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AYURVEDIC FORMULATIONS IN THE MANAGEMENT OF INTRAUTERINE GROWTH RETARDATION – A REVIEW

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ABSTRACT
IUGR is an abnormal process in which the development and maturation of the fetus is impaired or delayed. The present review is carried out to compile the classical formulations of Ayurveda reported for their effect in the management of IUGR (intrauterine growth retardation). Reported research works from various National & International journals, souvenirs, books and web based search engines were compiled and presented in a systematic manner. It is observed that, total 5 clinical studies and 1 case study have been reported on management of IUGR by using Classical formulations of Ayurveda. Different classical formulations such as *Madhumalini Vasanta Rasa*, *Laghumalini Vasanta Rasa*, *Brimhaniya Gana Kshirapana* and *Kshira Basti*, *Vidarikanda Siddha Ghrita*, *Bala Siddha Ghrita*, *Shatavari Kshira Basti* were studied for their efficacy in the management of IUGR. These medications showed effective results in increasing the maternal weight gain, fundal height, abdominal girth. Increase in fetal biometry, amniotic fluid index and baby weight was also observed in most of the studies. These formulations can be effectively utilized by Ayurvedic obstetricians in the management of cases of intrauterine growth retardation.

KEYWORDS: Ayurvedic formulations, Fetal nourishment, IUGR.

INTRODUCTION
Intrauterine growth retardation (IUGR) is a term used to describe the condition of a fetus whose size or growth is subnormal. A fetus is growth restricted if its weight is less than 10th percentile for its gestational age.[1] The main features being poor maternal weight gain, discordance between gestational age and uterine size; and may be associated with reduced fetal movements.[2] Growth retarded fetuses have 8 - 10 fold increase in perinatal mortality and 50-75% morbidity compared to appropriately sized fetuses. This is mainly because of lack of efficient medications in the treatment IUGR.

Ayurveda Acharyas have mentioned *Garbhavyapads* related to the fetal growth restrictions such as *Upavishtaka*, *Upashushka*, *Garbhshosha*, *Garbhakshaya*[3] etc. In accordance to the treatment principles of these *Garbhavyapads* mentioned in Ayurveda, various drug combinations possessing anabolic, nourishing, strengthening etc. properties could be pertinent in the management of IUGR.

Need has always been there to develop Ayurvedic treatment modalities for the management of IUGR which could be safe, effective, readily available, cost effective without any side effects. With this background, an effort is made to systematically compile and review the works carried out on certain Ayurvedic formulations in the patients of IUGR, to increase the fetal growth & development in womb.

MATERIALS AND METHODS
Different clinical research works related to management of IUGR through Ayurvedic drugs carried out in various Ayurveda institutions and published in National and International journals, souvenirs are compiled and analyzed critically. The available data is presented systematically with regard to the various treatment modalities practiced in the management of IUGR.

OBSERVATION AND RESULTS
It is observed that, 5 clinical studies and 1 case study have been carried out for the management of IUGR using classical Ayurvedic drugs. Total 6 formulations were studied and found effective in the management of IUGR.

Table. 1: Classical Ayurvedic formulations studied for their effect on IUGR.

S. No.	Formulation	Dose
1	*Madhumalini Vasanta Rasa*	125 mg BD
2	*Laghumalini Vasanta Rasa*	250 mg BD
3	*Brimhaniya Gana Siddha Kshirapana*	80 ml orally (once a day)
	Brimhaniya Gana Siddha Kshirabasti	400 ml rectal route (once a day)
4	*Vidarikanda Siddha Ghrita*	10 ml BD
	Standard protein supplement	5 gm BD
5	*Bala Siddha Ghrita*	10 ml BD
6	*Shatavari Kshira Basti*	500 ml rectal route (once a day)
	Laghuvasantamalati Rasa	250mg BD
	Rasayana Churna (a combination of *Guduchi*, *Gokshura* and *Amalaki*)	5g BD
	Chandraprabha Vati	2 BD

