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CRITICAL APPRAISAL OF GARBHASTHAPANA DRAVYAS MENTIONED IN BHAVA PRAKASHA NIGHANTU

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ABSTRACT

Infertility and high-risk pregnancy are two major health problems that come across in female reproductive age. Conceiving a healthy pregnancy is a very challenging event for a woman. The concepts of *Garbha Sharira, Garbha Sambhava Samagri, Masanumasika Garbhini Paricharya, Garbhopaghatakar Bhavas, and Garbhavyapat* have been elaborately described in Ayurveda classics, all these concepts play a major role in the maintenance of healthy pregnancy and delivering healthy progeny. Ayurveda *Acharyas* have defined *Garbhasthapana* action as that which removes all the abnormalities in the reproductive system that cause obstacles in conception and also helps to remove the disorders in the foetus for the sustenance of pregnancy. In the present study, the *Dravyas* having *Garbhasthapana* Karma were screened from the *Bhavaprakasha Nighantu*, out of 426 drugs, 18 drugs found to have Garbhasthapana Karma. Critical analysis of the drugs were done on the basis of Rasa Panchakas, its relevance in Brihatrayees and the latest research studies done on them. It was observed that most of the drugs have *Madhura Rasa* and *Madhura Vipaka, Sheeta Veerya, Guru Guna and Vata Pittahara and Kaphakara properties.* In Brihatrayees innumerable references have been dealt on the Garbhasthapana drugs mentioned in Bhavaprakasha Nighantu. A very few research studies have been done on the drugs like *Shatavari, Yashtimadhu, Putranjiva,* but the implied ability of other drugs were unexplored and it is the need of the hour to do more research studies to understand the mode of action of different drugs acting as Garbhasthapana in different dimensions.

KEYWORDS: *Garbhasthapana*, *Garbhakarini*, Infertility, High risk pregnancy, Bhavaprakasha Nighantu.

INTRODUCTION

Infertility affects up to 15% of reproductive-aged couples. It is a global health issue affecting millions of people of reproductive age worldwide.[1] On the other hand, high-risk pregnancy is more evident in infertility-treated cases and is also seen in naturally conceived cases as well. In India about 20-30% pregnancies belong to high risk category, which is responsible for 75% of perinatal morbidity and mortality.[2] In present modern life, issues with fertility and complications during pregnancy are more evident. There are reports of deteriorating reproductive health indices since the last 5–6 decades ago from different parts of the world as a result of unhealthy lifestyle factors.[3] Hence it is very much essential to review the drugs which acts on reproductive system, to optimise chances of obtaining conception and sustenance of healthy pregnancy.

Infertility

Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse. Primary infertility is the inability to have any pregnancy, while secondary infertility is the inability to have a pregnancy after previously successful conception.[4]

The most common identifiable factors of female infertility are as follows.[5]

- Ovulatory disorders - 25%
- Endometriosis - 15%
- Pelvic adhesions - 12%
- Tubal blockage - 11%
- Other tubal/uterine abnormalities - 11%
- Hyperprolactinemia - 7%

A high-risk pregnancy is defined as one complicated by a factor or factors adversely affecting the pregnancy outcome (maternal, perinatal, or both). Factors to be considered include age, parity, social class, history of chronic disease (diabetes mellitus, hypertension, heart disease, thyroid disease, etc.), history of previous pregnancy complications, and multiple previous pregnancies. Hence, regular Ante natal care should be done to identify high-risk pregnancies

at an early stage and manage any pregnancy-related complications to ensure acceptable maternal and perinatal outcomes.[6]

Garbha sambhava samagri—Ritu, Kshetra, Ambu, and Beeja—are the essential components of conception.[7] *Ritu* is considered as *Garbhadhan yogya kala* (appropriate age of man and woman for conception); another instance of *Ritu* is *Ritukala,* which is the ovulatory phase. *Kshetra,* the entire reproductive system of females, can be inferred; Ambu, the nutrients for foetal growth; and *Beeja* (male and female gametes). Defects in these factors lead to problems in conception or in the sustenance of pregnancy. In *Bhavaprakash Nighantu,* some drugs are very specifically mentioned to have *Garbhasthapana, Garbhaprada, Garbhakarini,* and *Putrada Karma,* which can be understood that these drugs act on *Garbha Sambhava Samagri,* which are the essential factors in conception and in the sustenance of pregnancy.

Bhavaprakash Nighantu is one of the best-known *Nighantu*, composed by *Shri Bhavamishra* in the 16th AD, with detailed descriptions of the plants with their synonyms, properties, and therapeutic indications. The text was selected to find out the drugs having the *Garbhasthapana properties* and critically analysed the drugs based on *Rasapanchakas*, its references in Brihatrayees and recent research profiles.

