

ABORTIVE TENDENCY: PRESENT SCENARIO AND DRUGS MENTIONED BY SUSHRUTA- A RESEARCH UPDATE

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ABSTRACT

Ayurveda, the ancient system of medicine sprouted in the pristine land of India 5000 years ago, is the science of life and longevity and the oldest healthcare system in the world. Sushruta renowned as 'Father of Surgery' says as per 'Yuganurupasandarbha', the prevailing ancient system of medicine should mould to today's scenario. Though Ayurveda is believed to be a 'time-tested science', evidence based approach is the need of the hour. Threatened miscarriage wherein the pregnancy can still be saved is the commonest complications of pregnancy. It is characterized by vaginal bleeding occurring in about 20% to 30% of pregnancies. In Ayurveda, this clinical condition is described as 'Garbhasrava' and Sushruta gives a detailed description about the management of this condition in the chapter 'Garbhinivyaakaranashareeram' by mentioning group of drugs specifically for the month of abortion upto seventh month of gestation. Acharya also mentions management of this clinical condition occurring in 8th, 9th and 10th month of pregnancy. This is a unique contribution of Sushruta and this review has shown limelight on evidence based approach about utility of these classically recommended drugs even to this day.

KEYWORDS: Abortive tendency, Sushruta, Research update, Evidence based approach

INTRODUCTION

Approximately 15% of all clinically recognized pregnancies result in spontaneous loss. Recurrent pregnancy loss (RPL), also referred to as recurrent miscarriage or habitual abortion, is historically defined as 3 consecutive pregnancy losses prior to 20 weeks from the last menstrual period. Epidemiological studies have revealed that 1% to 2% of women experience recurrent pregnancy loss^[1]. Threatened abortion is a clinical condition where the process of miscarriage has started but has not progressed to a state from which recovery is impossible. It is the commonest complications of pregnancy occurring in about 20% to 30% of

pregnancies. Miscarriage is defined as spontaneous expulsion of a fetus from the womb before it is able to survive independently. Specifically Missed abortion, Blighted ovum, IUGR (Intra Uterine Growth Retardation), IUD (Intra Uterine Death), still birth etc- these are few of the clinical conditions which pose problem during the course of pregnancy. Sushruta while dealing about the management of 'Garbhasrava' in the chapter 'Garbhinivyaakaranashareeram', has described in detail about the group of drugs for every month upto seventh month of gestation^[2]. Acharya has also mentioned management during 8th, 9th and 10th month, for other clinical conditions which cause

threat for fetus in this phase of pregnancy. Modern studies reveal that alveolar phase of lung development in fetus takes place after 36 weeks of gestation. This proves that management during 10th month told in classics is absolutely scientific based. Hence, here is an attempt to review the drugs mentioned by Sushruta in this context through research activities pertaining to various causes described for loss of pregnancy in different trimesters of gestation on an evidence- based approach.

Causes for ‘Garbhasrava’ and ‘Garbhapata’ according to Sushruta^[2]:

Coitus, travelling in carriage, riding on horse, journey on foot, staggering or stumping, falling from height, compression, running, trauma by weapon, stones, whips etc., sleeping or sitting in uneven place, fasting, suppression of natural urges, consumption of excessive dry, hot or pungent diet, grief, diarrhoea, excessive use of alkalies, emetics and purgatives, swinging, indigestion and use of abortifacient drugs, due to these factors the fetus gets detached from its bonds in the same way as a fruit gets detached from its stalk due to trauma. As a fruit falls down ultimately due to effect of krimi, vata and aghata, similarly fetus also gets detached due to influence of all these factors. The conception occurring on third day of menstrual cycle or by a man of below twenty five or in a woman of below sixteen years of age is also expelled.

Restriction advised during ante-natal care as per Modern Science:

Exercise, Sexual intercourse, Alcohol, Smoking, Recreational drug use, Travel, fall, Excessive stress, exertion, drug abuse etc.

Common causes of Miscarriage as per modern science^[3]:

First Trimester:

- Genetic factors: 3-5%

- Endocrine and Metabolic disorders: Poorly controlled diabetes, presence of thyroid auto antibodies, Luteal phase defect, hypersecretion of luteinising hormone as seen in PCOS etc...
- Infection: TORCH etc.
- Inherited thrombophilia
- Immunological cause: Autoimmunity, Alloimmunity, Unexplained.