1. *Madhumalini Vasanta Rasa*

In a clinical study, 101 diagnosed patients of *Upavishtaka*/IUGR were divided into two groups by lottery method. Trial group of 50 patients received Tab. *Madhumalini Vasanta* 125 mg BD early in the morning and at bed time with water. Cap. Amino acids 1 BD was administered to control group having 51 patients. Treatment was continued upto delivery. It was observed that, increase in height of the uterus per week was 0.86 cm in control group while in trial group 1.08 cm which was highly significant. Mean birth weight of baby in control group is 2330 gm and in study group it is 2676 gm. Comparison of both groups showed very significant result in trial group ($p<0.0001$). Symptoms like *Agnimandya, Adhmana, Urodaha, Udarashoola, Malavastambha, Drava Mala,* and *Katishoola* were decreased in study group after treatment while in control group some symptoms like *Adhmana, Urodaha, Malavashtambha* and *Drava Mala* were increased. Weight of mother and height of uterus increased significantly with *Madhumalini Vasanta* in IUGR cases.[4]

2. *Laghumalini Vasanta Rasa*

In a clinical study, 20 patients clinically diagnosed with IUGR completing 16 weeks gestational period were administered with Tab. *Laghumalini Vasanta* 1 BD (each of 250mg) for a period of 1 month. The results were highly significant in parameters like maternal weight ($p<0.001$), fundal height ($p<0.001$), abdominal girth ($p<0.001$), fetal weight ($p<0.001$), amniotic fluid index ($p<0.001$). Patients with pregnancy induced hypertension & severe oligohydramnios showed satisfactory improvement. *Laghumalini Vasanta Rasa* showed potent effect in the management of *Upavistaka* (IUGR).[5]

3. *Brimhaniya Gana Siddha Kshirapana & Kshirabasti*

In a clinical study, pregnant patients completing 28 weeks of gestation, having signs of *Garbhashosha*/IUGR were randomly divided into 2 groups, wherein 30 patients in trial group were administered *Brimhaniya Gana Siddha Kshirapana* in the dose of 80 ml by oral route and 400ml *Brimhaniya Gana Siddha Kshirabasti* by rectal route, daily for a period of 15 days. 30 patients in the control group were given Inj. Alamine SN 200ml by intravenous route on every 4th day of five consecutive cycles and Cap. Alamine Forte orally twice a day for 15 days.

It was observed that in both trial and control group, maternal fundal height, abdominal girth and fetal abdominal circumference, amniotic fluid, fetal weight, ponderal index showed highly significant improvement ($p<0.001$). *Upashaya* was seen in 25 patients (83.33%) of trial group and 21 patient of control group (70%). *Brimhaniya Gana Sidha Kshirabasti* and *Kshirpana* can be given in IUGR condition to improve the growth parameters without any complication.[6]

4. *Vidarikanda Siddha Ghrita*

In a clinical study comprising of 60 patients in their gestational age between 28-34 weeks, diagnosed with *Upavishtaka/*IUGR were divided into 2 groups randomly. Trial group consisted of 30 patients, who were treated with *Vidarikanda Siddha Ghrita* 10 ml twice a day along with the standard protein supplement 5 gm BD after food and 30 patients in control group were treated with standard protein supplement 5 gm BD. Treatment was carried out upto delivery in both the groups. The trial drug showed maximum benefit when compared to control group in maternal parameters such as fundal height, abdominal girth and weight gain; and in ultrasound based parameters such as ponderal index, difference in growth lag and fetal growth rate. In trial group 28 patients (93.33%) and in control group 20 patients (66.67%) got *Upashaya. Vidarikanda Siddha Ghrita* along with protein powder showed better effect over protein powder alone in the treatment of *Upavishtaka*.[7]

5. *Bala Siddha Ghrita*

In a clinical study of 10 pregnant patients clinically diagnosed as IUGR / *Upvishataka* completing their 16 weeks of pregnancy were treated with *Bala Siddha Ghrita* 10 ml BD till delivery. There was marked improvement in the maternal physical and mental feeling of wellbeing. The results were highly significant in symptoms like maternal weight ($p<0.001$), fundal height ($p<0.001$), abdominal girth ($p<0.001$), fetal weight ($p<0.001$).There was good response of *Bala Siddha*

Ghrita in *Upavistaka* without any adverse effects. It is also economical and effective remedy for the management of *Upvishtaka* (IUGR). *Bala Siddha Ghrita* is safe and effective treatment in the management of *Upvishtaka* (IUGR).[8]

