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“SCREENING OF HERBAL CONTRACEPTIVE”

Dr. Pranali P. Dounde¹, Dr. Hemalata Kongi², Dr. Hrishikesh Metkari³.

¹PG Scholar, Dept. of Strirog and Prasuti Tantra

²Professor, Professor, Dept. of Strirog and Prasuti Tantra

³Associate Professor, Dept. of Strirog and Prasuti Tantra.

L.R.P. Ayurvedic Medical College, Hospital, P.G. Institute & Research Center Islampur,
Sangli. Maharashtra

Corresponding Authors Email ID:

Email ID: swamisamarth1979@gmail.com

ABSTRACT

The population of world is increasing much faster. It is affecting many socio-economic conditions. The population control is now becoming a national priority. The contraceptives are used in modern medicines long back. There are also many new contraceptives available but they have various side effect. Many contraceptive methods have a higher failure rate so there is need for new approach for the problem. In ayurvedic text many drugs are explained which prevents the pregnancy which is called Garbhanirodhak drugs. In Samhitas the contraception is explained by describing the four necessary factors like ritu (Time period), Kshetra (uterus), Ambu (liquid secretions) and Beeja (ovum & sperm). The union of one or two factors is necessary for fertility and if we restrict the union of one or two factors we can prevent the conception. In this paper we are going to study various Garbhanirodhak drugs and Kalpas mentioned in ancient texts.

Keywords –

Herbal contraceptive, Ayurvedic, Garbhanirodhak, Antioovulation, Abortifacient.

INTRODUCTION

Rapid growth in population is burning problem in world wide. Family planning saves woman's lives and prevents unintended pregnancies; slows population growth, conserves resources improves health and living standard. Contraception is a method used to prevent pregnancy. Contraception includes all measures temporary or permanent, designed to prevent pregnancy due to the coital act. In our society men are never interested to use contraceptive methods so female contraceptive method always remain priority method for family planning. Contraceptive should be effective reversible, nonirritating, cheap and highly acceptable. Several hormonal contraceptive developed and used till date but as they are chemical based, expensive and some side effects (temporary and permanent) like nausea, weight gain, headache, CA of cervix, CA of breast etc. there is a need of some other alternative to the hormonal contraceptive. Numerous herbs have been used historically to reduce fertility. The modern research has tested and conformed anti fertility effect in most of the herbs. Herbal contraception may not reach the level of contraception protection as the pill but it offer alternative to women who have difficulty with hormonal contraceptive. Through review of literature and survey of ancient and modern

pharmacology many plants have scientifically proved antifertility activity. These plants may be valuable source of herbal contraceptive for woman.

Need of Herbal Contraceptives

Traditional herbal drugs and their formulations generally involve the use of extracts of Medicinal plants. Most of the world's contraceptive users are women. As women from rural areas and developing countries found difficulty in accessing modern contraceptives so Herbal contraceptives provides an opportunity for them to use cheap, potential and efficient drugs having lesser side effects, Herbal medicines requires a testing for its efficacy and effectiveness since they do carry minor risks. A number of medicinal plants have been used for contraception. Various herbs have been used from a long time to induce infertility, and modern research has tested and confirmed anti-fertility effects in most of the herbs. During the last few years, the use of herbal medicine has been fastly growing all over the world. But these herbs have a cumulative effect on body. A medicinal plant contains certain ingredients that are active in treating and preventing number of diseases. The high cost of modern drugs, unavailability in remote areas and severe side effects have increased the demand of herbal medicines which are obtained from the plant extracts.

Mode of action of herbal drugs.