Second Trimester:

- Anatomic abnormalities are responsible for 10-15% of recurrent abortion. The causes may be congenital or acquired. Congenital abnormalities may be due to defects in the mullerian duct fusion or resorption. Congenital cervical incompetence is another condition. Acquired anomalies are: intrauterine adhesions, uterine fibroids and endometriosis and cervical incompetence.
- Chronic maternal illness: such as Maternal HTN, uncontrolled diabetes with arteriosclerotic changes, haemoglobinopathies, thyroid malfunction, chronic renal disease, inflammatory bowel disease, systemic lupus erythematosus.
- Infection: Syphilis, toxoplasmosis and listeriosis may be responsible in some cases.
- Unexplained.
- **Causes of complications in third trimester:**
 - Gestational diabetes
 - Preeclampsia
 - Preterm labour
 - Preterm Premature Rupture of membranes
 - Placenta previa
 - Abruptio placenta
 - IUGR
 - Post term pregnancy

- Malpresentation (Breech, Transverse lie)

Review of drugs mentioned by Sushruta along with supportive research activities:

YASHTIMADHU:

As Anti-inflammatory^[4]: The hydro-alcoholic extract of *Glycyrrhiza glabra* showed a maximum of 46.86% inhibitory action on carrageenan induced paw oedema at the dose of 200 mg/kg and inhibited the leukocyte migration in a dose dependent manner. The anti-inflammatory activity was comparable to the standard non-steroidal anti-inflammatory drug indomethacin (10mg/kg).

As Anti-bacterial^[4]: The anti-bacterial activities of the methanol, ethyl acetate, acetone and chloroform extracts of *Glycyrrhiza glabra* plant roots were tested against six bacterial species viz., *Bacillus coagulans*, *Enterococcus faecalis*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Salmonella typhimurium* by the agar disc diffusion method. The results indicated that the extract of *Glycyrrhiza glabra* showed various antibacterial activities (9-14mm/20µl inhibition zone) against the bacterial organisms tested.

As Anti-fungal^[5]: Glabridin component of *Glycyrrhiza glabra* was studied in Amphotericin B resistant *C. albicans*, in this study. The ethanol root extract of *Glycyrrhiza glabra* showed a wider spectrum of activity against various *C. albicans* strains. (Atiya Fatima, et al, 2009).

As Anti-viral^[6]: *Glycyrrhiza glabra* or Licorice has been proven beneficial against many DNA viruses such as Varicella zoster virus, Kaposi sarcoma-associated herpes virus, Herpes Simplex Virus-1, Epstein Barr virus, Human Cytomegalo virus, etc and RNA viruses such as Hepatitis C virus, Human Immunodeficiency Virus etc.

As Aphrodisiac^[7]: In the study focused on the Aphrodisiac property of *Glycyrrhiza*

glabra root extract on courtship behaviour and fitness of *D. Melanogaster*, the flies were treated with aqueous root extracts of *Glycyrrhiza glabra* by adult feeding method along with control. Mating latency and copulation duration was observed and the same flies were used to check their egg laying ability and fertility. The result showed that there is decrease in the mating latency and increase in copulation duration in treated groups compared to control and flies have showed increased fecundity and fertility in treated groups compared to control flies.

As growth enhancer^[8]: In the study “To evaluate and examine the effect of *Glycyrrhiza glabra* extract (GgE) on the fertilization rate and embryonic development *in vitro* using the mice as a model for mammals”, there was a significant (P<0 .05) increase in the fertilization rate (FR) of SUO mice oocytes (53.89%) by using 10% GgE Compared to IVF medium alone in SUO group(36.82%) . Addition of 10% GgE to the IVF medium, the number of 2-cell and 4-cell embryonic stages of SUO mice was significantly (P<0.05) higher than that of control mice embryos cultured with IVF medium alone (60% and 60% Vs. 51% and 54%, respectively).

