelial cells allows direct diffusion into the capillary blood of the intestinal villa. Antigens in the honey are taken up by dendritic cells which interact with T lymphocyte striggering the Immunological response and body produces antibodies against antigen. Some drugs cross the Blood Brain Barriers and gives Medhya (intellect promoting) effect.

Conclusion

Pharmacological and clinical trials on Swarnabhasma proved that it helps to build immunity and cognition in children. Toxicological studies reveals that classical preparations are safe for long time use. Modern researches on gold and gold compounds also support the Swarnaprashana concept of Ayurveda. So there is need of today to update the current immunization schedule with Lehana in child. Lehana can be administered in all children as prophylactic as it acts at the level of nutrition, metabolism, growth and development, physical strength and immunity. The purpose of Lehana is not only same as of modern vaccination to prevent disease but also building immunity, ensuring proper growth and development and improving overall health of the child. So there is need of today to implicate Swarnaprashan in National Immunization Programme along with vaccination.

References

1. Pandit Hemraj Sharma, Satyapala Bhisagacharya. *Kasyapa Samhita*. Varanasi: Chaukhamba Sanskrit Sansthan; 2006.
2. Brahmanand Tripathi. *Astanga Hrdayam (Nirmala Hindi Commentary)*. New Delhi: Chaukhamba Sanskrit Pratishthan; 2009.
3. Brahmanand Tripathi. *Astanga Hrdayam (Nirmala Hindi Commentary)*. New Delhi: Chaukhamba Sanskrit Pratishthan; 2009.
4. Kaviraj Ambikadutta Shastri. *Susruta Samhita (Ayurveda Tattva Sandipika Hindi commentary)*, Part-I. Varanasi: Chaukhamba Sanskrit Sansthan; 2005.
5. Bajaj, S., Ahmad, I., Fatima, M., Raisuddin, S., and Vohora, S.B., *Immunomodulatory activity of a Unani gold preparations used in Indian system of medicine, Immunopharmacol. Immunotoxicol.*, 21, 151, 1999.
6. Gaikwad A S, Patel KS, Rajgopala S. 'A Pharmaco-Clinical study of the effect of Madhu-Ghrita and swarna- vacha-Madhu-Ghrita on Neonates. 2009-2011. PG Dissertation work.
7. Bawage SS, Tiwari PM, Singh A, Dixit S, Pillai SR, Dennis VA, Singh SR. Gold nanorods inhibit respiratory syncytial virus by stimulating the innate immune response. *Nanomedicine*. 2016 Jul 2:12(8);2299-2310

8. K Hashimoto, C E Whitehurst, T Matsubara, K Hirohata, and P E Lipsky. 'Immunomodulatory effects of therapeutic gold compounds'. *J Clin Invest.* 1992 June; 89(6): 1839–1848.
9. Shyamalima Sharma, Ajay Kumar Manhar, Pritom Jyotibora, Swapan kumar Dolui, Manabendra Mandal. Evaluation of antioxidant and antibacterial activity of various aspect ratio gold (Au) nanorods. *Adv. Mater. Lett.* 2015, 6(3): 235-241.
10. Ramteke R D, et.al. To Study the effect of SwarnaPrashan on Physical Growth Parameters of Weight and Height in Children. *International Journal of Ayurvedic Medicine*, 2014, 5 (3), 269-277
11. Abraham, Guy E., Souhaila A. McReynolds, and Joel S. Dill. "Colloidal Gold Information." 21. Abraham, Guy E., Souhaila A. McReynolds, and Joel S. Dill. "Effect of colloidal metallic gold on cognitive functions: A pilot study." *Frontier Perspectives* 7.2 (1998): 39-41.
12. Mitra A, Chakraborty S, Auddy B, Tripathi T, Sen S, Saha AV, et al. Evaluation of chemical constituents and free-radical scavenging activity of Swarnabhasma (gold ash), an Ayurvedic drug. *J Ethnopharmacol* 2002;80:147-53
13. Gulhane et al. Scientific View towards Suvarnaprashanain Alternative Medicines *Int J Ayu Pharm Chem.* 2015 Vol. 3 Issue 3,128-137.
14. Mitra, A., et al. "Evaluation of chemical constituents and free-radical scavenging activity of Swarnabhasma (gold ash), an Ayurvedic drug." *Journal of ethnopharmacology* 80.2 (2002): 147-153.
15. Mookerji, Kaviraj Bhudeb [Translator]: *Rasa-Jala-Nidhi or Ocean of Indian Chemistry & Alchemy*, vol. 2, Delhi 1990, Parimal publ., p. 239f
16. Pandit Hemraj Sharma, Satyapala Bhisagacharya. *Kasyapa Samhita*. Varanasi: Chaukhambha Sanskrit Sansthan; 2006 .
17. Shukla PK, Khanna VK, Ali MM, Mourya RR, Handa SS, Srimal RC. Protective effect of *Acorus calamus* against acrylamide induced neurotoxicity. *Phytother Res.* 2002 May; 16(3): 256-60.