MATERIALS AND METHODS

Bhavaprakasha Nighantu of Acharya Bhavamishra, translated to Hindi by Dr. K C Chunekar was selected as the reference for the review. In this review all the Vargas of the Nighantu where the drugs having the Garbhasthapana / Garbhada / Putrajada / Garbhakarini / Garbhakara karma were searched and listed. The listed drugs botanical and family source, Guna Karma and part used were tabulated.

OBSERVATION AND RESULTS

It has been observed that 18 drugs having Garbhasthapana / Garbhakarini / Garbhada / Putrada/ Garbhakara as Karma were found and list of the following herbs are enlisted below in the tabulated form.

Table 1: showing list of drugs with botanical and family sources and its properties.

Sl. no	Drug	Botanical name	Family	Rasa	Guna	Veerya	Vipaka	Part used	Doshaghnata	Karma
1	*Padmakha*	*Prunus puddum* Roxb. ex Wall	Rosaceae	*Tikta, Kashaya*	*Laghu*	*Sheeta*	*Katu*	*Kaanda*	*Vata janaka Pitta Kapha hara*	*Garbha sthapana*
2	*Gorochana*	*Bezoar*	-	*Tikta*	-	*Sheeta*	-	Bezoar	-	*Garbha sravahrut*
3	*Shweta Kantakari*	*Solanum xanthocarpum* Schard &Wendl	Solanaceae	*Tikta, Katu*	*Laghu Ruksha*	*Ushna*	*Katu*	*Mula*	*Kapha Vata hara*	*Garbha karini*
4	*Jeevaka*	*Microstylis wallichii* D. Don	Orchidaceae	*Madhura*	*Guru*	*Sheeta*	*Madhura*	*Kanda*	*Pitta Vata hara, Kapha kara*	*Garbha prada*
5	*Rushbhak*	*Microstylis musifera* Ridley	Orchidaceae	*Madhura*	*Guru*	*Sheeta*	*Madhura*	*Kanda*	*Pitta Vata hara, Kapha kara*	*Garbha prada*
6	*Medha*	*Polygonatum verticillatum* L.	Aliaceae / Asparagaceae	*Madhura*	*Guru*	*Sheeta*	*Madhura*	*Kanda*	*Pitta Vata hara, Kapha kara*	*Garbha prada*
7	*Maha medha*	*Polygonatum cirrhifolium* Royle	Aliaceae / Asparagaceae	*Madhura*	*Guru*	*Sheeta*	*Madhura*	*Kanda*	*Pitta Vata hara, Kapha kara*	*Garbha prada*
8	*Kakoli*	*Roscoca procera* Smith	zingiberaceae	*Madhura*	*Guru*	*Sheeta*	*Madhura*	*Kanda*	*Pitta Vata hara*	*Garbha prada*
9	*Ksheera kakoli*	*Lilium polyphyllum* D. Don	zingiberaceae	*Madhura*	*Guru*	*Sheeta*	*Madhura*	*Kanda*	*Pitta Vata hara*	*Garbha prada*
10	*Mudga parni*	*Phaseolus trilobus* L.	Fabaceae	*Tikta, Madhura*	*Laghu Ruksha*	*Sheeta*	*Madhura*	*Pancha nga*	*Tridosha hara*	*Garbha prada*
11	*Masha parni*	*Teramnus labialis* L.F Spreng	Fabaceae	*Tikta, Madhura*	*Ruksha*	*Sheeta*	*Madhura*	*Pancha nga*	*Kapha vardhaka Vata-Pitta Shamaka*	*Garbha prada*
12	*Jeevanti*	*Leptadenia reticulate* Retz	Asclepiadaceae	*Madhura*	*Laghu Snigdha*	*Sheeta*	*Madhura*	*Pancha nga*	*Tridosha hara*	*Garbha prada*
13	*Madhuka*	*Glycirrhiza glabra* Linn.	Leguminaceae	*Madhura*	*Guru Susnigdha*	*Sheeta*	*Madhura*	*Mula*	*Pitta Vata hara*	*Garbha prada*
14	*Vruddhi*	*Habenaria intermedia* D.Don	Orchidaceae	*Madhura*	*Guru*	*Sheeta*	*Madhura*	*Kanda*	*Tridosha hara*	*Garbha prada*

15	*Ridhi*	*Habenaria acuminate* Lindl	Orchidaceae	*Madhura*	*Guru*	*Sheeta*	*Madhura*	*Kanda*	*Tridosha hara*	*Garbha prada*
16	*Lakshmana*	*Ipomoea sepiaria* Koen	Convolvulaceae	-	-	-	-	*Mula*	*Tridosha hara*	*Putrada*
17	*Dugdhika*	*Euphorbia hirta* Linn.	Euphorbiaceae	*Tikta*	*Guru Ruksha*	*Ushna*	*Katu*	*Pancha nga*	*Vatakara, Kaphahara*	*Garbha karini*
18	*Putrajeeva*	*Putranjiva roxburghii* Wall.	Euphorbiaceae	*Madhura Katu Lavana*	*Guru Rukhsha*	*Sheeta*	*Madhura*	*Beeja*	*Kapha Vata hara*	*Garbhada*

