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Ayurveda Management of IUGR due to single umbilical artery: A case report

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ABSTRACT

IUGR is defined as a rate of fetal growth that is less than normal for the expected growth potential of a specific infant. Fetuses with isolated single umbilical artery are at higher risk of prematurity, IUGR(Intra uterine growth restriction), and intrauterine death. Ayurveda provides a holistic approach towards *garbhini paricharya* (antenatal care). *Nabhinadi* (umbilical cord) nourishes the fetus, and abnormalities result in *garbhashosha*. This is a case report of IUGR associated with a single umbilical artery with no other abnormalities. The obstetric scan revealed decreased abdominal circumference and falling growth parameters. Ayurvedic medicines with *brimhana, balya, prajasthapana* actions were given. The outcome was a full-term baby of birth weight 2.5kg through vaginal delivery.

1. Introduction

Single umbilical artery is the most common macroscopic anomaly and most common malformation of the umbilical cord [1]. The prevalence of Single umbilical artery (SUA) is 0.5–6% worldwide [2]. SUA may be due to primary agenesis or secondary atrophy of one of the umbilical arteries [3]. It is defined as the absence of one umbilical artery in the umbilical cord. Often it is associated with congenital anomalies. When there is no chromosomal or structural anomaly, it is isolated single umbilical artery [4]. This is a risk factor for adverse pregnancy outcomes [5]. SUA increases risks of prematurity, Intra uterine death, Intra uterine growth restriction (IUGR) [6] and mortality among neonates [7]. IUGR is defined as a rate of fetal growth that is less than normal for the expected growth potential of a specific infant [8]. IUGR may result from Maternal, Placental or Fetal origin. These infants may have acute neonatal problems like hypothermia, hypogycemia and perinatal asphyxia. It is one of the leading causes of perinatal-neonatal morbidity and mortality and contributes to long-term chronic diseases. Individuals born after IUGR are more susceptible to metabolic syndrome, cardiovascular and renal diseases, Type 2 Diabetes and chronic lung diseases at adulthood [9]. Asymmetrical IUGR occur later in third trimester and is mainly caused by utero placental insufficiency. In the Ayurvedic concept fetal nourishment changes in a phasic manner. During Post fertilisation and post implantation period it occur mainly through *upasneha* and *upasweda* [10]. *Nabhinadi* (umbilcal cord) transfers the essence of *ahararasa* from mother to fetus, nourishing the fetus [11]. We report a case of 33-year-old multigravidae, whose second-trimester ultrasound of 26 weeks showed a single umbilical artery and decreased fetal abdominal circumference. Thirty-four weeks obstetric scan revealed fetal weight to be 1991 ± 199.1 gms.

2. Patient information

A 33-year-old pregnant woman, multi gravida (G2A1) with gestational age of 32 weeks and two days came to the OPD of the Government Ayurveda College Hospital for Women and Children, Trivandrum. She was undergoing regular antenatal check-ups in a private allopathic hospital. Her Obstetric-2/3 Trimester scan revealed a single live intra uterine gestation with a single umbilical artery. Fetal Abdominal Circumference(AC) showed a downward trend and fell to the 13 centiles for the gestational age. They suggested a probability of growth restriction in the fetus and advised a protein diet. She preferred Ayurvedic treatment. On history taking, Her LMP was 24/06/2021. She had regular menstrual cycles with 30 days interval and 5 days of moderate

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Table 1
Investigations

Date and investigation	Value
2022-01-11	
Hb (hemoglobin)	10.4%
2022-02-05	
BP (blood píessuíe)	106/72mm Hg
Weight	57kg
2022-02-24	
BP (blood píessuíe)	120/80mm Hg
Weight	62kg
2022-03-21	
Hb (hemoglobin)	12.3%

bleeding. She had a spontaneous abortion at 4.5 weeks of gestation in 2014. Family history showed the father was diabetic and hypertensive, and the mother had diabetes.

3. Clinical findings

Abdominal examination showed no significant disparity in fundal height and gestational age. Other investigations are mentioned in Table 1.

4. Diagnosis

Second trimester obstetric ultra sound on 28/12/2021 revealed single intra uterine gestation of 26 weeks 5 days, Placenta -posterior and single umbilical artery in umbilical cord. Fetal AC shows a downward trend and falls at the 13 centiles for the gestational age. Fetal activities and cardiac activities were good.

0bstetric- 2/3 Trimester scan on 16/02/2022 revealed Single Live intra uterine fetus of 33weeks 6 days. Estimated Fetal Weight according to BPD, HC,AC,FL- 1991 $\pm$ 199.1 gms. All biometric parameters were falling along the lower centiles and the fetal weight was falling at the 22 centile for the gestational age.

5. Therapeutic intervention

The following medicines were given on 5/02/2022:

1 *Dadimadi Ghritam*- 10 ml, Twice daily morning and evening before food with milk
2 *Dhanwantaram gulika*,-2 tablet, twice daily morning and evening after food with water
3 *Balaksheera kasayam*- 90ml twice daily, morning and evening after food
4 Xerfer cap- 1capsule twice daily, after food

On 24/02/2022, she came for next visit. Then *Ghrita* was changed to *Vidaryadi ghritam*, 10ml twice daily before food with milk. She was advised to continue rest of the medicines.

