

Integrative Management of Monochorionic Diamniotic Twins with Abnormal Doppler Findings Using Ayurveda Interventions: A Case Report

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Abstract: ***Background:** Monochorionic diamniotic (MCDA) twin pregnancies are associated with increased risks of placental insufficiency, fetal growth restriction, preterm birth, and perinatal morbidity. Ayurveda describes twin gestation as Yamala Garbha and emphasizes maternal nutrition, Agni, Rasa Dhatu Poshana, and Garbhasthapana for healthy fetal development. **Case Presentation:** A 23-year-old primigravida with an MCDA twin pregnancy presented at 13–14 weeks of gestation. Serial ultrasonography and Doppler studies revealed placental insufficiency with intermittent absent end-diastolic flow in the umbilical artery of one twin and fetal growth discordance. She received standard obstetric care, and serial fetal surveillance, along with individualized Ayurvedic management comprising Laghumalini and Madhumalini Vasant, Pravala Bhasma, Makshika preparations, Sariva Churna, Dhamasa, Masaanumasika formulations, dietary modifications, and nutritional support. **Results:** Maternal nutritional status and weight improved during pregnancy. Serial Doppler studies showed stabilization and subsequent normalization of umbilical artery flow. Pregnancy was successfully prolonged until 35–36 weeks, when elective cesarean section delivered two live male neonates weighing 1.90 kg and 1.64 kg. Both had good neonatal outcomes; the smaller twin required brief NICU care. **Conclusion:** Integrative Ayurvedic supportive therapy alongside conventional obstetric management was associated with favorable maternal and neonatal outcomes in this high-risk MCDA twin pregnancy complicated by placental insufficiency.*

Keywords: Monochorionic diamniotic twins, placental insufficiency, Ayurveda, Yamala Garbha, integrative obstetrics, case report

1. Introduction

Twin pregnancy is a high-risk obstetric condition associated with significantly increased maternal, fetal, and neonatal morbidity compared with singleton gestation. The incidence of twin pregnancies has increased worldwide owing to delayed childbearing and the widespread use of assisted reproductive technologies. Among twin pregnancies, **monochorionic diamniotic (MCDA)** twins account for approximately 70% of monochorionic gestations and result from division of a single fertilized ovum between the fourth and eighth day after fertilization. Although each fetus occupies a separate amniotic sac, both share a common placenta containing vascular anastomoses, predisposing them to unique complications such as twin-to-twin transfusion syndrome (TTTS), selective fetal growth restriction (sFGR), twin anemia-polycythemia sequence (TAPS), abnormal umbilical artery Doppler findings, fetal growth discordance, and increased perinatal mortality.¹

Placental insufficiency resulting from unequal placental sharing and impaired uteroplacental perfusion is a major determinant of adverse outcomes in MCDA pregnancies.² Doppler velocimetry of the umbilical artery, middle cerebral artery, and ductus venosus has become an indispensable tool for fetal surveillance and guides the timing of intervention and delivery. Current obstetric management focuses on serial ultrasonographic monitoring, optimization of maternal health, fetal surveillance, and timely delivery to improve neonatal outcomes.³

Ayurveda considers pregnancy (*Garbhini Avastha*) to be a physiologically delicate period requiring comprehensive antenatal care aimed at maintaining maternal health and ensuring normal fetal growth. Classical Ayurvedic texts emphasize **Garbhini Paricharya**,⁴ a systematic month-wise antenatal regimen incorporating appropriate diet (*Ahara*), lifestyle (*Vihara*), and medications (*Aushadha*) to support fetal development and prevent pregnancy-related complications. Adequate nourishment of the fetus is believed to occur through **Rasa Dhatu**, while balanced **Agni** (digestive and metabolic function), unobstructed **Srotas**, and preservation of **Ojas** are considered essential for healthy gestation.