SHATAVARI:

It has been demonstrated that the Shatavari containing preparations stimulates haemopoetic function and increase weight of accessory sex glands^[9-10]. Enhancing folliculogenesis and ovulation, preparing womb for conception, preventing abortions, Shatavari is beneficial in female infertility^[11-12]. Having Madhura Rasa, Shatavari is known to be Garbhasthapaka, useful in the prevention of abortions. Anti-abortifacient activity of Saponin glycoside A4 produces specific and competitive blockage of pitocin induced contraction and spontaneous motility^[13].

As Anti-abortifacient:

The preparations based on *Asparagus racemosus* roots (eg. Shatavari sidha ghrita) are recommended in cases of threatened abortions^[14].

As Antenatal tonic:

Asparagus racemosus root extract has shown to treat pre-eclampsia associated with pregnancy. In a clinical trial done on Sujat with 450 patients reports that regular use of this A.R. containing capsule during antenatal period enhances the fetal wt. and foetal out come and decreases the incidence of perinatal deaths. The incidence of pregnancy induced hypertension (PIH) is also decreased^[15].

MANJISHTA^[16]:

As Anti-inflammatory: *Rubia cordifolia* was studied for the anti-inflammatory effect in rats with carrageenan paw oedema. The plant showed significant anti-inflammatory activity at a dose of 10 and 20 ml/kg of the water extracts. The activity was comparable to that of phenylbutazone.

As Anti-bacterial: The antibacterial activity of the extracts of *Rubia cordifolia* roots prepared with solvents of different successive polarities was evaluated by the agar well diffusion method. It inhibited both gram positive and gram negative strains (Singh et al., 2005; Vlietinck, 1995).

As Anti-oxidant: Rubiadin, a dihydroxyanthraquinone, isolated from alcoholic extract of *Rubia cordifolia*, possesses potent antioxidant property. The percent inhibition was more in the case of Fe²⁺ induced lipid peroxidation. The antioxidant property of the preparation was better than the EDTA, Tris, mannitol, Vitamin E and p-benzoquinone (Tripathi et al., 1997).

As Anti-platelet activating factor:

The effect of the partially purified fraction of this whole plant had been studied on rabbit platelets. It inhibited the platelet

aggregation induced by PAF (platelet activating factor) but not thrombin. PAF (platelet activating factor) is a phospholipid involved in thrombosis, allergy and

nervous disorders. *Rubia cordifolia* extract also inhibited the binding of 3H labeled-PAF to the platelets in the dose-dependent manner. Thus it appears that *Rubia cordifolia* inhibits action of PAF at its receptor level either by its blocking or by desensitization (Tripathi et al., 1993).

As Antistress: Alcoholic extract of roots of *Rubia cordifolia* significantly decreased ulcer index, acidity, plasma corticosterone level, brain content of dopamine in a dose-dependent manner in animals under cold restraint stress (CRS) when compared with diazepam. Alcoholic extract of *Rubia cordifolia* increased brain content of GABA in dose-dependent manner in CRS treated animals (Patil et al., 2006).

KANCHANARA^[17]:

As Anti-inflammatory: Phytochemical analysis of non woody aerial parts of *Bauhinia variegata* yielded 6 flavonoids with one triterpene caffeate. These seven compounds showed anti-inflammatory activity, they inhibited the lipopolysaccharides and interferon γ induced nitric oxide (NO) and cytokines (31).

Immunomodulatory effect: The ethanolic extract of the stem bark of *Bauhinia variegata* showed immunomodulatory activity on the primary and secondary antibody responses. It has also increased phagocytic index and percentage neutrophil adhesion (35).

Hormone regulation: The aqueous alcoholic bark extract of *Bauhinia purpurea* (2.5 mg/kg body weight) and aqueous root extract *Withania somnifera* (1.4 g/kg body weight) on daily administration for 20 days, stimulating thyroid function in female mice. Both the plant extracts showed an increase in hepatic glucose-6-phosphatase (G-6-

Pase) activity and anti-peroxidative effects as indicated either by a decrease in hepatic lipid peroxidation (LPO) and/or by an increase in the activity of antioxidant enzyme(s). Serum triiodothyronine (T3) and thyroxine (T4) concentrations were increased significantly by Bauhinia. Withania could enhance only serum T4 concentration.