6. Outcome

She delivered a healthy full term female baby of weight 2.5kg with APGAR 9 at 1 minute on 21/3/2022. Mode of delivery was vaginal delivery with Right mediolateral episiotomy. Hb count of mother during delivery was 12.3 gm%.

7. Discussion

Ayurveda has great concept of *masanumasika garbhini paricharya*, where monthly diet and regimens of *garbhini* (pregnant women)is explained to avoid difficulties of pregnancy and labour. *Nabhinadi* or umbilical cord is mainly responsible for nourishment of fetus. Thus defects in *nabhinadi* leads to abnormalities in fetal growth. In this case of single umbilical artery fetal nourishment is compromised. Medicines given improves growth and development of fetus,improves maternal health and facilitates normal labour. Her Hb level was 10.4 gm% on the first visit. Considering symptoms like fatigue, palpitation and low Hb level *Dadimadi ghrita* [12] was given. *Dadimadi ghrita* contains Dadima (*Punica granatum*) Dhanyaka (*Coriandrum sativum*), Chitraka (*Plumbago zeylanica*), Shunti (*Zingiber officinale*), Pippali *(Piper nigrum*) and *Ghrita* as its ingredients. The formulation is *raktha vardhana*(increases blood), *balavardhaka* (increases strength)and *hridya*. Many studies prove the effect of *Dadimadi ghrita* in *pandu* (anemia). It is indicated in *dukhaprasava*,(difficult labor) The formulation is based on ghee, which itself have properties like *brumhana, pushtikara* and is auspicious [13]. *Dhanwantaram gulika* is indicated for *kasa*(cough), *swasa*(dyspnoea), has actions on respiratory system [14]. It accelarates lung maturity in fetus as prematurity is one of the main complication of SUA. V*ata* - is responsible for proper movement of *ahararasa* from mother to fetus and also for proper growth and development of fetus [15]. *Dhanwantaram gulika* has properties of *vata anulomana* which facilitates proper functioning of vata. *Balaksheera kashaya* is prepared from *Bala* and milk by *ksheerapakavidhi* [16].15g of fine powder of *Bala* was boiled in 200 ml milk, 400ml water, boiled and reduced to 200ml,filtered and given in two divided dose in morning and evening. The formulation as a whole gives strength and nourishment to fetus and mother. *Bala* is *brimhana, balya, prajasthapana, raktaprasadana* [17]. The *Ghrita* formulation was changed to *Vidaryadi ghritam* keeping in view the impending Low birth weight and respiratory distress that may arise as a result of prematurity [18]. The ingredients are Vidari *(Ipomea paniculata*), Panchangula (*Ricinus communis*), Vrischikali (*Helitropium indicum*), Punarnava (*Boerhaavia diffusa*), Devahvaya (*Cedrus deodara*), Mudgaparni (*Vigna pilosa*), Mashaparni (*Vigna radiata*), Kandukari (*Mucuna pruriens*), Abhiru (*Asparagus racemosus*), Vira (*Coccinia grandis*), Jivanti (holostemma ada kodien), Jivaka (*Microstylis wallichi*), Risabhaka (*Microstylis muscifera*), Brihati (*Solanum indicum*), Kandakari (*Solanum xanthocarpum*), Goksura (*Tribulus terrestris*), Prishniparni (*Desmodium gangeticum*), Salaparni (*Pseudarthria viscida*), Gopasuta (*Hemidesmus indicus*), Tripadi (*Desmodium triflorum*), Ksheera (Cow milk), Ghritha (Ghee). The drugs are mainly *Madhura rasa* and *Madhura* in *vipaka*. The formulation is *vatapitha hara, brumhana* (nourishing) and *hridya*. It is indicated in *Sosha* and is considered to have effect in *Urdhwa swasa* and *Kasa* which means it has effects on the repiratory system.

8. Patient perspective

"I was very much tensed about the health of my baby. Ultrasound scan showed single umbilical artery. I was worried about the weight of the baby. I was aware of the chance of preterm labor and low birth weight since I am a nurse. My Hb levels were low, and I was feeling down. On taking Ayurvedic medicines, I felt better and more energetic. I had a vaginal delivery. My baby was healthy and had 2.5kg at the time of birth. My Hb level also improved."

9. Conclusion

In this case, there was decreased growth in the fetus due to SUA, leading to improper nourishment. Here we could anticipate a chance of prematurity and low birth weight. Timely intervention with Ayurvedic medicines helped to achieve a term female baby with a birth weight of 2.5kg. This case shows how Ayurvedic interventions can contribute to correcting IUGR and ensuring healthy pregnancy and delivery.

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Author contributions

Author 1 - conceptualisation, methodology, software, validation, Formal analysis, Investigations, resources, Data curation, Writing-review and editing, visualization, supervision, Project administration.

Author 2-conceptualisation, methodology, software, validation, Formal analysis, investigations, resources, Data curation, Writing-review and editing, visualization, supervision.

Author 3- conceptualisation, methodology, software, validation, Formal analysis, investigations, resources, Data curation, Writing-original draft.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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