Twin pregnancy is described in Ayurveda under the concept of **Yamala Garbha**, wherein two fetuses develop simultaneously within the uterus due to division of the **Beeja** or the influence of multiple **Beeja Bhagas**. Although the classical texts do not describe chorionicity in modern anatomical terms, the principles of fetal nourishment through maternal **Rasa Dhatu** and maintenance of **Garbha Sthirata** provide a conceptual framework for supportive management during multiple gestation. Ayurvedic interventions aimed at improving maternal nutrition, enhancing tissue metabolism, promoting **Rasa-Rakta Dhatu Poshana**, and supporting fetal well-being may complement conventional obstetric care in selected high-risk pregnancies.

The present case describes the integrative management of a monochorionic diamniotic twin pregnancy complicated by placental insufficiency and abnormal umbilical artery Doppler findings. Along with evidence-based obstetric management, individualized Ayurvedic medicines, dietary

modifications, and month-wise antenatal care were administered to optimize maternal nutrition and support fetal growth. The favorable maternal and neonatal outcomes observed in this case highlight the potential role of integrative management in carefully monitored high-risk twin pregnancies and underscore the need for further clinical research to evaluate the safety and effectiveness of such approaches.

2. Case Report

A 23- year Primipara, GA 13-14 weeks came with complaints of nausea and vomiting on & off sine 2 weeks and anorexia. She had twin pregnancy and wished to register in our hospital.

History noted as follows:

Menstrual History:

Menarche: At 11 years

Menstrual pattern: 4-5/28 days regular, 2-3 pads per day, no clots or any other abnormality noted, minimal pain

LMP- 16/11/2023

EDD- 23/8/2024

- Marital status: married 5 months a Contraception: Not used
- **Obstetric History:** G1P1L0A0 -G1 –present gestation- twins
- No H/o major illness
- No surgical hiatory noted
- No known drug or food allergy
- Family History- Mother –K/C/O – DM on Treatment

3. Clinical Findings

O/E – medium built,conscious, well oriented. P-80/min BP- 110/70 mmof Hg,p/a –Fundal ht-20 wks fetal movements felt.

Wt- 46 kg, ht.-138cm, BMI-21.

No evidence of icterus/pallor/odema/lymphadenopathy noted.

Examination as per Ayurveda

- Ashtavidha pariksha -Nadi- Pitta kapha mutra-5-6 /24 hrs adequate, mala –once or twice aday, soft sometimes malavshambha,jivha- samata (lipta)shabda-samyak,sparsha- Anushna Sheeta, Druk –prakrit, shabda-prakrit, Akriti- madhyam.
- Dashavidha pariksha
Prakriti- pitta vata ,Vikriti- alpa, sara madhyama, Samhanana madhyam, satmya-madhyam, satva-madhyam, vyayam shakti-alpa, Vaya- yuva .

Investigations

I) Haematology

Haemogram –Hb-10.8gm/dl

W.B.C – 9170/cumm

Platelet -1.71 l/cumm

BSL – F -87.2,PP- 90.4 mg/dl

Blood group – ‘O’ positive

T3,T4,TSH – WNL

Hbsag – Non reactive

VDRL- Non reactive

II) USG – Monochorionic diamniotic twins (MCDA)

Date	GA	Fetus A	Fetus B	Liquor
12/3/24	16 wks 5 days	17 wks Doppler – UA normal flow	17 wks UA –absent diastolic flow	adequate
19/3/24	17 wks 2days	UA-high resistance flow	UA –absent diastolic flow	adequate
27/3/24	18 wks 6 days	BPD-18 wks 6d UA-normal flow	BPD-18 wks 2 d UA- intermittent absent diastolic flow with forward flow	adequate
10/6/24	29 WKS 4 Days	WT 1065 gms,cephalic UA- normal flow	Wt-831 transverse lie, UA- normal flow	Adequate
2/7/24	32 wks 5 days	GA 30 wks Doppler –normal Wt-1496	GA 28 wks Doppler–normal Wt-1122	Adequate
13/7/24	34 wks	32 wks,increased diastolic flow	30 wks = F2- increasedes diastolic flow	adequate
15/7/24	34 wks 4 days	32 wks, Doppler normal, increased diatolic flow in MCA wt – 1835 gms	32 wks 4 days, Doppler normal in umbilical artery, MCA, DV – normal flow	Liquor slightly reduced

Therapeutic Intervention

The patient was examined clinically her detailed dietary history, vihaara, psychological status was assessed. High risk consent and implied consent for therapeutic intervention was

obtained. After baseline investigations and specialised Doppler study placental insufficiency was noted. Along with conventional treatment like anti platelet agents Ayurveda drugs and dietary changes were included.