GOKSHURA^[18]:

Effect on genital system: The researchers observed that *Tribulus terrestris* showed significant increase in the number of growing follicles, diameter of mature follicles, endometrial lining cells height and endometrial glands diameter was obtained in both dose levels. As concerning the levels of reproductive hormones, although the differences were not significant, but an obvious increase was obtained in FSH and LH and a decrease in estradiol was detected in both dose levels.

Anti-hypertensive property: *Tribulus terrestris* possesses antihypertensive activity¹⁷. The biological properties of *Tribulus* extracts include diuretic properties, increased release of nitric oxide from endothelium and nerve endings; it relaxes smooth muscles and increases angiotensin converting enzyme (ACE) inhibition. Hence reduces the hypertension.^[25,26]

Vasodilator effects of methanolic and aqueous extracts of *Tribulus terrestris*: Phillips et al (2006) concluded that methanolic and aqueous extracts of *Tribulus terrestris* possess significant antihypertensive activity in spontaneously hypertensive rats.

Smooth muscle relaxant activity: Ethanol (95%) extract of the dried aerial plant, showed smooth muscle relaxant activity on rabbit duodenum.^[12]

Hypo-glycemic and hypo-lipidemic effects: The extract of both *Tribulus alatus* and *Tribulus terrestris* significantly

decreased the blood glucose levels in diabetic rats.

Antioxidant property: *Tribulus terrestris* also has antioxidant properties. In another study, the researchers found that the extract from *Tribulus terrestris* significantly reduce the formation of hydroperoxide, thus implying that this species is powerful natural antioxidants. [5]

BALA^[19]:

Adaptogenic activity: Plant adaptogen are smooth prostressors which reduce the reactivity of host defense system. The mode of action of adaptogens is basically associated with stress system. Adaptogen increase the capacity of stress to respond to the external signals of activating and deactivating mediators of stress response subsequently. The stress induced increase in total WBC count is decreased by SCE, indicating adaptogenic activity (Sumanth Meera.et al., 2009).

Hypoglycemic activity: *Sida cordifolia* used as a weight loss product is through its hypoglycaemic (blood sugar lowering) activity. Research studies have shown that it possesses a significant blood-sugar lowering activity and therefore may help to reduce the storage of fat with fat cells. (Chopra et al., 1956)

Anti –oxidant activity: Dhalwalet *al* studied that all extracts of *Sida cordifolia*. (SC) have effective reducing power and free-radical scavenging activity. Only the root extract exhibited superoxide-scavenging activity and inhibited lipid peroxidation in rat liver homogenate. All these antioxidant properties were concentration dependent. The highest antioxidant activity was observed in the root extract. (Dhalwal et al., 1983).

PANCHAVALKALA^[20]:

An Ayurvedic Management of Vulvovaginitis during Pregnancy
Vulvovaginitis is more common problem of pregnant women that challenges the

gynaecologist. It is an inflammatory condition of the vulva and vagina and characterized by vaginal discharge, pain & itching in external genital organs. Various pathogens are responsible for this condition such as bacteria, parasite, mycotic and virus. Any infection in birth canal may cause premature rupture of membrane and preterm labour resulting in pregnancy loss. Diagnosis is made on the basis of clinical features and presence of pathogens in wet slide study and vaginal swab culture. Treatment depends upon the causative organisms with systemic or local drugs. Aim of study was to see the efficacy of Panchavalkala ointment in vulvovaginitis during pregnancy. Total 50 cases were selected and divided into 2 groups according to the different treatment. Patients were called weekly interval to observe any change and findings were recorded. Results were assessed on the basis of symptomatic relief and absence of pathogens in wet slide study and vaginal swab culture. Panchavalkala ointment is more effective against *Trichomonas Vaginalis* & *E. Faecalis* in comparison to Triclovate ointment.

KANTAKARI^[21]:

Evaluation of Estrogenic Activity Of Alcoholic Extract Of Fruits Of *Solanum xanthocarpum* Using Uterine Wet Weight, Uterine Glycogen Content And Uterine Histology As Parameter Of Assessment

The results proved the estrogenic activity of extracts for dose 200 & 400 mg/kg body weight by exhibiting the significant ($p < 0.05$ & $p < 0.01$) result for various parameters like uterine wet weight, uterine glycogen content and uterine histology. *Solanum xanthocarpum* showed moderate estrogenic activity in a dose dependent manner compared to diethylstilbestrol.

