



Case Study

UNDERSTANDING ECTOPIC KIDNEY IN FETUS THROUGH THE LENS OF AYURVEDA: CORRELATION WITH MATERNAL ANEMIA DURING PREGNANCY

Pratiksha Godbole^{1*}, Reetu Pandey², Meenakshi Singh³

*1PG Scholar, ²Associate Professor, ³Assistant Professor, PG Department of Prasuti Tantra Evum Stree Roga, R.D. Memorial PG Ayurveda College, Bhopal, Madhya Pradesh, India.

Article info

Article History:

Received: 14-07-2026

Accepted: 12-08-2026

Published: 10-09-2026

KEYWORDS:

Ectopic kidney, Maternal anaemia, *Pandu*, *Garbhaja Vikara*, Ayurveda, Congenital renal anomaly, Neonate.

ABSTRACT

Ectopic kidney is a congenital renal anomaly resulting from abnormal migration of the kidney during embryogenesis. Maternal anaemia is a prevalent obstetric condition that may adversely affect fetal development through chronic hypoxia and impaired nutrient supply. Ayurveda describes *Matruja Pandu* as a condition that can influence fetal nourishment and contribute to *Garbhaja Vikara* (congenital abnormalities). To present a case of ectopic kidney in a newborn born to an anaemic mother and to explore its possible Ayurvedic correlation. A neonate was diagnosed with ectopic kidney on ultrasonographic examination. Antenatal history revealed maternal anaemia during pregnancy. No significant family history, teratogenic exposure, or chromosomal abnormalities were identified. The clinical findings were analyzed from both modern and Ayurvedic perspectives. From an Ayurvedic viewpoint, *Matruja Pandu* may lead to inadequate *Rasa* and *Rakta Dhatu* nourishment, affecting normal fetal organogenesis. Disturbance of *Vata Dosha*, responsible for fetal growth and organ positioning, may contribute to abnormal renal migration. Although a direct causal association cannot be established from a single case, the coexistence of maternal anaemia and congenital renal anomaly warrants further investigation. This case highlights the potential significance of maternal nutritional status in fetal development and provides an integrative perspective on congenital renal anomalies through Ayurvedic principles. Larger studies are needed to explore the relationship between maternal anaemia and fetal renal developmental abnormalities.

INTRODUCTION

Anaemia is the most common haematological disorder that may occur in pregnancy, the others being rhesus isoimmunisation and blood coagulation disorders. Anaemia in pregnancy remains a major global public health problem. According to the World Health Organization (WHO), anaemia is defined in pregnancy as a haemoglobin concentration of less than 11g/dL. The latest WHO estimates indicate that approximately 35.5% of pregnant women aged 15–49 years worldwide were affected by anaemia in 2023.

Anaemia during pregnancy is associated with increased risks of maternal morbidity and mortality, preterm birth, low birth weight, and adverse neonatal outcomes. Iron deficiency is the most common cause, although deficiencies of folate, vitamin B12, infections, and other nutritional disorders may also contribute. Therefore, prevention, early detection, and appropriate management of anaemia are essential components of antenatal care to improve maternal and fetal health outcomes.

Maternal plasma volume increases by about 40-50%. RBC volume increases by 20%. There is relative fall in the level of haemoglobin and haematocrit during pregnancy. All these values return to normal by 6 weeks postpartum. In addition, there is marked demand of extra iron during pregnancy especially in the second half. Even an adequate diet cannot provide the extra demand of iron. Thus, there always remains a physiological iron deficiency state

Access this article online

Quick Response Code



<https://doi.org/10.47070/ayushdhara.v13i4.2933>

Published by Mahadev Publications (Regd.)
publication licensed under a Creative Commons
Attribution-NonCommercial-ShareAlike 4.0
International (CC BY-NC-SA 4.0)

during pregnancy. As a result, there is not only a fall in haemoglobin concentration and haematocrit value in the second half of pregnancy but there is also associated low serum iron, increased iron binding capacity and increased rate of iron absorption as found in iron deficiency anaemia. Thus, the fall in the haemoglobin concentration during pregnancy is due to combined effect of haemo-dilution and negative iron balance. The anaemia is normocytic and normochromic in type.