Herbal drugs induce infertility in distinct ways. They may affect on ovary, uterus, hormone production, inhibition of hormonal action. Interfere with implantation, sperm production; some prevent fertilization by generating a productive layer around an egg. According to these action the plant can be divided into different categories as:

S. No.	Plants	Mode of Action on reproductive system
1	Antifertility plants	Prevents fertilization
2	Anti-ovulatory plants	Inhibits ovulation
3	Anti-implantation plants	Blocking implantation
4	Abortifacient plants	Causing early abortion

Table 1.1

- 1) Antifertility drugs are that obstruct the formation of gametes and interfere with the process of fertilization.
- 2) Anti Ovulatory drugs are anti fertility agents that induce infertility by suppressing the ovulation.
- 3) Anti implantation drugs are agents that prevent the attachment or penetration of fertilized ovum into the uterus.
- 4) Abortifacients are those substance which causes early expulsion of fetus.

Active Ingredients present in medicinal plants

As far as we are concerned with the herbal drug, so the medicinal plant extracts can be used as a drug in its purified form to induce infertility. It is also known that the active ingredients present in plants that would be helpful in obtaining drug could be Alkaloids, Glycosides, Saponins, Tannins, Terpenoids, Isoflavonoids etc. It was observed that alkaloids are the only phyto constituents that may be responsible for altering the reproductive systems in animals & human, in plants studied before.

Herbal plants for contraception in females

1) Piper longum (S.N. Pippali, E.N. Indian long pepper) Piperaceae

Ras panchak of *Pippali*, *Ras* (taste) is *Katu* (pungent), *Vipak* (metabolism) is *Madhur* (sweet), *Virya* (potency) *Anushnasheet*, *Guna* (quality) *Laghu* (light) *Snigdha* (unctuousness), *Tikshna*(fast acting)^{1,2}. On phytochemical screening glucosteroid, isobutylamide, piperine, chavisine, pipartine, sesamin, pipasterol, steroid, glucosteroid, piperlonguminine are found. Piperine is major alkaloid of peppers. Root powder exhibited antifertility activity. According to *Acharya Bhavaprakash* women who use equal quantity of powdered Pippali, Vidang and

Tankan with water or milk during *Ritukul* never conceives³.

Evidenced based effect of *Pippali* on female contraception

The crude extracts, its different fraction and the major pure compound from the active fraction of the powdered fruits of *Piper longum* were studied for the anti-fertility effect in female rats. The crude extracts and its hexane fraction exhibited 100% and 86% efficacy respectively (day 1-7 post coital schedule). On the other hand, 1-butanol soluble, 1-butanol insoluble and chloroform fractions were inactive⁴. Hexane fraction of fruit of *Piper longum* (PLHF) at doses 150mg and 250mg/kg were given to mature female rats for thirty days. PLHF treatment prolonged the length of estrous cycle and there was drastic reduction in the number of implantation sites, marked suppression in the ovarian cytokines, cyclooxygenase-2 and nitric acid level, histopathological degeneration of uterine glands and endometrial epithelial cells. The serum level of LH, FSH and estradiol were altered⁵. It seems that hexane fraction is potent contraceptive, further work is suggested to be carried out to know the specific phytochemical ingredients causing antifertility effect. Benzene extract of *Piper longum* in combination with methanol extract of *Embelia ribes* berries

lead to inhibition pregnancy in 80% of animals⁶.

2) *Embelia ribes* (S.N. Vaividang, E.N. *Embelia*) Myrsinaceae

Ras Panchak of *Embelia ribes* are *Ras Katu Kashaya* (astringent), *Vipak Katu*, *Virya Usna*, *Guna Laghu*, *Ruksha* (rough), *Tikshna*⁷. On phytochemical analysis Berries gave quinones, embelin, embolic acid, glycosides, saponins, tannins, and phenolic compounds. Active principles are found to be oestrogenic and weakly progestogenic.

As stated above it is potent contraceptive with *Pippali*.

