



AYURVEDIC NUTRACEUTICAL: AN INTRICATE PATHWAY TO A HEALTHY PROGENY?

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Abstract:

INTRODUCTION

We live in a fast-paced world where expenditure is rocketing sky-high and people are running to meet two ends. Here every millisecond counts and we have no time to spend for even having a meal. Even the richest households in India do not consume adequate amounts of fruits, vegetables and non-cereal proteins in their diets. Forget about the common man, even pregnant women have started neglecting their health by making time, money and circumstances as the culprit.

MATERIALS AND METHODS

Ayurveda discusses various ways through which how a pregnancy can be maintained healthy starting from preconceptional care to post-partum care in the special section of 'Prasooti tantra'. Classical texts have advised on not only the treatments during the pregnancy but also on foods and regimens to be followed for maintaining a healthy pregnancy. Acharya Caraka describes ten medicinal herbs that can help in the well-being of both the pregnant mother and the foetus. They are *Bacopa monnieri* (L.) Pennell, *Centella asiatica* (L.) Urban, *Asparagus racemosus* Willd., *Asparagus sarmentosus* Linn., *Stereospermum sauevolens* DC, *Tinospora cordifolia* (Willd.) Hook.f. and Thoms., *Terminalia chebula* Retz., *Picrorhiza kurroa* Royle ex Benth., *Sida cordifolia* Linn. and *Callicarpa macrophylla* Vahl. These have phyto-chemicals like brahmoside, triterpinoids, thankunside, cytokinins, anthroquinone derivatives, myrobalan, Vitamin A, B1, B2, C, E, K, magnesium, calcium, iron, anti-oxidants which makes this formulation neuroprotective, galactogogue, anti-abortion, anti-coagulant, anti-glycemic, anti-aneamic, anti-ulcerative, analgesic and immunomodulator. It is to be taken by cooking with milk. The encapsulating action of liposomes present in the milk might help the pregnant women in meeting the daily needs of nutrition thus helping in an enhanced and effective drug delivery to the body.

CONCLUSION

In future, this as a whole or by extracting its active principles can be developed as an exclusive cost-friendly nutraceutical for pregnant women after proper preclinical and clinical studies.

Keywords: Nutraceuticals, Ayurveda, *Garbhasthapana*, Pregnancy, Nutrition

1. Introduction

The world today is struggling to stay healthy amidst all the odds of provocations in the name of Junk foods and fast foods. When some spends their time and money in enjoying the foods, very less population focuses on maintaining their body as healthy compared to the former. The recent Covid-19 scenario made waves of transformation in the lives of both developing and developed countries to how to stay healthy rather than focusing on how to treat a disease. Other than the geriatrics and paediatrics section of society, the whole of the world were more concerned about the pregnant women. Most of them couldn't even step out of their houses even to consult the obstetricians in the fear of the pandemic. Survey studies shows that they also had a dilemma about their daily diet during the situation. The Nutraceuticals can be a one-word solution to such circumstances. The term "Nutraceuticals" was defined by Stephen L. DeFelice, founder and chairman of the Foundation for Innovation in Medicine (Crawford, Ny, USA, 1989), by combining the words "nutrition" and "pharmaceuticals"[1]. Nutraceuticals are phytocomplexes when derived from plant origin food or a pool of secondary metabolites when derived from animal origin food, which are concentrated and administered in more suitable pharmaceutical form, being capable of providing beneficial health effects, including prevention and/or treatment of a disease [2]. Ayurveda is a science which deals with both the preventive and curative aspects of diseases. In the classical text *Caraka Samhita*, *Acharya Caraka* has classified drugs under the name '*Garbhasthapana dravya*' [3]. In another context *Acharya Caraka* quotes the same drugs as '*Prajasthapana gana*' [4]. Ten drugs are described under this title, which helps in the proper maintenance of health of both foetus and pregnant women. These if made into a nutraceutical can benefit a lot in leading a healthy pregnancy.

2. Materials and Methods

The classical texts of Ayurveda focuses mainly on plant origin drugs as medicines and as Nutraceuticals. Though they do not mention the formulations under the heading of Nutraceuticals, *Acharya* have given each scholars the freedom to modify them without causing any harm to the patient who consumes it. The word '*Garbhasthapana*' is made of two other words '*Garbha*' meaning pregnancy and '*Sthapana*' meaning to get established which as a whole meaning, that which helps for the proper establishment of pregnancy. The *Garbhasthapana gana* consists of 10 drugs. They are *Aindi*, *Brahmi*, *Sataveerya*, *Sahasraveerya*, *Amokha*, *Avyadha*, *Siva*, *Arishta*, *Vatyapushpi* and *Vishwaksenakantha* (as per the Sanskrit names).

