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Case Study

MANAGEMENT OF INTRA UTERINE GROWTH RESTRICTION WITH MONTH WISE *KSHEERA KASHAYA*

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ABSTRACT

Intrauterine Growth Restriction (IUGR) is a main health condition affecting pregnant women and its outcomes are perinatal mortality and morbidity. In the prevailing case a 38 year-old Multi gravida who undergone regular ante natal check-up was detected with Intrauterine Growth restriction at 21 weeks of gestation. The estimated weight of the foetus was found less than 19 percentile and there has been oligohydramnios, pleural effusion and increased pericardial fluid to the foetus on additional evaluation. She was given allopathic control initially; however, the circumstance remains unchanged. She turned into Ayurveda and was handled with the treatment principles of *Garbhasosha* (foetal emaciation). She was managed by month wise medicated *Ksheera kashaya* (milk decoction) for *Brimhana* (nourishing) and pacifying *Vata*. She delivered a full term healthy female baby of weight 2.57kg through a Lower Segment Caesarean Section. The prognosis by the allopathic system was poor in this case and there are no interventions in their system to improve placental perfusion. In this case the condition was achieved through month wise treatment and specification of Ayurvedic formulations. Completed in a brief span of time, thereby stopping the want for early delivery and the persisted until 39 weeks of gestation. Being a term delivery, the need for neonatal extensive care was no longer arising. The cutting-edge method shows that Ayurveda is tremendously powerful in intra uterine growth restriction and its complications. This case opens the scope for additional studies within the region of Intrauterine Growth Restriction with Ayurvedic drug treatments.

INTRODUCTION

Intra Uterine Growth Restriction (IUGR) is a condition where the foetus fails to reach its genetics growth potential and consequently is at increased risk of perinatal morbidity and mortality. This may result in foetus which is small for gestational age. IUGR or foetal growth restriction (FGR) is defined as a condition where the foetal weight is below the 10th percentile for gestational age. The appropriate reference is to use the 'normal' ranges for the local population since there may be ethnic variation. [1]

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The phase of concomitant hyperplasia and hypertrophy occurs between 16-32 weeks, and involves increase in cell size and number.

The cellular hypertrophy phase occurs between week 32 and term and is characterised by a rapid increase in cell size. During this phase, most of the foetal glycogen and fat deposition takes place.

There are Symmetrical and Asymmetrical types of IUGR. Type I or symmetrical or accounts for 20%-30% of IUGR and it occurs as a result of inhibition, early in pregnancy. It refers to a growth pattern in which all foetal organs are decreased proportionally due to impairment of early foetal cellular hyperplasia.

Type II or asymmetric or extrinsic IUGR account for 70%-80%. It is characterised by a relatively greater decrease in abdominal size than the head circumference and occurs as a result of uteroplacental insufficiency. Chronic hypertension, vasculopathy and renal diseases are the major causes

of IUGR. Asymmetric growth occurs due to the redistribution of blood flow in favour of vital organs like brain, heart, placenta etc. at the expense of non-vital foetal organs like abdominal viscera, lungs, skin, and kidneys. This type leads to chronic hypoxia, and foetal death sets in. Intermediate IUGR is also there which is a combination of both and is seen in 5%-10%.

IUGR is observed in about 24% of new-borns; approximately 30 million infants suffer from IUGR every year. 75% of affected infants are reported from Asia. Africa and Latin America account for 20% and 5% cases respectively. In India, the prevalence has been reported as 26%, while the proportion of IUGR has been found to be 54%. [2]

Causes of IUGR can be maternal, placental or foetal. Maternal risk factors include maternal malnutrition, constitutionally small mothers, chronic maternal hypoxemia, prothrombotic disorder, hypertension and cardiovascular disease, infection, drug abuse and smoking, chronic maternal stress. Placental factors include uteroplacental insufficiency, collagen vascular disease, anti-phospholipid antibody syndrome, inherited thrombophilias, and placental cord anomalies like placental abruption circumvallate placenta. Foetal factors include congenital malformation, foetal infection, and chromosomal abnormalities. The complication includes metabolic issues like hypoglycaemia, hypothermia, hypocalcaemia, foetal distress and meconium aspiration, pulmonary haemorrhage and lastly intrauterine death [3].