Evidenced based effect of *vaividang* on female contraception

Embelin, isolated from the berries, shows significant anti-implantation and post-coital antifertility activity. (Successful trials have been carried out at the National Institute of Immunology, New Delhi on human beings.). Embelin (embelic acid; 2,5-dihydroxy-3-undecyl-1,4-benzoquinone), has been investigated for its activity. It provoked remarkable anti-implantation activity when administered at 50 and 100 mg/kg doses and also reduced significantly the number of implantations ($P < 0.01$) applied on 4th day of pregnancy) was 300 mg/kg ($P < 0.01$). Its MED (50 mg/kg) exhibited significant antiestrogenic and progestational

properties ($P < 0.01$) but could not elicit any antipregnancy activity.

3) ***Plumbago zeylanica* (S.N. Chitrak, E.N. Lead wort.) Plumbaginaceae**

Raspanchak of *Chitrak* is *Ras Katu, Vipak Katu, Virya Usna, Guna Laghu Ruksha Tikshna*¹⁰. Phytochemical constituents present in *Chitrak* are plumbagin, alkaloids, glycosides, reducing sugar, simple phenolics, tannins, lignin, saponin and flavonoids.

In *Kuchimartantra* and *Anangaranga*, root of *Chitraka* is described to be boiled with rice wash, and after filtration, the decoction is to be taken consecutively for three days after cessation of menstrual flow. It makes the women barren forever. In *Pancasayaka*, this decoction is said to make the women barren.

According to *Yog Ratnakar*, Widow Woman of high family gets herself aborted by using one *Karsa* (12g) root of *Chitraka* (*Plumbago zeylanica*) potted with juice of *Nirgundi* (*Vitex negundo*) and mixed with honey¹². Its root is used as abortifacient¹³. Fresh root (3-4inch) is used as intra vaginal insertion device for 15minute act like abortifacient. Five to six pieces of fresh root are dipped in 20-30 ml of cold water for ten minutes and two tea spoon of decoction is taken twice a day for a single day, act like abortifacient¹⁴.

Evidenced based effect of Chitrak on female contraception

A study reveals that the Plumbagin free alcohol extract (PFAE) of *Plumbago zeylanica* root exhibit significant anti-implantation and Abortifacient activity at the tested dose levels (300mg and 500mg/kg)¹⁵

4) ***Azadirachta indica* (S.N. Nimba, E.N. margosa tree) Meliaceae**

Raspanchak of *Nimba* are *s*¹⁶. On phytochemical analysis chemical constituents present are nimbin, nimbidin, nimbosterol, nimbidol, Volatile oils, tannins, margosin, glucoside, aminoacid, calcium, Potassium, Iron.

According to *Yog ratnakar*, the woman who after ritukala properly fumigates her vaginal canal with the wood of *Nimba* (*Azadirachta indica*) never conceives¹⁷.

Evidenced based effect of nimba on female contraception

Neem oil, a traditional plant product, for long term and reversible blocking of fertility after a single intra uterine application is described. In this study neem oil, a single dose (100 μ l) was given to fertile female Wistar rats by intrauterine route and control group animals received the same volume of peanut oil. The rats treated with neem oil remained infertile from 107 to 180 days even after repeated mating with males of

proven fertility, whereas all control animals become pregnant. Unilateral administration of Neem oil in the uterus blocked pregnancy only on the side of application whereas the contralateral uterine horn treated with peanut oil had normally developing foetuses; no sign of implantation or foetal resorption was noted in the Neem oil treated horn. No effect of treatment on ovarian functions was found¹⁸.

Another study reveal that Neem oil is pressed from the bark of *Azadirachta indica* is considered as spermicidal agent when used intra vaginally. It also has antimicrobial and antifungal properties. *Azadirachta indica* flower alcoholic extract given to rats at dose level of 1g/kg body weight produced an irregular pattern of oestrous cycle with prolonged diestrus phase. Also subsequently lower the frequency at which the estrus phase occurs with partial block in ovulation¹⁹.