Table 1. Names of the plants in Garbhasthapana gana

Sanskrit names	Botanical names
<i>Aindri</i>	<i>Bacopa monnieri</i> (L.) Pennell
<i>Brahmi</i>	<i>Centella asiatica</i> (L.) Urban
<i>Sataveerya</i>	<i>Asparagus racemosus</i> Willd.
<i>Sahasraveerya</i>	<i>Asparagus sarmentosus</i> Linn.
<i>Amokha</i>	<i>Stereospermum sauveolens</i> DC
<i>Avyadha</i>	<i>Tinospora cordifolia</i> (Willd.) Hook.f. and Thoms.
<i>Siva</i>	<i>Terminalia chebula</i> Retz.
<i>Arishta</i>	<i>Picrorhiza kurroa</i> Royle ex Benth.
<i>Vatyapushpi</i>	<i>Sida cordifolia</i> Linn.
<i>Vishwaksenakantha</i>	<i>Callicarpa macrophylla</i> Vahl.



(a)



(b)



(c)



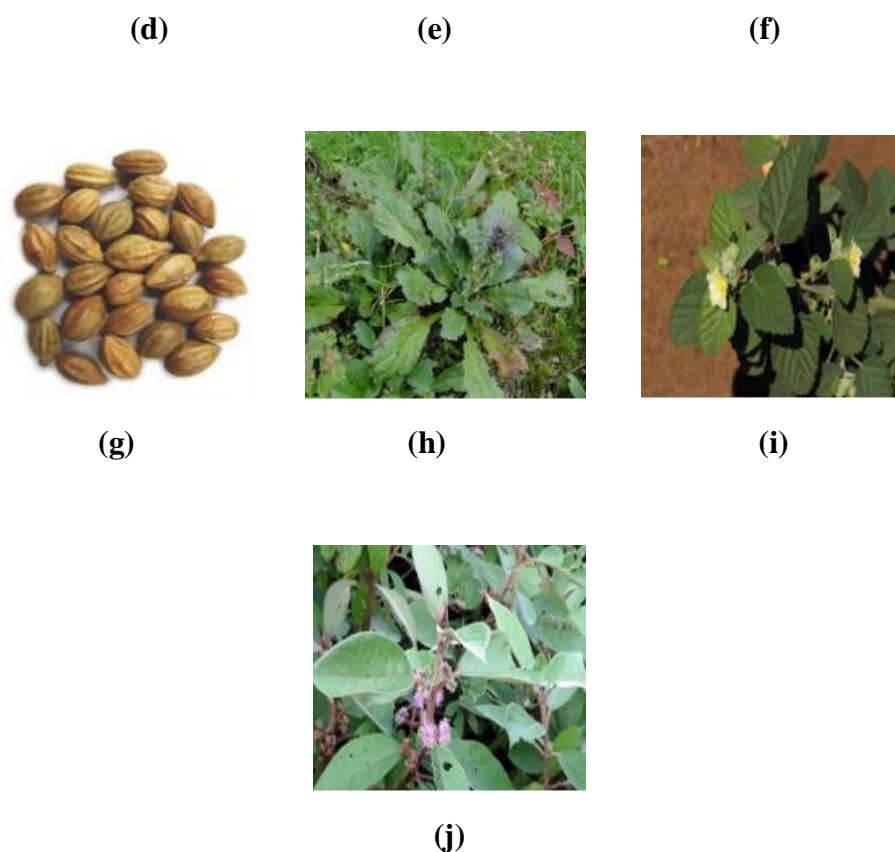


Figure 1. (a) Bacopa monnieri (L.) Pennell (b) Centella asiatica (L.) Urban (c) Asparagus racemosus Willd. (d) Asparagus sarmentosus Linn. (e) Stereospermum sauveolens DC (f) Tinospora cordifolia (Willd.)Hook.f. and Thoms. (g) Terminalia chebula Retz. (h) Picrorhiza kurroa Royle ex Benth. (i) Sida cordifolia Linn. (j) Callicarpa macrophylla Vahl.

3. Possible mode of action

3.1 Review of each plant

Bacopa monnieri (L.) Pennell

Ascorbic acid, Nicotinic acid, Brahmine, Herpsestinine, Alanine present in this plant, acts as Neuroprotective antioxidant and also is neurogenerative. Their activities are mainly focused on the hippocampus and frontal lobes and ultimately can help in the brain development of the foetus and also help in controlling postpartum depression[5].

Centella asiatica (L.) Urban

Brahmoside and Brahminoside have actions related to CNS of the foetus and the pregnant women which is yet to be confirmed through clinical studies.

Centelloside and its derivatives also help in reducing venous hypertension which is commonly seen in pregnant women along with varicose veins [6].

Asparagus racemosus Willd.

