



Review Article

Review of Ayurvedic Drugs Acting On Endocrine System

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ABSTRACT

Ancient Indian literature abounds with information on large numbers of drugs reputed to have sterilizing, contraceptive and abortifacient properties. Scholars of Ayurveda have also mentioned several plants in their Ayurvedic treatises. A number of these preparations are still being used by Ayurvedic physicians all over India, who claim their effectiveness but are unable or unwilling to produce data. In Ayurvedic system of medicines many drugs have been mentioned for many hormone related conditions like diabetice mellitus, thyroid, reproductive system etc. But it is very difficult to know how these drugs are acting on endocrine system. In this paper effort is made to review articles published on prevention of conception mentioned in Ayurvedic classics and their effect related with endocrinology.

Key words: *Ayurveda, Endocrine, Sterilizing, Abortifacient, Reproductive system,*

INTRODUCTION

Many indigenous plants and minerals were used by Ayurvedic physicians in India from time immemorial for prevention of conception. Very little scientific data is available regarding the nature of the active components and their mechanism of action

Krishna jeeraka(*Nigella sativa*)

Nigella sativa cultivated in North India, was tested for its post-coital contraceptive efficacy in rats. Hexane extract of the seeds prevented pregnancy in rats. Significant

antifertility activity was also observed in its column fraction and subfractions. ^[1]

Champaka (*Michelia champaka*) & **Vanya Jeeraka** (*Centratherum anthelminticum*)

Benzeneextract of the anthers of *Michelia champaka* and ethanolic extract of the seeds of *Centratherum anthelminticum* also showed significant post-coital anti-implantation activity in rats. ^[2]

Talisa Patr (*Abies webbiana*)

Benzene and alcoholic extract of *Abies webbiana* leaf produced 51 % anti

implantation activity. The extracts had no effect on post implantation period, oestrous cycle and teratogenicity. [3]

Arjuna (*Terminalia arjuna*)

Terminalia arjuna in crude form showed anti implantation as well as abortifacient activity. [4]

Heengu(*Ferula jaeschkena*)

Hexane extract of *Ferula jaeschkena* commonly known as “Heeng” is well known for its antifertility activity. Administration of the extract to adult cyclic guinea pigs showed duration dependent luteolytic changes in the corpora lutea. Ovarian wet weight, proteins and glycogen contents were decreased while the activity of acid phosphatase in the ovary was increased. [5]

Bilva (*Aegle Marmelos Corr.*)

Aqueous extract of the leaves of *Aegle Marmelos* was studied for its abortifacient activity in albino rats. The drug did not show any anti-implantation activity, but showed a dose-dependent abortifacient activity. Abortifacient activity was increased with advancement of pregnancy. [6]

Nimba -*Azadirachta indica A. Juss*

The effect of *Azadirachta indica* on reproductive system of albino rats. Study of the histological and biochemical changes in the testis after treatment with neem leaves and its pattern of recovery, revealed its possible reversible antiandrogenic property. [7] Neem leaves produced histological and biochemical changes in the caput and cauda epididymis. [8] Oral administration of the dry leaf powder resulted in decrease in the weight of seminal vesicles and ventral prostate, reduction in epithelial height and nuclear diameter and the secretory materials in the lumen. [9]

Nagakeshara (*Mesua ferrea*)

Flowers of *Mesua ferrea* exhibited anti implantation activity in female rats. [10]

Potash Alum

Human studies- Increase in concentration of potash alum decreased the time for death/complete immobility of sperm, collected from healthy volunteers. [11]

Alcohol

Alcohol induced perturbation on the functional integrity of the testis, thyroid and adrenal were observed in male alcohol addicts. However, 20 days period of total alcohol abstinence and rehabilitative program failed to reverse alcohol-induced hypoandrogenization and altered thyroid status, but only restored certain biochemical events associated with the excretion of steroid metabolites. [12]

Madayantika (*Lawsonia inermis Linn*)

The traditional remedy Madayantika (*Lawsonia inermis*) appears to have some contraceptive value under laboratory conditions, preventing pregnancy in 60% of the animals tested. None of the treated animals showed loss in body weight or abnormal estrus cycles. However, rats administered a high dose of Avrodhak failed to regain fertility up to 2 months after drug withdrawal. [13]

Japa -*Hibiscus rosa sinensis*

An herbal remedy with an ancient history is currently receiving attention as a potential tool in population control. *Hibiscus rosa sinensis* is a common ornamental plant cultivated widely throughout India and Burma. Flowers of this plant are said to possess anti-fertility property by ancient Ayurvedic texts. Traditional use of the flowers in Kerala (Southern India) is for its Emmenagogue and contraceptive action. Extracts of the flower of *Hibiscus*

Rosa sinensis administration to albino mice resulted in the decrease of spermatogenic elements of testis and epididymal sperm count. The drug also showed androgenic activity in immature mice. [14]