5) *Daturametel*

(S.N.*Datura*, E.N.thornApple)

Solanaceae

Ras Panchak of *datura metel* *Ras Tikta, Katu, Vipak Katu, Virya Usna, Guna Laghu, Ruksha, Vyavayi, Vikashi* ²⁰ . On phytochemical analysis hyoscimine, scopolamine, hysciamine, atropine, meteolodine, nor hyosciamine constituents are found. According to *Yog*

Ratnakar there is no chance of conception to the women having coitus after tying in the waist the root of *datura* uprooted on 14th day of first fortnight of lunar month. Once she removes this root she conceives²¹.

Filling of vaginal canal with the powder of above mentioned root of *datura* before coitus also prevents conception.

Fresh root paste decoction of *Datura metel* should be prepared and 2 tea spoon decoction is taken once a day for five days in empty stomach act as abortifacient .

Evidenced based effect of *datura* on female contraception

A study on the acetone extracts of *Datura metel* seed administered orally in the concentration of 0.5%, 1% and 2% respectively for 15 days in female albino rats shows 2% seed extract cause cent percent anti-implantation activity.

6) *Hibiscus rosa sinensis* (S.N. *Japa*, E.N. *Hibiscus*) Malvaceae

Ras Panchak of *hibiscus* *Ras kshaya, Tikta, Vipak Katu, Virya Shit, Guna Laghu, Ruksha*²². On phytochemical analysis the constituent present in *hibiscus* are steroids, tannins, saponins and flavonoids.

According to *Bhav Prakash Chikitsha sthan* 70 the menstruating woman who uses flowers of *Japa* (*Hibiscus rosa sinensis*) mixed with *Kanji* followed by

100 years old jaggery in the dose of one pal (40 g) for three consecutive days never conceive²³.

Hibiscus rosa sinensis possess anti-implantation activity. Flower of *japa* is described in *Bhava Prakash, Brhan Nighantu Ratnakar and Yogaratnakar* to produce sterility in the women. In *Brhadyoga tarangini*, it is mentioned that if taken during the time of delivery of a child, is stated to prevent future conception and, if at all there is conception, the fetus will not grow, by implication, there will be an abortion²⁴.

Paste of 5 flowers of *Japa* is prepared and mixed with one tea spoon honey. 2 tea spoonful of this paste is taken every day in empty stomach for 3 days' act as abortifacient²⁵.

Evidenced based effect of *Japa* on female contraception

In an experimental study *Hibiscus rosa sinensis* (*kanji bhavit japa kusum*) oral drug has proved temporary contraceptive medicine in albino rats²⁶.

7) *Sapindus trifoliatus* (S.N. Arishtak, E.N. soap nut tree of south India) Sapindaceae.

*Ras Panchak of arishtak Ras Tikta, Katu, Vipak Katu, Virya Usna, Guna Laghu, Tikasan*²⁷. On phytochemical analysis - Saponin, sugar, oil, mukoroside, proteins are present.

Evidenced based effect of *Arishtak* on female contraception

Saponins from *Sapindustrifoliatus* are known to be spermicidal. This spermicidal property has been used in contraceptive cream²⁸.

Fruits of *Sapindus trifoliatus* are used as traditional medicine for birth control purpose. The present study is performed to evaluate its acclaimed post-coital pregnancy interception, along with associated toxicity profiles and to assess its effects on reproductive hormones.

A study reveals that the butanol extract of fruits of *Sapindus trifoliatus* at a dose of 20 mg/kg body weight inhibited fetal implantation 100% and also exhibits antiestrogenic activity. Significant variations found in gonadal and gonadotrophic hormone in serum²⁹. Toxicity studies reveal nontoxic nature of the extract.

8) *Daucas carrota* (S.N. Grinjana, E.N. carrot) Apiaceae

*Ras panchak of ducas carrota Ras madhur, kashaya, Vipak madhura, Virya usna*³⁰. On phytochemical analysis protein, carbohydrate, carotin, vitamin B, D and C, phosphorus, iron are present. According to *Rajnighantukar* the seeds of *Daucascarrota* are *Garbhpaatkrita*. Women have used the seeds from *Daucuscarota*, commonly known as wild carrot or queen

Anne's Lace, for centuries as a contraceptive.