DISCUSSION

Pregnancy and Motherhood comprises greatest moments in a woman's life. Unfortunately, 15% of all clinically

recognised pregnancies result in spontaneous loss and 20%-30% of pregnancies suffer from threatened abortion. The best available data suggest that the risk of miscarriage in subsequent pregnancies is 30% after 2 losses, compared with 33% after 3 losses among patients without a history of a live birth. With respect to this issue, Sushruta in 'Garbhinivyaakaranashareeram' chapter, in the context of 'Garbhasrava' has proposed a unique approach by stating group of drugs specific for the month of abortion up to 7th month of gestation. Acharya also mentions management for 8th, 9th and 10th month of gestation.

Total outcome of review revealed the following: Two possibilities of management could be inferred. One is that of threatened abortion occurring in that specific month. Second mode is of those cases with recurrent pregnancy loss in specific month so that prophylactic management could be undertaken with these drugs in order to get through successfully in the upcoming pregnancies.

Sushruta has mentioned wide range of drugs, the importance of its indications in specific months is yet to be explored. Certain drugs like Madhuyashti, Bala, Kshirivrikshas etc mentioned by Sushruta are also found in Charaka Samhita in the context of management of threatened abortion. This review is an attempt in exploring the importance of indication of these drugs during pregnancy through review of their various research activities related to conditions occurring during pregnancy. More interesting revelation of facts behind the research of these drugs mentioned by Sushruta was registered.

It is very well known that causes of abortion during 1st trimester being 70% chromosomal anomalies, secondly infection, here common infections like TORCH are observed for which there is need for strong anti-inflammatory, anti-bacterial or anti-viral and

immuno-modulatory properties in drugs. Thyroid disease is another condition which can cause abortion. This condition causes hindrance in brain development of the fetus. Another cause being auto-immune disorder where immunomodulatory property has a great role. Hormone imbalance is yet another condition wherein hormone regulation needs to be taken care. Clotting factor is one more cause where there is formation of thrombus which results in abortion for which drugs with 'anti-platelet activating factor' property are indicated. Lastly stress is an important condition caused due to physical trauma, smoking etc where drugs having 'Anti-stress' property are required. Apart from these, drugs which give strength to uterus enhance growth of fetus ending in total reduction of infertility and prenatal complications are the basic needs. Drugs which possess properties like Jivaneeya, Balya, Medhya and Rasayana takes control of these conditions.

Yashtimadhu: A great anti-microbial, anti-fungal, anti-viral and being a good anti-inflammatory can effectively control infection. Not only that, by Rasayana property it maintains optimum nutrition and increases the fertility rate. Research has proved that *Glycyrrhiza glabra* extract may contain many growth factors and energy sources that support the fertility rate and normal development of early cleavage stages of mice embryos *in vitro* which can be utilized for IVF program in mammals^[8].

Shatavari: Kshetrabala is taken care by strengthening uterus in terms of uterine weight and uterine glycogen. *Asparagus racemosus* extract containing formulation was found to cause an increase in uterine weight and uterine glycogen without altering serum estrogen progesterone levels in immature rats as against ovariectomized rats used as control. Study also indicates that the phytoestrogen performs its function by binding directly to the estrogen receptor

without enhancing the endogenous estrogen levels^[22]. Incidentally first trimester Garbhinicharya includes Madhura Oushadhi Siddha Paya and Ghrta. Drugs with Madhura Rasa like Shatavari are having Garbhashtapak (stabilise fetus) property, hence useful to prevent abortions^[23-24]. Therefore it could be always recommended for prophylactic management.

Manjishta: Having 'Anti-platelet activating factor', it checks the abortion due to clotting factor like thrombus formation. Apart from this, it also possesses anti-inflammatory, anti-bacterial, anti-oxidant and anti-stress properties which substantiates its indication.

Kanchanara: A great drug through its hormone regulation can control thyroid dysfunction thus rules out thyroid involvement and hormonal deficiency causing aspects. Researches proved ethanolic extract of the stem bark of *B. variegata* showed immunomodulatory activity on the primary and secondary antibody responses. Thus proving its dual role in TORCH infection and immunological defects causing abortion.