A problem common to pharmacological studies of plant remedies is the proper identification of most therapeutically active part of the plant, the best ecological conditions to grow or collect it from and the season variations. The Indian research team has found that only the flowers showed significant activity. This anti-fertility action was maximum during winter followed by spring then rainy and minimum in summer season. [15]

Much modern research has shown the flowers to have a post-coital anti-fertility activity. An example is a study undertaken in 1976 that indicated that the *H. rosa sinensis* flowers possess significant antifertility activity with the effects dependent upon the dose, duration of the treatment and the stage of the pregnancy. The presence of potent anti-estrogenic activity in the flower portion may be the responsible factor in terminating pregnancy. An antifertility agent can work by any one or combination of factors. These can include, rapid expulsion of the fertilized ova from the fallopian tube or by the tube locking mechanism; as a blastocyst-toxic agent; by the inhibition of implantation due to a disturbance in estrogen-progesterone balance; or through foetal absorption or abortion, perhaps due to lack of supply of nutrients to the uterus and thus to the embryo. In the light of above observations, it seems probable that the maximum anti-fertility activity occurs via inhibition of implantation. A restriction of oestrogen levels, which is indispensable for implantation, is considered a probable cause in termination of pregnancy. The researchers

demonstrated that the herbal extract possesses potent anti-estrogenic property. On the basis of present evidences it seems probable that, the treatment alters, in one way or other, the delicate estrogen-progesterone balance, resulting in termination of pregnancy. [16]

Not only does *H. rosa sinensis* have an impact on female reproduction but also on that of males. Extracts of the flowers also affect the generation of sperm as well as the endocrine function of the testes themselves. The herbs' effect upon the male reproductive system has been studied in rats by observation of changes in weight, histology and endocrine functions. In trying to find how the herb works, the researchers have suggested that it may be due to the inhibition of synthesis or the release of gonadotropins from the pituitary gland, a direct inhibitory effect of tested or hormonal activity. The extract given to young male rats caused a reduction in the weights of the testes, accessory reproductive organs and pituitary gland. There was a marked decrease in levels of the gonadotrophin hormones. After stopping the administration of the herb, spermatogenesis and secretory activity of accessory sex organs started again, thus indicating that the plants effects are transient. Hormonal activity is a totally integrated process, so it is important to look at any possible wider endocrine impact. The thyroid and adrenal are apparently unaffected. This suggests that the inhibitory effects of *H. rosa sinensis* on spermatogenesis are selective, mediated via the pituitary gland, without affecting pituitary-adrenal and pituitary-thyroid function. Though effective in affecting spermatogenesis the use of *H. rosa sinensis* as a male contraceptive is unlikely due to probable reduction of libido because it suppresses endocrine activity of the testis. Although, the effects are reversible,

persistent daily therapy would be needed because of the rapidity by which pituitary function could recover. [17] Such a herbal remedy having a potent antifertility activity in women and reversible anti-spermatogenic effect in men offers the potential of a safe and acceptable aid in the drive to controlling population growth.

Vidanga(*Embelicaribes*)

Dried berries of another Indian herb, *Embelia ribes*, have a tradition reputation for an anti-fertility activity. One of its active components, embelin has been documented to possess significant anti-implantation activity in rats but its hormonal activity is still controversial. Studies show that embelin is a potent oral contraceptive of plant origin which possesses 85.71% anti-implantation activity in rats when administered at 50 mg/kg for 7 days and also inhibits pregnancy at single dose regimen. Embelin is also known as embelic acid or to be chemically accurate 2, 5-dihydroxy-3-undecyl-2, 5-cyclohexadiene-1, 4-benzoquinone. Embelin inhibited pregnancy and also possesses anti-estrogenic and weak progestational activity. From this it is possible that administration of embelin may cause a disturbance in the hormonal levels and thus prevent implantation, since specific hormonal equilibrium of estrogen and progesterone is required for egg implantation. Another suggestion is that it produces a change in the uterine environment which inhibits or interferes in the process of implantation. It may also have a direct action on the hypothalamus and releasing factors, interfering thereby with the secretion of gonadotropins. [18] We are re-discovering the profound relationship that exists between plants, minerals and humanity. As the old rapport is renewed in a new context, many insoluble human problems will resolve.

CONCLUSION

Though this review is not complete in all the aspects, this gives a clear picture about the mode of research work carried out in India in the field of endocrine pharmacology. Only few pharmacology departments are concentrating on endocrinology, compared to other departments. Moreover, half the way stopping of the research is also a problem with our research laboratories. For example, number of preliminary studies being carried out on various activities of different plant extracts. However, very few researchers continue their work with the same plant to bring out appreciable products which have clinical significance. A constant effort is required in the same field to produce research work with international quality. However, it is appreciable that, some of our researchers could produce quality works with novel and innovative ideas. We hope in the coming years, more contribution from the Indian researchers will rich this field with quality products.

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