Glycosides, alkaloids, polysaccharides, mucilage, racemosol and isoflavones improve stress-mediated reproductive health complications due to the anti-oxidant ability in women. From the animal studies, Anti-abortion and anti-coagulant activities are also elicited. It also acts as a galactagogue which is an essential factor in an expecting mother. It is abundant in Vitamin E which boosts the body's immunity and prevents viral infections which is very evident in this Covid-19 scenario [7].

Asparagus sarmentosus Linn.

The phytochemicals present in this plant act at the level of immune system. It is also rich in folic acid which is critical for the neural development of foetus. Satavarin and Steroidal saponins increase prolactin. Calcium present in this plant helps in the proper bone formation of the foetus in terms of structure and density. Vitamin E present in this improves the health of mother along with vitality and also prevents neural tube defects in babies [8].

Stereospermum sauveolens DC

Animal studies showed that this plant is anti-glycemic in samples having Gestational Diabetes Mellitus and also has the capacity to decrease the elevated levels of Serum Glutamate, Oxaloacetate transaminase, Serum glutamate pyruvate transaminase, Serum alkaline phosphatase, Bilirubin, Creatinine, urea and total cholesterol [9].

Tinospora cordifolia (Willd.)Hook.f. and Thoms

It helps in the reduction of oxidative stress arising on the maternal and foetal body when the mother is diabetic. It is also anti-fungal, anti-inflammatory and anti-pyretic which can prevent the pregnant lady from the attack of several bacterial and viral diseases [10].

Terminalia chebula Retz.

Saponins, Anthroquinone derivatives and flavonoids and tannins help to evacuate the Phlegmatic excreta from the brain by preventing the stomach vapours from ascending into the brain. It also acts as a tonic for stomach and liver. It also helps to decrease anaemia and pallor.

Myrobalan present in it is anti-ulcerative at the level of gastric mucosa which acts as a saviour to women with hyper emesis gravidarum [11].

Picrorhiza kurroa Royle ex Benth.

Several studies have shown that it is hepatoprotective thus preventing the severe pruritus seen during pregnancy. It also has Immuno-modulation activity, is anticholestatic and is also an Anti-oxidant [12].

Sida cordifolia Linn.

This helps in curing Urinary Tract Infections and excessive Leucorrhoea seen in pregnant women. It also helps in relieving the muscle cramps and nerve pain experienced by them [13].

Callicarpa macrophylla Vahl.

Amyrin, Beta Sitosterol present in this plant helps in the proper maintenance of pregnancy[14].

4. Discussion

The above plants, said in classical reference throws light to the fact that it helps in maintaining a healthy pregnancy and also improves the overall immunity and health of the Pregnant woman thus helping to reduce the rate of infections which can interfere with the pregnancy. Most of the components present in this combination of drugs are having lipophilic action. These drugs if made into a nutraceutical in the form of powder to be taken daily along with milk, as per advised in the classics might help the pregnant women in meeting the daily needs of nutrition, by the encapsulating action of liposomes and thus helping in an enhanced and effective drug delivery to the body.[15]

PROPOSED PROTOCOL FOR DEVELOPING A NUTRACEUTICAL WITH GARBHASTHAPANA DRAVYA

Raw materials are collected from certified pharmacy. The crude drugs and its botanical name are verified.

Method of preparation of Decoction

Coarse drugs are mixed with 16 times water and reduced to 1/4th of the initial quantity by subjecting to mild heat. After the achievement of desired volume the decoction is filtered collected into a separate vessel.

Method of preparation of Granules

Freshly prepared decoction is taken further boiled. Reduction is done up to semisolid At that time the above said drugs turned into fine powder is added and granules are prepared and passed through sieve (# 20). It is then dried at room temperature and oven dried at 60^o C. Then it is packed in an air tight container.

Method of preparation of Dipping Bag for Instant use

The required amount of prepared granules are taken and kept in heat-sealed filter cloth of 12 x 4cm size. Then the cloth is folded and sealed with a heat sealing machine at 65^o C. Afterwards, a cotton thread of 12 cm in length is attached for holding the bag and a unique shape is given by folding.

Analytical Study

All the preparations are to be analysed through different analytical parameters. Organoleptic characteristics like colour, odour, taste, and touch must be documented. Physicochemical investigations like pH, Total solid content, Specific gravity, Viscosity, Loss on drying, Ash value, water and methanol soluble extractives and Refractive Index must be carried out. They must also be checked for microbial overload and high-performance thin layer chromatography (HPTLC) studies.

5. Conclusion

It is the need of the current scenario to develop a nutraceutical that contains fewer chemicals. Survey studies have shown that the marketed samples of most food products and Nutraceuticals contain chemical compounds whose action is yet to be found. The nutraceutical that abides by the rules of pharmaceutical development and also depends solely upon the Ayurvedic classical texts can definitely be a solution to this problem. Moreover development of a healthy progeny in the mother's womb with the help of natural herbs is in fact an asset to this system of medicine.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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