In Ayurveda, growth retardation disorders are termed as *Upavishtaka garbha vyapath*. It is due to abnormal nourishment of foetus from mother and is caused due to *Varjyamnya dravya prayoga*, (usage of contraindicated substances) specifically *Ushna, Theekshna dravya*, *Pushpa darshanam* and *Yoni srava* (vaginal discharge). Due to this, *Vata* is vitiated by excessive bleeding withholds *Pitta* and *Sleshma* and constricts the vessel that nourishes foetus. It results in stunted growth, delayed labour initiation, no growth in abdomen.[4]

As *Upavishtaka* requires *Brimhana, Vataghna chikitsa*[5] we adopted month wise *Ksheera kashayas* explained in *Garbha vyapath adhyaya* of Ashtanga Hridayam.[6] The drugs mentioned in month wise *Ksheerakashayas* are beneficial for the monthly development of the foetus. During first months, the drugs mentioned are to prevent abortion, and in later months to promote growth and development of cardiovascular and nervous system etc. the drugs mentioned in last months are helpful in commencement of uterine contraction and delivery of a healthy baby.

In this study, month wise *Ksheerakshayas* and dietary advices are given to the patient from 22 week up to 39 week 5 days of gestation (term delivery).

Case Report

A 38-year-old multigravida lady of 22 weeks came with intra uterine growth restriction on further evaluation it was diagnosed with foetal complications like increased Pericardial Fluid, Pleural Effusion and reduced amniotic fluid. She has a history of 2 intra uterine foetal death in second trimesters. She has 19 % decreases in foetal weight.

Personal History	**Status**
Appetite	Less
Diet	Vegetarian, Wheat based
Bowel	Soft
Micturition	Increased frequently
Sleep	Disturbed
Allergy	Nil
Addiction	No
Exercise	Walking
Occupation	IT- sitting for long hours

Menstrual History	LMP-26.08.21
Menarche	14 years
Interval	30-35 days
Duration	6 days
Amount of bleeding	2-3 pads/ day
Clots	Occasional

Associated complaints	Mild dysmenorrhea
Obstetric History	
Gravidity	5
Term	1
IUFD	2
SAB	1
Living	1
Ectopic	Nil
Marital history	
Marriage	12 years
Sexual history	No dyspareunia
Contraceptives	No permanent measures

Antenatal Impressions

Date. POV (estimated by LMP)	Findings
Jan 25 (21 weeks 5 days)	19 weeks 6 days Foetal heart rate 149 Amniotic fluid low Estimated Foetal weight - 290 grams Placenta – anterior PA 1 4G/4G polymorphism HLA mismatch between partners Echogenic bowel and low fluid
Feb 8 (23 week 5 days)	22 week 0 days Foetal weight is 461 grams at 19% low for 23 week 5 days Presentation is breech Placenta - anterior Foetal heart rate - 169 Elevated pericardial fluid and pleural effusion Heart and ventricle- limited but previously seen in USG
Feb 21 (25 weeks 4 days)	23 week 2 days Foetal heart rate - 162 Presentation is vertex Cardiac activity visualised Cord insertion – central Foetal weight - 551 grams 12% percentile low for 25 week 4 days Doppler – umbilical artery 16% percentile Middle cerebral artery 45%tile and PSV is 38.3 No evidence of pleural effusion or abnormal fluid collection
April 5 (31 week 5 days)	30 week 3 days Foetal weight 14% percentile low (good foetal growth) Abdominal circumference < 3% Umbilical artery S/D ratio normal
April 19 (33 weeks 5 days)	31 week 6 days Foetal heart rate – 157 Estimated foetal rate 1625 grams 11% percentile low Abdominal circumference < 3%

	Biophysical score 8/8
May 4 (35 weeks 6 days)	33 week 5 days Estimated foetal weight 2126 grams 10% low Doppler of umbilical artery is reassuring Amniotic fluid volume is within limit
May 12 (37w 0 day)	35 w 1 d EFW -2375 gm BPP –8/8

Ayurvedic management given

Time	**Medicine**	**Form of administration**	**Dose**	***Anupanam***	**Duration**
5th month (16-20 weeks)	*Bruhati dwaya, Gambari, Ksheerivriksha twak*	*Ksheera kashaya*	60ml twice daily	Ghee	1 month
6th month (20-24 weeks)	*Prishniparni, Bala, Shigru, Swadamstra and Guduchi*	*Ksheera kashaya*	60ml twice daily		1 month
7th month (24-28 weeks)	*Sringataka, Visa, Draksha, Kaserukam, Madhuka*	*Ksheera kashaya*	60ml twice daily	*Sita*	1 month
8th month (28-32 weeks)	*Kapitha, Vilwa, Bruhathi, Patola, Nidhigdhika*	*Ksheera kashaya*	60ml twice daily	*Sita*	1 month
9th month (32-36 weeks)	*Sariba, Anantha, Payasya, Madhuyashti*	*Ksheera kashaya*	60ml twice daily		1 month
10th month (36-40 weeks)	*Yashtimadhu, Nagara, Devadaru*	*Ksheera kashaya*	60ml twice daily		1 month

Diet Advised

Take tender coconut water daily with cardamom.