Others like Kshiravidari, Kshirakakoli, Sariva and Devadaru through their Jivaneeya, Balya, Medhya and Rasayana properties contribute in preventing abortion and maintenance of pregnancy.

Similarly the causes for second trimester abortion which includes mainly anatomical abnormalities like cervical incompetence, Uterinesynechia, Uterine fibroid needs drugs which can strengthen the uterus and protect the fetus securely. Indication of drugs which possess Kashaya rasa (tannins) may help in stabilising os in case of cervical incompetence by strengthening and toning up of uterine muscles. Conditions like bacterial vaginosis could be taken care by drugs with anti-inflammatory and anti-bacterial properties. Maternal HTN and uncontrolled diabetes which are commonly found during second trimester need drugs

with properties such as Anti-hypertensive, Adaptogenic, hypoglycemic and vasodilation property.

Gokshura: This drug having multi-faceted action has a great role to play in pregnancy especially during second trimester. Maternal HTN and gestational diabetes being common complications during second trimester, gokshura with its anti-hypertensive, vasodilation, hypoglycemic and hypolipidemic properties helps in effective management of these conditions. The antihypertensive effects appeared to result from a direct arterial smooth muscle relaxation possibly involving nitric oxide release and membrane hyperpolarization^[25]. This drug also has 'Smooth muscle relaxant property' which helps in preventing premature labour. Its anti-oxidant property helps in smooth maintenance of pregnancy without any complications. The significant increase in reproductive organs weight collectively (ovaries, oviducts and uterus) may be caused by antioxidant activity of the extractor by some *TT* aqueous extract contents such as saponins (disgenin) and sterol (β -siosterol, stigma sterol) which contain phytoestrogen. The metabolites of phytoestrogen exert an estrogenic effect on central nervous system which induces estrus and stimulates cell division and growth of genital tract of female animals. Due to presence of weight of fetus and other causes edema, albuminuria etc may lead to Pre-eclampsic Toxaemia in third trimester. Gokshura being a diuretic is the drug to prevent Pre-eclampsic Toxaemia prophylactically.

Bala: It is a common and very safe drug indicated in pregnancy. Its hypoglycemic property helps in effective management of gestational diabetes. This being a powerful natural anti-oxidant and adaptogenic, help in preventing many complications.

Panchavalkala: Indication of Panchavalkala in second trimester proves

with a strong reasoning since it possess kashaya rasa (tannins) which help in strengthening and toning up of uterine muscles in turn resulting in stabilising os in case of cervical incompetence. Researches have proved its efficacy in the management of vulvovaginitis infection in pregnancy.

Yashtimadhu: The cortisol-like effect of licorice root has shown to support healthy blood sugar levels, especially when taken first thing in the morning. This may be helpful for women with insulin resistant PCOS. Licorice is emollient, demulcent and nutritive. These actions support healthy mucus membranes and enhance their function, including those that secrete cervical mucus. Yashtimadhu with strong anti-inflammatory property is useful in bacterial vaginosis condition.

Bhrati-Kantakari: Researches have proved that kantakari has estrogenic activity with parameters like uterine weight and uterine glycogen thereby strengthening the uterine muscles.

Others include Shigru which is rich with nutritional value like Vitamin A, C, Calcium, Potassium, Protein etc supply the nutrients that are needed to carry on pregnancy. Prishniparni and Kashmari being good Rasayana, one of the most important quality needed throughout pregnancy justifies their indication. Ghrta which is widely indicated throughout pregnancy anoints and helps in smooth stretching of reproductive muscles which is very much required during fetal growth. The leaf buds of latex yielding trees (Kshiri Shunga) through their strong styptic action help in stopping bleeding in case of threatened abortion.