Evidenced based effect of Grinjan on female contraception

Extract of seed of plant showed petroleum, ether, benzene, alcohol and water 85%, 95%, 92%, 50% of anti-implantation activity, respectively. On animal experiments this drug is found to have antifertility property³².

9) *Caricapapaya* (S.n.ErandkarkatiE.n.papaya) Caricaceae

*Raspanchak of papaya are Ras katu tikta, Vipak katu Virya usna, Guna Laghu Ruksha Tikshna*³³. On phytochemical analysis papain, caricine, carposide glycoside, myrocine, carpasemine are present. Shri bapa lal Vaidya said that the seeds of *Carica pappya* act as abortifacient³⁴. Fresh or dried seeds paste is prepared, 2 tea spoon paste decoction taken every day after menstrual period till commencement of next menstrual period. It acts as contraceptive.

10) *Cucuma longa* (S.n. *Haridra*, E.N. turmeric) Zingiberaceae

*Ras panchak of haridra Ras Katu and Tikta, Vipak Katu, Virya Usna, Guna Ruksha Laghu*³⁵. Chemical constituents present in haridra are curcumin, flavonoids and aminoacids and alkaloids. According to kucimartantra one piece of the node of the rhizome of haridra should be taken

every day, for six days (three days during menses and three days thereafter) produce sterility³⁶.

Evidenced based effect of *Haridra* on female contraception

In a study, it indicated that the aqueous extract of *Curcuma longa* possesses postcoital contraceptive efficacy by virtue of anti-implantation activity³⁷.

The aqueous extract of rhizome of *Curcuma longa* possesses anti-plantation activity and the mild estrogenic nature of the extract may be responsible, at least partly, for this anti- conceptive effect³⁸.

Curcuma longa was given to albino rats caused suppression of the oestrous phase and suppression of ovulation.

The petroleum and aqueous extract showed 100% anti- implantation in rats at a dose of 200mg/kg body weight when fed orally on days 1 to 7 of pregnancy³⁹.

11) *Gloriosa superba* (S.n. Langli, E.n. malabar glory lily) Liliaceae

*Ras Panchak of Langli, Ras Katu, Vipak Katu, Virya Usna, Guna Laghu, Tikshna Prabhav Garbhpatan*⁴⁰. Chemical constituent present in langli are Colchicine, Gloriosine, superbine benzoic acid, Salisilic acid, Colin, and Sugar. The root of langli act as Abortifacient (*Garbhapatni*)⁴¹.

Evidenced based effect of *Langli* on female contraception

In a study, Oral administration of hydroalcoholic extract of *Gloriosasuperba* at two different doses (30 and 60 mg/kg body wt) showed most significant dose dependent anti-fertility activity. The treated animals showed anti-implantation activity in postcoital study (administered from days 1 to 7). This study clearly reveals that the extract is effective before and after the implantation occurred. Hence, the drug indicated the highest anti-fertility activity. The loss of implantation may be due to their anti-zygotic, blastocytotoxic, anti-implantation or by early abortifacient activity⁴². There are too many more plants used as contraceptives, we can classify them according to their activity such as estrous cycle disruptors, antiestrogenic, anti-implantation, abortifacient.