Cucumber, brinjal, milk and milk products, dry fruits and nuts should be added to the diet.

RESULT

After 21 days pericardial fluid and pleural effusion were under control. Weight loss percentile is improvised from 19 percentile to less than 10 percentiles. Patient delivered a healthy baby on May 24, 2022, in her 39 weeks 5 days with weight 2579gm.

DISCUSSION

IUGR was correlated with *Upavishtaka* mentioned in Ashtanga Hridhaya. In Ayurveda classics growth related *Garbhavyapath* mainly includes *Garbha shosha, Upavishtaka, Nagothara* and *Leena garba*. Acharya Charaka explains that the nourishment of the foetus occurs by *Upasneha* i.e., permeation of the *Guru* and *Snigdha dravyas* (dense nutritious materials) like glucose, lipid by-products and protein by-products. Also, it occurs by *Upasweda* i.e., permeation of less heavy nutritious materials like vitamins, enzymes and gases like O_2-CO_2 exchange. It may be correlated to the process of simple diffusion and osmosis.[7]

As *Upavashitaka* is mentioned in *Garbha* vyapad chapter of Ashtanga Hridya *Shareera sthana* we took this as the reference for treatment.

During 5th month internal tendons of heart, sensory motor apparatus is developed; as the heart is the seat of consciousness (*Chetanescha panchame*) and start to receive various stimuli so foetus exhibits more mental activity. As Charaka says that *Mamsashonitho-pachaya* occurs in 5th month any impairment in blood circulation results in IUGR. Here due to pericardial effusion, vision of heart was limited in USG scan. To support these activities the combination of *Brihatidwaya- Kashmarya -Ksheeri sringa Twacho* & *Gritham* was adopted in the form of *Ksheera kashaya*.

Brihatidwaya (*Solanum indicum* and *Solanum xanthocarpum*) helps to maintain fluid balance in the body and effective against bacterial infection it is also *Hridhyam* and *Garbhasthapaka* (inhibit uterine smooth muscle contractions.[8] It controls amniotic fluid formation. *Gambhari* (Gmelina arborea) which have diuretic action maintains fluid balance and accelerates the venous drainage. [9] It is *Garbha sthapaka* and *Vrshya* in nature. *Vatavriksha* (Ficus benghalensi) enhances foetal growth by improving foeto-placental circulation. The bacteriocidic properties of *Ksheeri*

vriksha keep the infections on check. Placenta being lipophilic helps easy transportation of nutrients along with ghee. It is also *Deepana, Pachana, Balya* and *Vatapitha samanam* and helps to improve brain development as it mentioned as *Dee dhriti smrit medha krit*. It is also *Ayushyam* (longevity) and *Vaya stapanam param* (increases life span). [10]

As per Susrutha, during 6th month the marked development of lungs and foetal movements become vigorous. Foetus require more beneficial effect in Rasa, *Raktha, Meda, Majja, Manas* and metabolism, so herbs that help in development of later was given. *Prishniparni* (*Uraria picta*) due to its *Tikta Madhura*, *Ushna* and *Laghu guna* helps in *Vataharatwam* and Hridyam. The glycosides present in *Uraria picta* have cardio and renal protective property with bactericidal action.[11] *Bala* (*Sida cordifolia*) is *Saptha dhathu vardhanam* (promotes tissue level growth) and induce *Bala upachyam* (promotes strength) in foetus. It also possesses the Karma of *Garbhastapaka*, *Balya* and *Hridya*. By its *Madhura*, *Laghu*, *Snigdha pichila guna*, it acts as a nerve tonic also. It has properties like antioxidant, anti-inflammatory, antibacterial and cytotoxicity activity of the plants.[12] *Shigru* (*Moringa oleifera*) is a rich source of calcium with iron, Vit A, Vit B, Vit C, potassium, copper and other micro nutrients.[13] Along with its *Mutrala* property it maintains the electrolyte balance in the body. As *Swadamshtra* (*Tribulus terrestris*) contain a saponin named protodiosine[14] a chemical constituent which helps in increasing muscle mass growth in foetus by improving blood circulation. *Guduchi* (*Tinospora cordifolia*) which is *Rasayana*, *Hridhya* improves the foetal circulation and helps to absorb more nutrition from mother's blood.

