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A Review on Role of *Pushpadhanwa Rasa* in Ovulation Induction for Management of Anovulatory Factor of Infertility.

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ABSTRACT:

The integral part of achieving *Sreyasi Praja* are *Garbhasambhava Samagri* which includes *Ritu* (fertile period), *Kshetra* (uterus and reproductive organs), *Ambu* (proper nutrient fluid) and *Beeja* (Shukra Shonita) and also normalcy of *Hrdaya* (psychology). As there are many causes for *Vandyatwa* mentioned, in this study *Vandyatwa* due to *Arthava Nasha* or Ovulation disorders account for about 30-40% of female infertility. Anovulation is the failure to produce a mature ovum by ovary. Anovulation is caused due to defect in the function of the hypothalamo-pituitary-ovarian axis. *Aartava* is considered as ovum and it is formed as a *updhatu* after proper digestion of *ahara rasa* by *prakrit agni*. If *agni* is disturbed by *ahita aharavihara* formation of *rasadi dhatu* and thereby formation of *artava* is also affected causing "*Nashtartava"* which can be considered as anovulation. In such patients ovulation induction is a rescuer. In Ayurveda, *Vandhyatva* is a *Vata Dosha Pradhana Vyadhi* and Ovulation is under the control of *Vata* especially *Apana Vata*. *Vandhyatva* due to ovarian factor is *Vata-Kapha Pradhan Vyadhi*. It is *Vikruti* of *Vata Dosha* i.e., *Apana Vayu Karmatah Hani* occurs. Hence main line of treatment could be *Vata Kapha Shamaka*, *Agnidipana*, *Pachaka* and *Vatanulomaka* and *Brimhana* which is the line of management to correct the *Samprapti* and to restore fertility.

Keywords: *Vandhyatva*, *Nashtartava*, *Ovary*

INTRODUCTION

WHO (world health organization) classification of anovulation:

1. WHO class 1: Hypogonadotropic hypogonadism: can be caused by any lesion affecting the pituitary or hypothalamus and affecting gonadotropin production.
2. WHO class 2: Normogonadotropic hypogonadism: commonest cause of anovulation and most commonly caused by polycystic ovarian syndrome.
3. WHO class 3: Hypergonadotropic hypogonadism: usually indication of ovarian failure.[1]

Medications for ovulation induction have a major role in the production of the dominant follicles and endometrial growth. In addition, they prevent androgen to estrogen conversion, act as an antagonist on estrogen receptors; help in insulin sensitization of tissues; and direct stimulation of the hypothalamus through gonadotropins. These medical treatments aim to improve the chances of conception in otherwise infertile couples.

Ovarian Steroidogenesis

The normal functioning ovary synthesizes and secretes the sex steroid hormones-estrogens, androgens and progesterone, in a precisely controlled pattern determined in part by the pituitary gonadotrophins, FSH (follicle stimulating hormone) and LH(luteinizing hormone) the most important secretory products of ovarian steroid biosynthesis are progesterone and estradiol.Sex steroid hormones play an important role in the menstrual cycle by the preparing the uterus for implantation of the fertilized ovum. If implantation does not occur, ovarian steroidogenesis declines, the endometrium degenerates and menstruation ensue.

Anovulation: The ovarian activity is totally dependent on the gonadotropins and the normal secretion of gonadotropins depends on the pulsatile release of GnRH from hypothalamus. As such, ovarian dysfunction is likely to be linked with disturbed hypothalamo-pituitary- ovarian axis either primary or secondary from thyroid or adrenal dysfunction.

Thus, the disturbance may result not only in anovulation but may also produce oligomenorrhea or even amenorrhea. Other causes of anovulation are: polycystic ovarian syndrome, elderly women and women with premature ovarian failure [2]

Anovulation is a common cause for female infertility in today's generation. In anovulatory condition though their serum FSH concentration is normal, menstruation will be irregular and excessive as endometrium is proliferated under influence of estrogen and there is no progesterone synthesis. The endometrium is shredded by sudden withdrawal of estrogen and there is excessive and irregular shedding of endometrium. But their serum FSH concentration will be normal.[3] Conditions essential for ovulation to occurs normally are – Hypothalamic pituitary ovarian axis must be intact with pulsatile secretion of GnRH. Ovarian hormones must have good response at their respective target organs. Positive and Negative feedback signals to be properly active. Any abnormalities in above factors results in anovulation.