Table 2: Timeline of intervention

Date	GA, F/u	Clinical findings	Oral medication	Anupana	diet
04/03/24	15.4 wks Wt-	P/A-ut -18-20 wks F1-155/min F2- 150/min	Laghumalini vasanta +praval bhasma+ makshik bhasma+ Sarivachurna 500mg BD -15 days	Shunthi siddha laja manda	Mudga yusha Rice, laja
28/3/24	18.2 wks Wt-49 kg	P/A-ut -24-26 wks F1-158/min F2- 148 /min	Suvarna malini vasanta +praval bhasma + vanga makshik + Sarivachurna 500mg BD -8 days	Shatavari kalpa+ panchama masa kashaya	Mansa rasa + rice
8/4/24	20.4 wks	P/A-ut -26 wks	Suvarna malini vasanta +praval bhasma + vanga	Shatavari kalpa	Mudga yusha kurta +

	Wt-	F1-158/min F2- 148 /min	makshik + Sarivachurna 500mg BD -8 days		Rice, laja
27/4/26	23.2 wks Wt-52	P/A-ut -28 wks F1-148/min F2- 144 /min	Laghmalini vasanta +praval bhasma + makshik bhasma+ Sarivachurna 500mg BD -15 D	Water	Navaneeta,laja manda/kurta mudga yusha
22/05/24	27.2 wks Wt-52.7	P/A- ut- 28-30 wks	Laghmalini vasanta +praval bhasma + makshik bhasma+ Sarivachurna 500mg BD -15 D	Dadima avaleha saptama masa kashyaya	Ksheera,navaneeta ,rice,krushara
13/6/24	30 wks Wt-54.5 kg	P/A- ut34 wks F1,F2 - N	Laghmalini vasanta +praval bhasma + makshik bhasma+ dhamasa+ Sarivachurna 500mg BD -15 D	Dadima avaleha	Full diet ,shringataka kheera pak
1/7/24	36 wks Wt-54.5 kg	P/A- ut34 wks F1,F2 - N	Madhumalini vasanta +praval bhasma + makshik bhasma+ dhamasa+ Sarivachurna 500mg	Shringataka ksheerapak	Full diet ,milk

Outcome:

Her EDD was 22/8/24 by LMP and ist USG report .IT was planned to terminate pregnancy at 36 wks of Gestational age. She was followed regularly and her Doppler witj USG reports were monitored and interventions were modified accordingly. Elective LSCS was done on 19th July 2024 .whole procedure was uneventful and delivered twin male babies of weight F1-1.9 kg and F2 –1.64 kg .Both babies cried immediately after birth .no meconium or signs of distress noted.Fetus B was kept in NICU on minimal O2 but was discharged on D8 .Both babies discharged after 13 days.

4. Discussion

I) Conceptual Discussion:

Monochorionic diamniotic (MCDA) twin pregnancy is one of the highest-risk forms of twin gestation because both fetuses share a single placenta while occupying separate amniotic sacs.⁴ Monochorionic placentation is associated with unequal placental sharing and vascular anastomoses, predisposing to complications such as selective fetal growth restriction (sFGR), twin-to-twin transfusion syndrome (TTTS), twin anemia-polycythemia sequence (TAPS), fetal growth discordance, abnormal umbilical artery Doppler findings, and increased perinatal morbidity and mortality. Therefore, these pregnancies require intensive fetal surveillance with serial ultrasonography and Doppler studies.⁵

In the present case, the patient presented during early second trimester with persistent nausea, vomiting, anorexia, and was diagnosed with a monochorionic diamniotic twin pregnancy. Serial Doppler studies demonstrated evidence of placental insufficiency affecting the second twin, including absent and intermittent absent end-diastolic flow in the umbilical artery, suggesting increased placental vascular resistance. Such Doppler abnormalities are recognized predictors of fetal compromise and warrant close monitoring and timely intervention.