Procedures in ayurvedic texts

i) Local methods

- 1) Applying the paste prepared with the seeds of *Palasa (Butea fTondosa)* and Honey during *StukaJa* into vagina.
- 2) Vaginal insertion of *Saindhava Isvsne* and *Tsils* before coitus.v
- 3) Vaginal fumigation with *Nimbs ka~rha* (Wood of *Azdirschte indica*) during *Rutukala:*"

- 4) Vaginal filling with *Dhsttursmiils* (Root of *Datura mete!*) *Curns* before coitus.'
- 5) Tying the root of *Dbetturs (Datura mete!)* in waist before coitus.v
- 6) Vaginal suppository prepared with of *Ik~viiku(Lagineria vulgaris)*, *Danti(Baliospermum montanum)*, *Pippali (Piper longum)*, Jaggery, *Madanaphala (Randia dumetorum)*, *Kinva*(Fermented liquid), *Yesti (Glyzyrhiza glabra)* and *Snuhi ksira* (Latex of *Euphorbia nerifolia*) induces menstrual flow."

ii) Oral methods

- 1) Administration of powdered *Pippali (Piper longum)*, *Vi<;laJiga(Embelia ribes)* and *Tsnksne* (Borax) with milk during *Stukala.I•5Concepts of Contraception in Ancient India &Status - Galib et al. 83*
- 2) Administration of paste prepared with of *Patha (Cesampelas pereira)* leaves after *Rtuksls?*
- 3) Administration of *Jspe (Hibiscus rosa-sinensis)* *Pusps* with *Kaliji* and *Guds* during *.{?tukaJa*for three days. 1,5
- 4) Administration of *Tsnduliysk« (Amaranthus spinosus)* *mula* with *Tsndukidsk»* after *.{?tukala* for three days."

5) Administration of *Talisapatra* (*Taxus buccata*), *Gairika* (Red Ochre) and Cold water

during *Ritukala*.

6) Administration of Fried *Jyotismsthi*.

Celastrus panniculata) Leaf paste along with *Japa*

(*Hibiscus rosasinensis*) *puspe* and water initiates the menstruation.

7) Administration of paste prepared with of *Tsundul* along with *Devdaru*

(*Cedrus*

deodora) and *Diirve* (*Cynodon dactylon*) initiates the menstruation."

8) Administration of 3 years old Jaggery for 15 days induces permanent sterility."

9) Administration of *Kssy* prepared with Rice water and Root of *Citraka* (*Plumbago*

zeylanica) after *Ritukala* for three days."

10) Administration of *Vibhitaki bija* (Seeds of *Terminalia belerica*) with *Tandulodaka*

(Rice water) during *Ritukala* for seven days.

iii) Abortifacients

1) Insertion of *Erend* (*Recinus communis*) *Pstrdsnds* in to vagina.'

2) Oral administration of *GpJjana bija* (Seeds of *Dacus carota*), *Dsdims mula* (Root of

Punica granatum), *Tuvari* (*Cajanus cajan*) and *Nagasindura* with water.

3) Oral administration of *Citraka mula* (Root of *Plumbago zeylanica*) triturated with

Nirgu (*Icji svarasa* (Juice of *Vitex negundo*) and *Madhu* (Honey).

4) Oral administration of Scrapped lime powder from the walls of temples with water.

5) Oral administration of *Ssrsspe* (*Brassica compestris*) *taila*, *Vstssnsbbe* (*Aconitum*

ferox), *Ajamoda* (*Apium graveolens*), *Saindhava*, *Kaliji* and feces of horse.

Similarly a good number of local/oral contraceptive methods are explained in recent classics, which may act as anti ovulatory or anti implantation or abortifacient agents. It is very essential to establish their actual efficacy, probable mode of action through well-designed experimental and clinical trials.

CONCLUSION

Woman plays important role in the family, she is also responsible for the well being of the family so women's health need to be safe and effective with minimal side effects. Family planning program and contraception has become an integral part of woman's health care so to empower her with prioritizing her duties. Medicinal plant extracts contain some active ingredients which are responsible for the antifertility effect. A number of herbs have been tested to induce infertility but they

need to be taken daily to maintain its effect. In various studies herbal compound had shown minimal side effects in comparison to the chemical compound so the value of the traditional knowledge of herbal contraceptive need to be highlighted to the masses in order to make it more acceptable and practiced.

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