Pathophysiology of Anovulation

Follicular growth is independent till it attains the size of 2-5 mm. after that follicles are recruited by follicle stimulating hormone. During menstrual phase and even prior to it, due to absence of negative feedback of estrogen, progesterone and inhibin, anterior pituitary secretes FSH. FSH is responsible for follicular growth, helps in maintaining follicular microenvironment estrogen dominant rather than androgen, which is essential for continuous follicular growth and development into dominant follicle. Further FSH induces receptors for LH activity in granulosa cells which is needed for ovulation and luteinization process. The factors responsible for ovulation are LH surge. Before this there is estradiol surge which initiates ovulation. LH surge is essential for triggering of ovulation and follicular rupture about 36 hours after the surge. which FSH and LH levels are low. After luteal phase, corpus luteum Following ovulation there is formation of the corpus luteum, increasing concentration of progesterone slow down the frequency of the LH pulses. Luteal phase is constant in each menstrual cycle i.e., 14 days, during gets degenerated, progesterone levels fall. Again, FSH increases to recruit follicles for next menstrual cycle. The coordination between the follicle and hypothalamic pituitary ovarian axis and all gonadotropins those are FSH, LH, gonadal steroids estrogen inhibin is responsible for ovulation. This recycling mechanism is regulated by substance functioning as classic hormones (FSH, LH, oestradiol and inhibin) transmitting messages between the ovary and the hypothalamic-pituitary axis and autocrine/ paracrine factors, which co-ordinate sequential activities within the follicle designated to ovulate. Due to improper response to stimulus, improper function of IGF-2, inhibin and activin causes dysfunction of follicular receptor activity within the ovary.[4]

Importance *Beeja* in conception:

In *Manusmriti* it is mentioned that the *Beeja* is more important than the *Kshetra* as the progeny will possesses the qualities of *Beeja* embedded and not that of the field. The *Beeja* formed by the of the *Rasa Soumya bhava* gets *Agneyatwa* after undergoing *Dhatu paaka* by the influence of *Pitta*. Any abnormalities in *Beeja*, *Beejabhaga*, *Beejabhagaavayava* results in genetic abnormalities in the progeny, *Abeejatha* or anovulation may be one of such

pathology which could be genetic inheritant. Under Twenty *Yonivyapath* all most all of the gynaecological diseases are included. if they are not treated properly cause infertility *(Abeejata)* [5]

Cause for failure conception during these days: As the day's proceeds after the *Rutukaala*, the *Garbhashaya Mukha* becomes *Sankocha* and prevents the entry of *Shukra* just like the bloomed lotus closes as sun sets. Same way the sperm deposited after the ovulatory period will be fruitless as the cervix will be constricted during this period.

Time in relation to ovulation and conception:

Ovulation occurs approximately after 16 to 24 hours of LH surge hence 12 to 16 days after *Arthava Chakra* is considered as fertile period the ovum can survive 72 hours after ovulation and sperm can survive for 72 hours in female genital tract. Hence, we can say that fertile period will be of 120 hours same way spermatogenesis takes 60 to 63 days to complete and capacitation of sperm happens in 2 to 6 hours after it reaches the ovum.

References of *Pushpadhanva rasa* in various texts of Ayurveda

- In Rasatarangini, improper growth of ovaries, fallopian tubes leading to *Vandhyatva* is mentioned as an indication of *Pushpadhanva Rasa*.[6]
- Rasatantrasara siddhaprayoga sangraha also describes the same indication.[7]
- Bhaishajya Ratnavali, Yogatarangini and Yogaratnakara have indicated *Pushpadhanva Rasa for Vajikarana* mentioning same ingredients.[8,9,10]

Role of *pushpadhanwa rasa* in treating anovulation

Clinically it has been observed that Ayurveda helps in treating anovulation which further causes infertility. Ayurvedic medications help by not only treating the symptoms but also by strengthening the reproductive system and improving the local cellular immunity.

'*Pushpadhanva*' is another name for *Kamadeva*, the God of love and desire. The nomenclature of *Pushpadhanva Rasa* thus implicates its action as *Vajikara* in both males and females. Anovulation in Ayurveda can be broadly referred to as *Beejadushti*, *Abeejata* and *Abeejotsarga*. We can thus consider all the causes of anovulation under one roof of these concepts of Ayurveda. Anovulatory infertility is gaining a rising incidence in contemporary era. As it is multifactorial and has deleterious effects on the physical, social and psychological status of the individual, it inevitably needs an effective, all-inclusive treatment protocols. *Rasaushadhis* are a unique group of drugs in Ayurveda which have a variegated actions on various systems of the body in a short period and in a low dose. Considering these facts, *Pushpadhanva Rasa* is a wonder drug is mentioned in Ayurveda which acts on the reproductive systems of both males and females. Therefore, an attempt is made to exhibit the details about *Pushpdhanva Rasa*, in the present article. Table 1 Ingredients Of Pushpadhanva Rasa And Their Properties [11-20]

DISCUSSION

Vandhyatva due to ovarian factor is *Vata-Kapha* Pradhan *Vyadhi*. It is *Vikruti* of *Vata Dosha* i.e., *Apana Vayu Karmatah Hani* occurs. Hence main line of treatment could be *Vata Kapha Shamaka, Agnidipana, Pachaka* and *Vatanulomaka* and *Brimhana*. Impairment of *Apana Vayu* is primarily responsible for this trouble.