"पाण्डुत्वेनोपलक्षितो रोगः पाण्डुरोगः"

"The disease characterized by pallor or yellowish-white discoloration of the body is known as *Pandu Roga*." In Ayurveda, the term *Pandu* refers to an abnormal pale, whitish-yellow, or greenish discoloration of the skin, mucous membranes, nails, and eyes resulting from the vitiation of *Dosas*, predominantly *Pitta*. The defining feature (*Laksana*) of this condition is *Pandutva*- loss of the normal healthy complexion. Therefore, any disease presenting with such pallor is termed *Pandu Roga*. Clinically, it is associated with symptoms such as weakness, fatigue, dizziness, breathlessness, loss of appetite, and reduced vitality, and it is often correlated with anaemia in modern medicine.

दोषाभिघातैर्गभिण्या यो यो भागः प्रपीड्यते ।

सस भागः शिशोस्तस्य गर्भस्थस्य प्रपीड्यते ॥ (सु.शा ३/१७)

Acharya Sushruta states that when a pregnant woman is affected by aggravated *Doshas*, the particular part of her body that is afflicted by these *Doshas* exerts a similar adverse effect on the corresponding part of the fetus while it is in the womb. As a result, the same organ or structure of the developing fetus becomes compressed, weakened, or abnormally developed. This suggests that the physiological and pathological relationship between the mother and the fetus, emphasizing that disturbances in the mother's body especially due to vitiated *Doshas* can directly influence fetal growth and lead to congenital abnormalities. It underlines the importance of maintaining *Doshas* balance in the mother throughout pregnancy to ensure normal and healthy development of the fetus. Ayurveda provides a detailed description

Personal History

Name- XYZ	Bala- Avar (poor)
Prakriti- Vatajpitaj	Age- 28 years
Sleep- Adequate	B.P.- 120/80mmHg
Sex- Female	P.R.- 74/min
Marital Status- Married	Bowel Habit- Regular
Height- 148cm	Occupation- House wife
Appetite- Normal	Weight- 63kg

embryological development under the concept of *Garbha Sharira*, emphasizing the role of *Beeja*, *Beejabhaga*, and *Beejabhagavayava* in the formation of a healthy fetus. Any disturbance in these factors leads to *Beejabhava Dushti*, resulting in various congenital abnormalities collectively termed *Garbha Vikriti*.

AIMS AND OBJECTIVES

- To study a case of ectopic kidney in new born baby in light of Ayurvedic concepts, specifically correlating it with *Matruja Pandu Vikara* mentioned in classical text, and to analyse its relevance in modern embryology and teratology.
- To review the Ayurvedic concept of *Matruja Pandu Vikara* with reference to its etiological factors (*Masanumasika paricharya*)

Case Report

The present case study represents Ayurvedic correlation. The 24 years old female patient visited the OPD of PG Department of Prasuti Tantra Evum Stree Roga on regular ANC check-up at R.D.M.C, Bhopal.

Chief Complaints

- Amenorrhea since 9 months.
- Lower abdomen pain

MATERIALS AND METHODS

Case study in single patient is discussed in this research paper.

History of Present Illness

The patient had above complaints. In this period, she experienced vomiting, nausea and sometime morning sickness. Also, in early stage of anaemia had fatigue, anorexia, dyspnea, lassitude, breathlessness. The sign she came was pallor, oedema, brittle hair, angular stomatitis.

History: A 24-year-old female, G3P2L2A0, came for routine antenatal care (ANC) visits. Her first two visit were uneventful with complain of anaemia. She was irregular in her visit. On her third visit, routine ultrasonography (USG) revealed features of right kidney is ectopic. She was referred for a growth scan USG at a higher centre, which confirmed the findings and showed right kidney is ectopic in location, located in right iliac fossa.