Despite these adverse Doppler findings, serial surveillance showed gradual normalization of umbilical artery flow in later gestation, with adequate liquor maintained until the late third trimester. Although fetal growth discordance persisted, both fetuses demonstrated satisfactory interval growth. Elective lower segment cesarean section at 35–36 weeks resulted in the delivery of two live male infants weighing 1.9 kg and 1.64 kg respectively, with good neonatal outcomes. Only the smaller twin required brief NICU observation and oxygen support, reflecting successful prolongation of pregnancy despite placental insufficiency.

From an Ayurvedic perspective, twin pregnancy is described under the concept of **Yamala Garbha**. Classical texts explain that multiple fetuses develop when the **Beeja (zygote)** undergoes division or when the reproductive elements possess the capacity to produce more than one embryo. Sushruta describes *Yamala Garbha* as the simultaneous development of two fetuses within the uterus due to division of the fertilized ovum or the influence of multiple *Beeja Bhaga*.⁶ Although ancient Ayurvedic scholars did not describe placentation in modern anatomical terms, the concept of shared nourishment (*Garbha Poshana*) through maternal **Rasa Dhatu** closely resembles the dependence of both fetuses on a common placental circulation.⁷

According to Ayurveda, fetal development depends upon the harmonious interaction of **Ritu, Kshetra, Ambu and Beeja**⁸, with continuous nourishment through maternal *Rasa Dhatu*. In twin pregnancy, the nutritional demand is considerably increased because maternal nourishment has to support two developing fetuses simultaneously. Any inadequacy in maternal nutrition or impairment in placental function can result in **Garbha Kshaya, Garbha Upaghata**, intrauterine growth restriction, (*Upavishtaka*)⁹ or premature delivery. Therefore, maintenance of optimal maternal nutrition (*Poshana*), enhancement of placental perfusion, and preservation of fetal vitality become important therapeutic objectives.

The patient exhibited **Pitta-Vata Prakriti** with symptoms of nausea, vomiting, anorexia, occasional constipation, and mild anemia. These features indicate disturbance of **Rasa Dhatu**, impaired digestive function (*Agnimandya*), and relative depletion of maternal nutritional reserves. The therapeutic approach was therefore directed toward improving digestion (Agni), enhancing maternal nutrition, supporting placental function, and promoting fetal growth while continuing evidence-based obstetric management.

Routine ANC care with Iron and calcium was administered to patient.Ayurvedic management was individualized according to gestational age and consisted of formulations including *Laghmalini Vasant, Suvarna Malini Vasant, Madhumalini Vasant, Pravala Bhasma, Makshika Bhasma, Vanga Makshika, Sariva Churna, and Dhamasa, administered with appropriate Anupana such as* Shunthi Siddha Laja Manda, Shatavari Kalpa, Dadimavaleha, and Shringataka Ksheerapaka.

Dietary recommendations included *Mudga Yusha*, *Mamsa Rasa*, *Ksheera*, *Navaneeta*, *Krushara*, rice preparations, and *Laja Manda*, which are traditionally regarded as easily digestible, nourishing, and supportive of maternal and fetal tissue development.

The rationale behind these interventions is consistent with Ayurvedic principles. **Shatavari** acts as a *Rasayana*, *Balya*, and *Garbhasthapaka*, improving maternal nourishment and supporting fetal growth. **Sariva** possesses *Pitta Shamaka* and *Raktaprasadana* properties. **Pravala Bhasma** provides calcium-rich support and is traditionally indicated in disorders associated with Pitta aggravation. **Makshika preparations** are described as *Rasayana* and hematinic agents that improve *Rasa* and *Rakta Dhatu*. *Shunthi Siddha Laja Manda* alleviates nausea, improves digestion, and restores appetite during pregnancy, whereas *Dadimavaleha* is recognized for enhancing appetite and correcting anemia. The prescribed dietary regimen supplied easily digestible proteins, carbohydrates, and micronutrients necessary for increasing fetal nutritional requirements.