6. *Shatavari Kshira Basti*

In a case study, a 22 year old primi gravida in her 33 weeks of gestation presented with the complain of lower abdominal pain and p/v leaking. On examination, fundal height was less than the period of gestation with a lag of 2 weeks, uterine contraction was also noticed. P/v examination revealed intact membrane with no leaking, head low lying. USG reports showed 31 weeks gestation and estimated birth weight of 1.9 kg. The patient was prescribed with *Laghuvasantamalati Rasa* 250mg BD, *Rasayana Churna* (a combination of *Guduchi*, *Gokshura* and *Amalaki* 3g each) 5g BD and Tab. *Chandraprabha Vati* 2 BD. *Shatavari Kshira Basti* 500ml was administered once in the morning for 15 consecutive days. Within 2 days of drug administration, pain abdomen and watery discharge per vagina was relieved.USG after the completion of *Basti* showed 34 weeks gestation with estimated fetal weight of 2.3 kg. This single case study demonstrates the efficacy of *Shatavari Ksheera Basti* in the efficient management of IUGR in increasing the fetal weight, maternal abdomen size and also in subsiding premature contractions.[9]

DISCUSSION

IUGR is a condition where *Vata* is the chief *Dosha* involved in pathogenesis. This aggravated *Vata* further vitiates *Pitta* and *Kapha Doshas*; obstructing the *Rasavaha* channels which carries nutrition to the fetus. This blockage in the supply of nutrition results in the desiccation of fetus and leads to the condition known as IUGR.

The ideal treatment for this ailment should be comprised of drugs which not only give complimentary nutrition to the fetus but also break the pathogenesis at the level of etiology and pathology.

Madhumalini Vasanta Rasa does *Agnideepana*, *Pachana* and *Rasadhatvagni Vardhana* thereby leads to *Rasadhatu Utpatti*. *Raktaprasadana* and *Hridya* properties of the drug cause *Rasavikshepana*. *Sukshma Strotogamitwa* and *Pramathi* qualities of the drug, increase *Upsnehana* in *Apara* and in *Garbha Nabhi Nadi*. *Madhumalini Vasanta Rasa* also increases uterine circulation and provides *Pushti* and *Poshana* and thus is very effective in causing *Garbhavruddhi.*

Laghumalini Vasanta Rasa is one of the *Vasantakalpa* which is *Madhura, Balya, Garbhapohsaka* & *Garbhavriddhikara*. The *Laghumalini Vasanta* contains *Shudha Kharpara, Maricha* with *Navanita*. *Kharpara* acts mainly on *Rasavahini & Rasadhatvagni*. It also acts on *Agnimandya* and aids in breaking the disease pathology. Hence it is very effective in treatment of fetal growth restricted conditions.

The drug formulation *Brimhaniya Gana Sidha Kshira* has dominance of *Snigdha, Sheeta, Guru Guna, Sheeta Virya, Madhura Rasa, Madhura Vipaka, Pruthvi-Ap Mahabhutadhikya, Vata Shamana* and *Anulomana* properties which leads to *Agnideepana* and *Dhatu Vriddhi*, it boosts *Prakruta Ahara Rasa Nirmana, Prakruta Rasadhatu Nirmana* and *Rasaprasadana*. In this way the aim of *Garbhavriddhi* is achieved.

Ghrita preparations having *Madhura Rasa, Snigdha Guna* predominance is beneficial in subsiding the *Vata*. *Vidarikanda Siddha Ghrita* and *Bala Siddha Ghrita* have *Madhura Rasa, Madura Vipaka, Sheeta Virya, Singdha Guna* and *Vatpittahara* properties*;* possess *Balya* and *Brimhaniya Guna*. It has *Mamsa* and *Rasa Gamitva* so it acts as *Mamsa* & *Rasa Vardhaka. Ghrita* also acts as *Snehana, Deepana, Agnivardhaka* which leads to *Rasavardhana* & ultimately acts as *Garbhaposhana*.

Shatavari Kshira Basti administered through rectal route enhances the drug absorption and bio availability. *Shatavari* is having *Rasayana* property and improves *Rasa Rakta Mamsa Dhatu* along with adaptogen and antioxidant properties and aids in the formation of healthy fetal tissues. *Shatavari* also possesses antioxytocic property and thereby it even prevents premature contractions.

CONCLUSION

This review summarizes the evidence underlying the usage of various Ayurvedic treatment modalities, orally in the form of *Vati*, *Kshirapana* and *Ghrita* and per rectal route in the form of *Basti* for efficient management of IUGR. Supplementing appropriate drugs having anabolic, tissue building etc. properties proves to be effective in increasing the maternal and fetal growth parameters and may prove as a great contribution to Ayurveda obstetrician in the management of IUGR.

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