Asthavidha Pariksha

Nadi (pulse)- 78/min	Shabda (speech)- Clear
Mala (stool)- Nirama	Sparsh (touch)- Clear
Mutra (urine)- Samyak	Druk (eyes)- Prakrut
Jivha (tongue)-Saam	Aakriti (built)- Madhyam

DISCUSSION

शोषो हल्लासच्छर्दिश्च शोफो ज्वरस्तथारुचिः।

अतीसारो विवर्णत्वमष्टौ गर्भस्योपद्रवाः ॥ (हा.सं.तू. 51/1)

Harita Samhita describes eight common complications associated with pregnancy, collectively known as *Garbhopadravas*. These include emaciation and weakness (*Sosa*), nausea (*Hallasa*), vomiting (*Chardi*), edema (*Sopha*), fever (*Jvara*), loss of appetite (*Aruchi*), diarrhea (*Atisara*), and pallor or discoloration of the body (*Vivarnatva*). The occurrence of these symptoms indicates disturbances in the physiological balance during pregnancy and requires timely attention and appropriate management to ensure the well-being of both the mother and the fetus.

सोऽल्परक्तो ऽल्पमेदस्को निःसारः.....। (च.सं.चि. 16/6)

Charaka Samhita describes the characteristic features of a patient suffering from *Pandu Roga*. It means that the affected individual has a reduced quantity of blood (*Alpa-rakta*), depletion of body fat or adipose tissue (*Alpa-medaska*), and is devoid of proper tissue essence and vitality (*Nihsara*). Due to the vitiation of *Dosas*, particularly *Pitta*, and impairment of *Rasa* and *Rakta dhatus*, the body loses its nourishment, strength, complexion, and lustre. Consequently, the patient appears pale, weak, emaciated, and fatigued, with diminished physical endurance and reduced vitality. This description closely resembles the clinical manifestations of anaemia and malnutrition in contemporary medicine.

सर्ता रसवहा नाड्याः समन्तान्नाभिभ्रिताः।

गर्भो विवर्धमानश्च संपीडयति ताः स्त्रियाः॥

तद्वच्च.....ताभिश्च पीडयमानाभिर्न सम्यग्वर्तते रसः।

आपण्डुगण्डतादीनि लक्षणानि भवन्त्यतः ॥ (का.सं.खि. 9/46-48)

Kashyapa Samhita explains the pathogenesis of *Pandu* (anemia-like condition) during pregnancy. According to *Acharya Kashyapa*, the *Rasavaha Nadis*-the channels responsible for the transportation and nourishment of *Rasa Dhatu*- are distributed around the *Nabhi* (umbilical region). As the fetus grows progressively within the uterus, it exerts pressure on these channels. Owing to this compression, the normal circulation and distribution of *Rasa* become impaired and fail to function properly.

As a result of the disturbed flow of *Rasa Dhatu*, adequate nourishment does not reach the maternal

tissues, leading to depletion of subsequent *Dhatus*, especially *Rakta Dhatu*.

Consequently, the pregnant woman develops features such as *Panduta* (pallor), particularly noticeable over the cheeks (*Apandu-gaṇḍata*), along with weakness, reduced vitality, and other signs associated with *Pandu Roga*. These verses highlight that the mechanical pressure of the enlarging fetus, combined with increased nutritional demands during pregnancy, contributes to the development of maternal anaemia. This Ayurvedic concept can be correlated with the modern understanding that increased fetal requirements and hemodynamic changes during pregnancy may predispose women to anaemia if nutritional intake is inadequate.

Investigation Heamatology (31/10/25)

Haemoglobin- 8.7 gm/dl.

Ultrasound (USG- Growth scan 15/05/2026)

Single intrauterine live fetus seen in vertex presentation, FHR- 136 Bpm. Placenta- is Anterior in upper and mid-segment away from os. Maturity grade- 3. Amniotic Fluid- in its lower normal limit. AFI- 9.18 cm. Single deepest cord free pocket measures 3.5 cm. Right renal bed is empty. Right kidney is ectopic in location, located in right iliac fossa. Biophysical profile score 10/10. EFW- 2669gm. Fetal growth is appropriate for age.

Haematology - (18/5/26)

Haemoglobin- 7.6 gm/dl

USG of Newborn (05/06/26)

Impression suggests ectopic kidney lying in right illiac fossa.