II) Drug Discussion - Action of Vasanta kalpa – ^{10,11}

I) Laghumalini vasanta –

It is a classical Ayurvedic formulation containing **Kharpara**, **Maricha (Piper nigrum)**, and **Navanita (fresh butter)** as its principal ingredients. According to Ayurvedic principles, the formulation primarily acts by improving **Agni (digestive and metabolic functions)** and facilitating proper formation and nourishment of **Rasa Dhatu**, which is the primary nutrient responsible for fetal nourishment during pregnancy.

The **Ushna** and **Tikshna Guna** of *Maricha* are believed to alleviate **Kapha predominance**, reduce **Srotorodha (obstruction of microchannels)**, and promote efficient digestion, absorption, and tissue metabolism. Improved **Agni** supports optimal nutrient assimilation, thereby enhancing maternal nutritional status and ensuring adequate supply of nutrients to the developing fetus through healthy **Rasa Dhatu**.

Kharpara contributes to tissue nourishment and is traditionally regarded as supportive of maternal strength and fetal development. The inclusion of **Navanita**, possessing **Snigdha** and **Brimhana** properties, helps counterbalance the penetrating and heating effects of *Maricha*, thereby maintaining physiological equilibrium without producing excessive **Rukshata (dryness)**. This combination makes the formulation suitable for use during pregnancy when preservation of maternal nutrition and tissue unctuousness is essential.

From an Ayurvedic perspective, Laghumalini Vasant is considered to possess **Garbhasthapaka** (fetus-supportive) and **Balya** (strength-promoting) properties. By improving maternal metabolism, maintaining unobstructed nutrient transport, and supporting the stability of **Garbha**, the formulation may contribute to favorable fetal growth and maintenance of pregnancy.

II) Suvarna malini Vasanta –¹²

Suvarna Malini Vasant is a classical Ayurvedic herbo-mineral formulation containing **Rasaka (Kharpara)**, **Hingula**, **Maricha (Piper nigrum)**, **Navanita (fresh butter)**, and **Nimbu Swarasa** as important constituents.

In Ayurveda, this formulation is classified as a **Rasayana**, **Balya**, and **Garbhasthapaka** medicine, traditionally indicated for promoting maternal strength and supporting fetal development.

5. Results and Conclusion

The integrated management combined standard obstetric care, including antiplatelet therapy and serial Doppler surveillance, with Ayurvedic pharmacological and dietary interventions. Although improvement cannot be attributed exclusively to the Ayurvedic medications because conventional management was simultaneously administered, the favorable maternal weight gain (46 kg to 54.5 kg), improvement in nutritional status, maintenance of pregnancy until planned delivery, stabilization of Doppler parameters, and satisfactory neonatal outcome suggest that the integrative approach may have contributed to optimizing maternal health and supporting fetal growth.

This case also highlights the importance of individualized antenatal care in high-risk pregnancies. Continuous fetal surveillance enabled timely modification of therapy according to Doppler findings and fetal growth. Simultaneously, Ayurvediya dietary and supportive interventions addressed maternal nutritional deficiencies and digestive disturbances, which are frequently encountered in twin gestation. Such integrative management may offer complementary benefits in carefully selected patients, provided that it is undertaken under strict obstetric supervision.

Overall, this case demonstrates that early diagnosis, meticulous fetal monitoring, multidisciplinary management, and individualized Ayurvedic nutritional support may facilitate successful continuation of a high-risk monochorionic diamniotic twin pregnancy, resulting in favorable maternal and neonatal outcomes.

Consent of Patient: Consent was obtained from patient for publication of this work

6. Limitation of the Study

Nevertheless, this is a single case report and no causal relationship between the Ayurvedic interventions and clinical outcome can be established. Larger prospective observational studies and randomized controlled clinical trials are required to evaluate the safety, efficacy, and mechanisms of Ayurvedic supportive therapy in monochorionic twin pregnancies complicated by placental insufficiency and fetal growth restriction.

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