During 7th month, all the different body parts are conspicuously evident. So, drugs possessing properties like *Balya, Garbastapaka, Ojo vardhaka* and immunomodulation were taken. *Sringataka* (*Trapa bispinosa*) is a very good immunomodulator and *Garbhasthapaka* which helps to prevent preterm or premature labour. *Bisa* which is commonly known as *Kamal khatta* is rich source of calcium, iron, zinc and proteins. Here zinc provides cytoprotection by its anti-oxidant property. *Draksha* (*Vitis vinifera*) which is an amble source of folic acid, Vit A, Vit B2, Vit B6, Vit C. Especially Vit B6 increase birth weight, reduce incidence of pre-eclampsia and preterm birth and hence result improve in APGAR Score. *Kasheruka* (*Sciprus grossus*) has abundant source of progesterone and amylase. Amylase is an enzyme that digests carbohydrates which results in higher absorption of nutrients. *Madhuka* (*Glycyrrhiza glabra*) one among four *Medhya, Rasayana* contains B-glycyrrhetinic acid which helps in immunomodulatory property and that function as *Garbhasthapaka*.

In 8th month *Ojo asthirathvam* occurs between mother and baby that cause severe tiredness in mother. *Kapitha* (*Limonia acidissima*) commonly known as wood apple which is the only *Amla rasa dravya* mention in *Garbha vyapath ksheera kashaya*. Coumarin present in *Kapitha* which act as anticoagulant that effective in condition with PAI-1 polymorphism. Aminoacids in Limonia acidissima helps in protein synthesis and potassium stimulate nerve conduction. *Bilwa* (*Aegle marmelos*) is a cardioprotective, cardio protective and hepatoprotective drug.[15] By its *Rasaguna veerya vipaka* it acts as *Garbhsaya sothohara*. *Patola* (*Trichosanthes dioica*) have minerals like magnesium, sodium, potassium, copper, and sulphur, vitamins, tannins, saponins, alkaloids, glycosides, flavonoids, steroids, pentacyclic triterpenes, and other bioactive compounds have proven that the *Patola* is pharmacologically important[16]. *Ikshu*, (*Saccharum officinarum*) helps in milk production, cardio protective and energiser. Oreintin present in sugar cane which is an anti-oxidant, cardioprotectant, neuroprotectant, antinociceptive in nature, which helps in normal foetal growth promotion [17]. Solanum xanthocarpum in 8th month have Hepatoprotective activity, Lupeol, apigenin and solamargine from *Solanum xanthocarpum* exhibited anticancer property. Ethanolic extract of *Solanum xanthocarpum* have anti histaminic property which helps in lung development.[18] It improves feto-placental circulation and maintains good cardiac activity.

9th and 10th month is considered as *Prasavakaala* in Ayurveda. *Sariba, Anantha, Payasya* and *Madhuyashti* are *Jivaneeya, Bruhmaniya* and *Balya* which helps in rapid weight gain in foetus. *Nagara* and *Sura dharu* which is *Katu* (pungent), activates *Apanavayu* which further manifests *Upastista prasava* (1st stage of labour). And *Yastimadhu* activates uterine contraction.

As all the medicines are prepared in the form of *Ksheerapaka* (milk decoction), the involvement of milk is very important here. Cow's milk is high in calcium, phosphorus, magnesium, potassium, sodium and Vitamins. Milk is not just a nutrient, but represents an endocrine signalling system of mammals activating the key regulator of cell growth and anabolism. Milk increases the placental weight and promotes placental nutrition transfer which helps in appropriate foetal growth. Milk consumption increases pregravida, gestational, placental, foetal, and birth weight, respectively [19]

Tender coconut water is the liquid endosperm present in the cavity of the coconut fruit and contains amino acids, Vitamin B Complex, Vitamin C, 95.5% water, 4% sugars, 0.1% fat, 0.02% calcium, 0.01% phosphorous, 0.5% iron etc. *Ela* (Cardamom) is

indicated in *Kshaya* (weakness), it is also *Hridya* (cardio tonic) and *Deepana* (increases digestive fire). Tender coconut water was advised since it is highly nutritious and cardamom was added to it as *Anupana* (adjuvant) as it helps in better digestion and absorption.[20] Vegetables like cucumber and brinjal helps to increase the mucous[21] content in the body which in turn optimises the amniotic fluid volume.

CONCLUSION

- IUGR is an important health problem of developing countries around the world. The month wise foetal developmental which is impaired in IUGR, can be corrected with *Ksheera kashaya* mentioned in *Ashtangahridaya Garbhavyapath* chapter was found beneficial in preventing further IUGR and its complications.
- This case study can be used for further evaluation of the efficacy of the drugs and its actions in short term and long-term complications of IUGR.
- The treatment principle includes *Deepana, Pachana*, *Srothosodhana*, *Hridyam, Brumhana* and *Vatagna karma*, which reduced the placental resistance, increase foetal circulation, improves transportation of nutrients through placental barrier.
- Further research can be conducted in more study populations to establish the efficacy of the drugs and animal studies give more insight in molecular level action.

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