रक्तमेदः प्रसादाद् वृक्कौ, मांसासृक्कफमेदः प्रसादाद् वृषणौ, शोणितकफप्रसादजं हृदयं, यदाश्रया हि धमन्यः प्राणवहाः, तस्याधो वामतः प्लीहा फुफ्फुसश्च, दक्षिणतो यकृत् क्लोम च; तद्विशेषेण चेतनास्थानम्, अतस्तस्मिंस्तमसाऽऽवृते सर्वप्राणिनः स्वपन्ति ॥ 30॥

CONCLUSION

The Ayurvedic concepts regarding the formation and anatomical location of certain vital organs.

According to *Acharya Sushruta*

- The *Vrikka* (kidneys) originate from the essence (*prasada*) of *Rakta* (blood) and *Meda* (adipose tissue).

- The *Vrusana* (testes) are formed from the essence of *Mamsa* (muscle tissue), *Rakta* (blood), *Kapha*, and *Meda* (fat tissue).
- The *Hrudaya* (Heart) arises from the essence of *Shonita* (blood) and *Kapha*.
- The *Pranavaha Dhamanis* (vessels responsible for carrying life force) are rooted in the heart, making it the principal seat of consciousness (*Chetana sthana*).

It explains the anatomical relationships of these organs. Below the heart, on the left side, are situated the spleen (*Pliha*) and the lungs (*Phupphusa*), while on the right side lie the liver (*Yakrata*) and *Kloma*. Since the heart is regarded as the special seat of consciousness, when it becomes enveloped by (the quality of inertia and darkness), all living beings fall asleep. The commentary elaborates that this passage explains the origin of the kidneys, testes, and heart according to Ayurvedic principles. It notes that the lungs are described as being on the left side because the heart is prominently situated over them. The onset of sleep is attributed to the covering of the heart by *Tamoguna*. The commentary also points out that there is no consensus regarding the exact modern anatomical equivalent of *Kloma*. Various scholars have identified it differently as the gallbladder, trachea, pancreas, pharynx, or large intestine. This diversity of interpretations reflects the complexity of correlating ancient Ayurvedic anatomical concepts with modern anatomy.

Charaka Samhita describes the characteristic features of a patient suffering from *Pandu Roga*. It means that the affected individual has a reduced quantity of blood (*Alpa-rakta*), depletion of body fat or adipose tissue (*Alpa-medaska*), and is devoid of proper tissue essence and vitality (*Nihsara*). Due to the vitiation of *Dosas*, particularly *Pitta*, and impairment of *Rasa* and *Rakta dhatus*, the body loses its nourishment, strength, complexion, and lustre. Consequently, the patient appears pale, weak, emaciated, and fatigued, with diminished physical endurance and reduced vitality. This description closely resembles the clinical manifestations of anaemia and malnutrition in contemporary medicine.

The Ayurvedic descriptions of *Pandu Roga* demonstrate a significant interrelationship between *Rakta Dhātu*, *Meda Dhātu*, and the proper functioning of the kidneys (*Vrukka*). *Acharya Charaka*, in the description of *Pandu Roga*, states that the affected individual is *Alpa-rakta* and *Alpa-medaska*, indicating the depletion of *Rakta* and *Meda Dhatus* as important pathological features of the disease. This depletion results in pallor, weakness, loss of vitality, and impaired nourishment of the body. Complementing

this concept, *Acharya Sushruta* explains that the *Vrukkas* are formed from the *Prasada bhaga* (essence) of *Rakta* and *Meda Dhatus*. Since the structural and functional integrity of the kidneys depends upon the proper quality and quantity of these *Dhatus*, any diminution or vitiation of *Rakta* and *Meda* may adversely affect *Vrukka* function. Thus, the observations of *Charaka* and *Sushruta* establish a conceptual link between *Pandu Roga* and renal health. This correlation suggests that *Pandu* should not be viewed merely as a disorder of reduced blood content but as a systemic condition involving the impairment of multiple *Dhatus*, particularly *Rakta* and *Meda*, which are fundamental to the nourishment and development of the kidneys. Therefore, in the Ayurvedic perspective, the pathogenesis of *Pandu* may have implications for renal structure and function, highlighting the importance of preserving *Dhatu* equilibrium during diagnosis and management.