From the list of table it was observed that 18 drugs have been mentioned to have Garbhakarini / Garbhada / Putrada / Garbhasthapana action. Most of the drugs have *Madhura* Rasa and Madhura Vipaka, Sheeta Veerya, Guru Guna, but there are some exception to the drugs like *Dugdhika, Shweta Kantakari, Lakshmana and Putranjeev* have Katu Rasa, Lavana Rasa, Ushna Veerya and Katu Vipaka.

Enumeration of drugs with recent research profile

Shweta Kantakari

Solanum xanthocarpum Schard & Wendl. is having immense importance in Ayurveda, it is key ingredient to important formulations. In an experimental study in Wistar rats, oral administration of different doses of Solanum xanthocarpum extract showed significant improvement in all the parameters of sexual behaviour, caused vaginal cornification, and increased serum estradiol and uterine weight, as serum estradiol plays an important role in oocytes/follicular maturation and preparation of the uterus for implantation.[8,9]

Padmaakh

Prunus puddum, usually called as the Himalayan cherry tree, with a significant ethno-botanical and therapeutic importance, its stem / wood is used as anti abortifacient. It contains high levels of flavones and isoflavones and may be potential sources of phytoestrogens present in it. In an experimental study, Prunus puddum extract was evaluated for its in vivo uterotrophic effects in immature female rats as well as for its lipid lowering effects in estrogen deprived animals. The results showed drug to have strong estrogenic activities and a major sources of phytoestrogens.[10, 11]

Shatavari

Shatavari is the main Ayurvedic rejuvenative tonic for the female. In spite of being a rejuvenating herb it is beneficial in infertility, as it increases libido, cures inflammation of reproductive organs, enhances folliculogenesis and ovulation, prepares womb for conception, prevents miscarriages, acts as post-partum tonic by increasing lactation, normalizing uterus and changing hormones. *A.racemosus* comprises phytoestrogens, particularly Shatavarin IV and Rutin which are isoflavanoid compounds. In an experimental study, ethyl acetate and acetone extract of the root of *A. racemosus*, inhibited contraction induced by spasmogens like acetylcholine, barium chloride and 5- hydroxytryptamine. A glycoside, Shatavarin 1, isolated from the roots of *A. racemosus* has been found to be responsible for the competitive block of oxytocin induced contraction of rat, guinea pig and rabbits uteri, *in vitro* as well as *in vivo studies.*[12]

In another study, female Sprague dawley rats administration of Rutin orally treated groups showed better antioxidant and lipid profiles as compared with PCOS groups. Histopathological examination of ovary revealed a significant decrease in the number of cystic follicles in treated groups. The effects observed with Rutin were moderately similar to that with standard metformin, a widely used treatment drug for PCOS.[13]

Yashtimadhu

It contains high amounts of phytoestrogenic compounds, liquiritigenin was found to be the principle phytoestrogen of the licorice extracts. This plant found to be beneficial in treating estrogen-dependent diseases such as breast cancer, endometriosis, PCOS and Premature ovarian failure. Studies show that licorice inhibits two enzymes [3β-hydroxysteroid dehydrogenase (3HSD) and 17-hydroxysteroid dehydrogenase (17HSD)], stimulates the activity of aromatase, and also affects the activity of 5α- and 5β-reductase enzymes, all of

which are involved in the synthesis and metabolism of androgens and estrogens. Due to the presence of phytoestrogens with aromatase-inducing and 17HSD-inhibiting activities, licorice can reduce testosterone synthesis and therefore can be used to treat women with PCOS. In addition,[14] according to a study on PCOS-induced mice, licorice extract was shown to improve ovarian morphology, oocyte maturation and embryonic development.[15]

Putranjiva

Putranjiva roxburghii, is a very famous drug for its usage in male and female infertility. In a study, male and female zebrafish extracts from the P. roxburghii seeds were used to reverse fertility impairment. Treatment with P. roxburghii seed oil, increased the ovarian follicle count as well as the number of mature eggs, while reducing the number of ovarian cysts. Sperm count as well as sperm motility were greatly enhanced in the ENU-mutagenized male zebrafish. The results obtained in the study demonstrate the effectiveness of P. roxburghii seed oil in reversing impaired fertility in both male and female zebra fish models.[16]