The causes for complications during third trimester include Gestational Diabetes, IUGR, Preterm labour, Premature rupture of membranes, Malpresentation, Preeclampsia etc. Drugs which contain steroids play a vital role in fetal growth as well as in lung

development of fetus thereby preventing complications of preterm labour. Drugs that improve circulation to the fetus from placenta through umbilical artery are required in IUGR condition. In case of Preterm labour, Premature rupture of membranes and Abruptio placenta, drugs which give continued support to the uterus to take pregnancy up to full term are needed. In case of Malpresentation and Post-maturity, Vatahara drugs that can cause natural version and timely induction of labour respectively are required. In case of Pre-eclampsia, drugs that which can check over weight, HTN, Albuminuria and edema are needed. Drugs with Antioxidant activity prevents PIH by preventing placental peroxides which otherwise may lead to endothelial cell damage which further can cause an imbalance between vasodilators and vasoconstrictors leading to PIH (Bhosale 2000). The Rasayana property also helps in modulating various immune processes at placental level. The Anti ADH activity of drugs indicated helps in maintaining blood pressure and decreasing edema of pregnancy by causing diuresis^[15]. Apart from this, drugs possessing Jivaniya, balya and rasayana properties contribute in enhancing the growth of fetus and overall maintenance of pregnancy.

Shrungataka: Being a very good nutritional source, is mainly advised for its Rasayana property. It contains carbohydrates and vitamins, namely, Vitamin B-complex (thiamine, riboflavin, pantothenic acid, pyridoxine, nicotinic acid), vitamin-C, vitamin-A, D-amylase, amylase, and considerable amount of phosphorylase. It mainly gives strength thereby preparing the body to withstand the stress that the woman could undergo during pregnancy.

Brhati-Kantakari: These are drugs belonging to Solanaceae family containing phytosterols which supplements steroidal effect in progressing the lung development of fetus thereby preventing the complications in fetus in case of preterm labour.

Yashtimadhu: A wonder drug which is indicated by Sushruta in all stages of abortion, this drug due to its high quality Rasayana property and growth enhancing factors help in enhancing the fetal growth and thus leading to Eutocia.

Shatavari: The other drug stressed by Sushruta, its rasayana as well as antioxidant activity helps in modulating various immune processes and also prevents lipid peroxides at the placental level^[15]. The polycyclic alkaloid asparagine A is also reported to have an antioxytocicaction^[26], thereby preventing preterm labour. Research has proved Shatavarin-I^[27] blocks even oxytocin induced contractions in rat, guinea pig and rabbit uteri in vivo and in situ in a dose dependent manner. The researchers also confirmed that the in vivo effect of shatvarin IV on the uterine muscles is just like the estrogen^[15]. Researches have proved that shatavari has a great role to play in PIH. PGI₂ and NO are important vasodilators; a deficiency of these can lead to PIH. Essential fatty acid GLA (Gamma linolenic acid) of A.R. is known to produce PGI₂ in preference to TXA₂. It also has Anti ADH activity which helps in maintaining blood pressure and decreasing edema of pregnancy by causing diuresis^[15].

Others include Draksha which through its strong anti-oxidant properties justifies its indication. Ikshu with its diuretic property helps in conditions like Pre-eclampsia. Bisa(Lotus stalk) is one of the excellent sources of vitamin-C. Vitamin-C is a powerful water soluble antioxidant. It is

essential for the collagen synthesis inside the human body. Collagen is the main structural protein inside the body, required for maintaining the integrity of blood vessels, skin, organs, and bones.

CONCLUSION

The research update of drugs mentioned by Sushruta with respect to abortive tendency is attempted.

1. The elaborate description of management of bleeding/abortion occurring in different months of pregnancy is confirmed.
2. Abortive tendency in any month is very well tackled through specific group of drugs.
3. The research review reveals that every drug mentioned by Sushruta has its own contribution in combating different causes of abortion.
4. Yashti, proved to be a wonderful and safe drug which could be prescribed throughout pregnancy.
5. Shatavari, the next recommended drug proved to be an effective anti-abortifacient and ante-natal tonic.
6. Similarly, all other drugs justified their indications in different trimesters through their specific properties revealed through research papers.
7. This review also gives a clue that this specific group of drugs could be used as prophylactic in management of recurrent pregnancy loss in order to prevent complications in the upcoming pregnancies.
8. This approach of prescribing drugs specific to every month during pregnancy is unique.
9. This review article with an evidence-based approach proves the authenticity of these classically recommended drugs even to this day.

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