REFERENCES

1. Barroso, F.; Allard, S.; Kahan, B.C.; Connolly, C.; Smethurst, H.; Choo, L.; Khan, K.; Stanworth, S. Prevalence of maternal anaemia and its predictors: A multi-centre study. *Eur. J. Obstet. Gynecol. Reprod. Biol.* 2011, 159, 99-105.
2. Churchill, D.; Ali, H.; Moussa, M.; Donohue, C.; Pavord, S.; Robinson, S.E.; Cheshire, K.; Wilson, P.; Grant-Casey, J.; Stanworth, S.J. Maternal iron deficiency anaemia in pregnancy: Lessons from a national audit. *Br. J. Haematol.* 2022, 199, 277-284.
3. Cao, C.; O'Brien, K.O. Pregnancy and iron homeostasis: An update. *Nutr. Rev.* 2013, 71, 35-51.
4. Andrews, N.C. Disorders of iron metabolism. *N. Engl. J. Med.* 1999, 341, 1986-1995.
5. Milman, N. Iron in pregnancy: How do we secure an appropriate iron status in the mother and child? *Ann. Nutr. Metab.* 2011, 59, 50-54.
6. Hallberg, L. Iron balance in pregnancy. In *Vitamins and Minerals in Pregnancy and Lactation*; Berger, H., Ed.; Raven Press: New York, NY, USA, 1988; Volume 16, pp. 115-127. [Google Scholar].
7. Widdowson, E.M.; Spray, C.M. Chemical development in utero. *Arch. Dis. Child.* 1951, 26, 205-214.
8. Lynch, S.; Pfeiffer, C.M.; Georgieff, M.K.; Brittenham, G.; Fairweather-Tait, S.; Hurrell, R.F.; McArdle, H.J.; Raiten, D.J. Biomarkers of Nutrition for Development (BOND)-Iron Review. *J. Nutr.* 2018, 148, 1001S-1067S.
9. Bastian, T.W.; von Hohenberg, W.C.; Mickelson, D.J.; Lanier, L.M.; Georgieff, M.K. Iron Deficiency Impairs Developing Hippocampal Neuron Gene Expression, Energy Metabolism, and Dendrite Complexity. *Dev. Neurosci.* 2016, 38, 264-276.
10. Toolan, M.; Barnard, K.; Lynch, M.; Maharjan, N.; Thapa, M.; Rai, N.; Lavender, T.; Larkin, M.; Caldwell,