DISCUSSION

18 drugs were enlisted in the table, these may help to regulate the body's metabolism, purify reproductive organs, regulate hormonal balance, enhances endometrial lining and receptivity, establish ovulation. *Ashtavarga dravyas* are not easily available due to their habitat in Himalaya region and genuinity of the sources due to its extinction, so their *Pratinidhis* can be considered. Most of the drugs have *Madhura rasa and Madhura Vipaka*, Sheeta Veerya, Guru Guna, but there are some exception to the drugs like *Dugdhika, Shweta Kantakari and Putranjeeva* having Garbhasthapana Karma even though they have Katu rasa, lavana rasa, Ushna Veerya and Katu Vipaka. As it is very well known fact that Madhura rasa has the *karma of Sarva Dhatuvardhana, Balya, Jivana, Ayushya, Preenana, Tarpana, Sthairyakara, Sandhana, Vata Pitta hara,* which helps in proliferation, oogenesis, implantation. *Guru Guna has Balya, Brumhana, Tarpana, Vata hara, Sheeta Veerya has Sthambana karma.*[17] These *Karmas* will help in proper ovum formation, fertilisation, implantation and further development of the foetus in the womb.

The hypothalamic-pituitary-ovarian (HPO) axis is a tightly regulated system controlling female reproduction, starting from the production of Gonadotropin releasing hormone, which are the precursor of release of estrogen and progesterone hormone to the birth of the child. In the HPO axis cascade of events regulated, it selects a dominant follicle for ovulation,

influences the hormonal milieu required for oocyte maturation, fertilization and priming the endometrium for implantation. This complex regulation can be negatively impacted when pathologies occur within any juncture of the HPO axis, which in turns into imbalance in estrogen, progesterone hormonal milieu regulation and leads into ovulatory dysfunction, endometriosis, adenomyosis and fallopian tube blockages, other gynaecological acquired disorders like Pelvic inflammatory disorders, infections, may also contribute to accelerate reproductive aging.[18] Most of these consequences leads to ovulatory dysfunction and result into infertility.

Relevance of these drugs in Brihatrayees with respect to Garbhasthapana / Garbhakarini[19]

Based on the Guna Karma of the drugs *Padmakha* drug mainly helps in the implantation to the uterus and in sustainance of pregnancy, as it is having *Pittaasra hrit*, *Sthambana* and *Sandhaniya Karma*.

Shatavari has *Jeevaniya, Brumhaniya, Prajasthapana, Medhya* actions. Usage of *Shatavari churna* mixed with milk as a preventive remedy in *Garbhasrava* in 2nd of high risk pregnancy.

Yashtimadhu has *Sandhaniya*, *Shonitasthapana Karma* and it has got most references in prenatal care in high risk pregnancies in 1st, 2nd, 7th and 9th of pregnancy. *Pichu* soaked with paste of *Yashtimadhu* and *Gritha* and used for *Yoni Pichu* in *Prasaramsamana Garbha* and *Sthanantara gamita Garbha* (Threatened abortion).

Lakshmana and *Shweta Kantakari* drugs have indication during *Pumsvana Karma* orally or in the form of *Nasya. Lakshmana* is mentioned as *Prajasthapana Dravya* and *Shweta Kantakari* is mentioned as a preventive remedy in *Garbhasrava* in 5th and 8th month of pregnancy.

Jeevanaiya Gana drugs are mentioned during *Garbhini Paricharya* for both *Antahaparijanya* and *Bahirparijanya* for the benefit of both mother and foetus. These drugs are referred as *Garbha Sandhanakrit* by *Acharyas*, it's been mentioned in *Upashushka, Garbha Shosha, Upavishtaka.*

Vidarikanda siddha Ksheera is mentioned in *Garbhasrava* as a preventive remedy in *Garbhasrava* during 1st, 3rd and 9th month of pregnancy.

Hence it can be inferred that, drugs mentioned in the Bhava Prakash Nighantu definitely have role on the HPO axis and on the reproductive organs.

CONCLUSION

Drugs mentioned in Bhava Prakash Nighantu having *Garbhasthapana / Garbhaprada / Garbhakarini / Putrada* are 18 in number. Most of the drugs have *Madhura Rasa, Madhura Vipaka and Sheeta Veerya Dravyas*. These *Gunas* present in the *Dravyas* helps in the proper formation of *Artava* (ovum), gives nourishment through *Tarpana, Brumhana, Jeevaniya Karmas* of the drug as in implanting the fertilized ovum to the endometrial lining of the uterus, proper month wise development and nourishment to the fetus. It was observed in clinical practice that, *Shatavari, Yashtimadhu, Ashwagandha, Putanjeeva, Lakshmana* drugs are mainly used, but the implied ability of other drugs mentioned as *Garbhasthapana* are unexplored which has been already validated in the classics. Hence furthermore in vitro, in vivo and clinial studies are required to understand the mode of action of different drugs acting as *Garbhasthapana* in different dimensions and implementation of these drugs in the clinical practice.

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