Patients suffering from infertility due to anovulation go through a chronic mental turmoil due to repeated examinations and investigations with no results. In such a circumstance, it becomes necessary to chalk out the treatment wisely, which has quick, wholesome (having multiple effects) and which fulfils patient compliance. All the *Bhasmas* in *Pushpadhanva Rasa* have *Tridosha shamaka, Deepana* and *Pachana* properties due to which the basic step of *Agnimandya* involved in the *Samprapti* is relieved. Hence, correction of *Dhatvagni* occurs leading to proper formation of *Rasa dhatu*. This results in proper formation of *Upadhatu, Artava* which can be interpreted as hormones, menstrual blood as well as ovum. *Vatashamaka* property is found in all the *Bhasmas*. *Rasasindoora* exclusively has *Panchavataniyamana* property. Thus, *Vata dushti*, the pivotal cause for *Artavavaha Srotasa dushti* is acted upon by the *Vatashamaka* property of all the *bhasmas.* Thus, the Prakrut karmas of *Vata*, of *Vyuhana, Sanghatkara, Vibhajana, Rasa-rakta samvahana, Utsarjana karma* are all restored resulting in proper *Beejotpatti* and *Beejotsarga*. *Naga 107hasma* and *Abhraka bhasmas* with their *Madhura, Snigdha* properties bring about *Dhatu poshana* and *Bala vardhana*. *Naga, Vanga, Abhraka* in *Pushpadhanva Rasa* have unique property of acting directly on *Prajanana sansthana and Andakosha*(ovaries). [21] Therefore, have a specific effect o**n** growth, maturation and Rupture of follicles on account of their *Prabhava*. Most of the *Bhavana dravyas* have *Tikta, Katu rasa* which will help in *Kapha Shamana*. Also due to

their *Ushna veerya*, *Vata shamana* and *Pitta niyamana* properties are embibed into the *yoga* which help in *Prakrut pitta karma* of *Pachana* and *Parinamana* as well as *Vata karma* of *Utsarjana*. *Madhura rasa* of *Shalmali* contributes in bringing about *Prinana, Brimhana*, required for growth of the *Beeja*. Role Of *Pushpadhanva Rasa* In *Samprapti Vighatana* Of Anovulation[22] Flow chart 1

CONCLUSION

Most of the ingredients of *Pushpadhanva Rasa*, have *Tridosha nashaka* properties which act pinpointedly in *Samprapti Vighatana*. Drugs having the property of *Vataniyamana*, *Pitta-kapha shamana* help in correction of a major *Kriyatmaka* factor in *Beejotpatti* and *Beejotsarga*. Also, *Manasika dushti* is taken care of by *dravyas* like *Rasasindoora* and *Abhraka bhasma*, rendering the drug to be highly effective in reversing back the *Samprapti*. It can thus be rightly concluded that *Pushpadhanva Rasa* is a promising drug in Ayurveda in cases of anovulatory factor of *Vandhyatva*.

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Table 1 INGREDIENTS OF PUSHPADHANVA RASA AND THEIR PROPERTIES

Drugs	Properties
Naga Bhasma [11]	*Lekhana, Dipana, Pachana, Prameha, Kapha-vataghna, Kamodipaka, Balya*
Abhraka Bhasma [12]	*Vrishya, Ayushya, Putraprad, Pragyabodhi*
Rasa sindoora [13]	*Vrishya, Rasayana, Balya*
Vanga Bhasma [14]	*Balya, Varnya, Dipana, Vrishya, Madohara, Panduhara, Lekhana, Medhaya, Rasayana, Prijanankar*
Lauha Bhasma [15]	*Lekhana, Vrishya, Rasayana, Pandu, Medohara, Kapha roga nashaka*
Dhatura [16]	*Vajikarana, Garbhadhana*
Yastimadhu [17]	*Shodhhan, Vrishya, Rasayana, Putraprad, Vajikara, Khinaretas, Vandhyatva, Alpretas*
Nagavalli [18]	*Vajikarana, Kamodipana, Vata dosa shamaka, Shodhan*
Bhanga [19]	*Vajikar, Shukra Sthambhaka, Vedana Shamaka, Kamodeepaka, Medhya,*
Salmali [20]	*Veeryavardhak,Garbha sthapak, Kamodipaka*

Flow Chart ROLE OF *PUSHPADHANVA RASA* IN *SAMPRAPTI VIGHATANA* OF ANOVULATION 22