- D.M.; Burden, C.; et al. A systematic review and narrative synthesis of antenatal interventions to improve maternal and neonatal health in Nepal. *AJOG Glob. Rep.* 2022, 2, 100019.
11. Zhao, G.; Xu, G.; Zhou, M.; Jiang, Y.; Richards, B.; Clark, K.M.; Kaciroti, N.; Georgieff, M.K.; Zhang, Z.; Tardif, T.; et al. Prenatal Iron Supplementation Reduces Maternal Anemia, Iron Deficiency, and Iron Deficiency Anemia in a Randomized Clinical Trial in Rural China, but Iron Deficiency Remains Widespread in Mothers and Neonates. *J. Nutr.* 2015, 145, 1916-1923.
 12. Di Cesare, M.; Shibani, G.; Osendarp, S.; Mozaffarian, D. Global Nutrition Report. Chapter 1: A World Free from Malnutrition: An Assessment of Progress towards the Global Nutrition Targets; Development Initiatives Poverty Research Ltd.: Bristol, UK, 2021; pp. 21-33.
 13. Rahman, M.M.; Abe, S.K.; Rahman, M.S.; Kanda, M.; Narita, S.; Bilano, V.; Ota, E.; Gilmour, S.; Shibuya, K. Maternal anemia and risk of adverse birth and health outcomes in low- and middle-income countries: Systematic review and meta-analysis. *Am. J. Clin. Nutr.* 2016, 103, 495-504.
 14. Quezada-Pinedo, H.G.; Cassel, F.; Duijts, L.; Muckenthaler, M.U.; Gassmann, M.; Jaddoe, V.W.V.; Reiss, I.K.M.; Vermeulen, M.J. Maternal Iron Status in Pregnancy and Child Health Outcomes after Birth: A Systematic Review and Meta-Analysis. *Nutrients* 2021, 13, 2221.
 15. Dewey, K.G.; Oaks, B.M. U-shaped curve for risk associated with maternal hemoglobin, iron status, or iron supplementation. *Am. J. Clin. Nutr.* 2017, 106, 1694S-1702S.
 16. Scanlon, K.S.; Yip, R.; Schieve, L.A.; Cogswell, M.E. High and low hemoglobin levels during pregnancy: Differential risks for preterm birth and small for gestational age. *Obstet. Gynecol.* 2000, 96, 741-748.
 17. Clinical Trial in Rural China, but Iron Deficiency Remains Widespread in Mothers and Neonates. *J. Nutr.* 2015, 145, 1916-1923.
 18. Kriplani A, Mahey R, Dash BB, Kulshreshta V, Agrawal N, Bhatla N. Intravenous iron sucrose therapy for moderate to severe anaemia in pregnancy. *Indian J Med Res* 2013; 138: 78-82.
 19. Jose A, Mahey R, Sharma JB, et al. Comparison of ferric carboxymaltose and iron sucrose complex for treatment of iron deficiency anemia in pregnancy-randomised controlled trial. *BMC Pregnancy Childbirth* 2019; 19(1): 54.
 20. Sanchez-Gonzalez I.R, Castro-Melendez SE, Angeles-Torres AC, Castro-Cortina N, Escobar-Valencia A, Quiroga-Garza A. Efficacy and safety of adjuvant recombinant human erythropoietin and ferrous sulfate as treatment for iron deficiency anemia during the third trimester of pregnancy. *Eur J Obstet Gynecol Reprod Biol* 2016; 205: 32-6.
 21. Royal College of Obstetricians and Gynaecologists. Blood transfusion in obstetrics. RCOG green-top guideline 47. London: Royal College of Obstetricians and Gynaecologists; 2015.
 22. Jahanbin A, Shadkam E, Miri HH, Shirazi AS, Abtahi M. Maternal folic acid supplementation and the risk of oral clefts in offspring. *J Craniofac Surg* 2018; 29(6): e534-41.
 23. Berry RJ, Li Z, Erickson JD, et al. Prevention of neural tube defects with folic acid in China. China-US Collaborative Project for Neural Tube Defect Prevention. *N Engl J Med* 1999; 341: 1864.
 24. Devalia V, Hamilton MS, Molloy AM. Guidelines for the diagnosis and treatment of cobalamin and folate disorders. *Br J Haematol* 2014; 166: 496-513.
 25. Royal College of Obstetricians and Gynaecologists. Management of sickle cell disease in pregnancy. Green top guideline no. 61. London: Royal College of Obstetricians and Gynaecologists; July 2011.

Cite this article as:

Pratiksha Godbole, Reetu Pandey, Meenakshi Singh. Understanding Ectopic Kidney in Fetus Through the Lens of Ayurveda: Correlation with Maternal Anemia During Pregnancy. *AYUSHDHARA*, 2026;13(4):225-229.

<https://doi.org/10.47070/ayushdhara.v13i4.2933>

Source of support: Nil, Conflict of interest: None Declared

***Address for correspondence**

Dr. Pratiksha Godbole

PG Scholar,

PG Department of Prasuti Tantra Evum

Stree Roga, R.D. Memorial P.G.

Ayurveda College, Bhopal,

Madhya Pradesh

Email: Pratikshagodbole11@gmail.com

Disclaimer: AYUSHDHARA is solely owned by Mahadev Publications - A non-profit publications, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. AYUSHDHARA cannot accept any responsibility or liability for the articles content which are published. The views expressed in articles by our contributing authors are not necessarily those of AYUSHDHARA editor or editorial board members.