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# An Integrated Ayurvedic and Modern Obstetric Evaluation of Oligohydramnios with Special Reference to Garbhodaka Kshaya

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**Abstract:** *Background: Amniotic fluid is essential for fetal movement, pulmonary development, cushioning and umbilical-cord protection. Oligohydramnios is an ultrasound finding that may be isolated or reflect membrane rupture, fetal urinary-tract abnormality, placental dysfunction, maternal disease or medication exposure. Ayurveda describes garbhodaka as the fluid associated with the intrauterine environment; the classical description of garbhakshaya includes reduced abdominal enlargement and diminished or absent fetal movement. These concepts offer a historical framework for discussion but are not identical to modern oligohydramnios.*

*Objective: To review the Ayurvedic concept of garbhodaka/garbhakshaya alongside modern amniotic-fluid physiology, ultrasound diagnosis, fetal growth and Doppler assessment, maternal and placental contributors, perinatal outcomes, and evidence-based management; and to outline a research framework for integrated evaluation.*

*Methods: Narrative synthesis of accessible classical-text passages and contemporary professional guidance, including ACOG antenatal-surveillance guidance, SMFM fetal-growth-restriction recommendations and ISUOG ultrasound guidance. This is not a systematic review and no new patient data are analysed.*

*Summary: A deepest vertical pocket (DVP/SDP) below 2 cm is a commonly preferred sonographic criterion for oligohydramnios. AFI of 5 cm or less is also used in many settings, although use of DVP can reduce unnecessary intervention without worsening outcomes. Evaluation must establish gestational age, membrane status, fetal anatomy, growth, placental function and fetal wellbeing. Management depends on gestational age, cause and surveillance findings; delivery is indicated when fetal or maternal risk outweighs prematurity. Hydration may improve fluid measurements in selected patients but is not a treatment for placental insufficiency. No Ayurvedic drug or procedure has adequate evidence to replace standard obstetric monitoring or indicated delivery.*

**Keywords**: Oligohydramnios; garbhodaka; garbhodaka kshaya; Ayurveda; amniotic fluid; fetal growth restriction; Doppler velocimetry; antenatal surveillance.

## I. INTRODUCTION

Oligohydramnios denotes lower-than-expected amniotic-fluid volume for gestational age. It is a clinical sign rather than a single disease. The fluid volume reflects a dynamic balance among fetal urine production, fetal lung-fluid secretion, fetal swallowing, intramembranous absorption and transmembranous exchange. In later pregnancy, fetal urine is a major source of fluid. Reduced fetal renal perfusion, renal/urinary anomalies, membrane rupture or placental insufficiency can therefore reduce fluid volume.

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The Ayurvedic term garbhodaka refers to the fluid surrounding and protecting the fetus. Garbhodaka kshaya may be used in contemporary integrative discussion to describe a perceived reduction in this fluid, but the classical term should not be treated as a validated diagnostic synonym for ultrasound-defined oligohydramnios. Likewise, garbhakshaya in classical descriptions can refer to impaired fetal growth or vitality rather than fluid volume alone. For scientific clarity, the present review uses the modern diagnosis only when supported by ultrasound criteria, and uses Ayurvedic terminology as a parallel conceptual lens.

Clinical importance: Low fluid may be associated with cord compression, variable fetal-heart-rate decelerations, malpresentation, meconium-stained liquor and increased intervention. When it coexists with fetal growth restriction (FGR), hypertension or abnormal Doppler, it may signal uteroplacental disease. The prognosis depends on gestational age, severity, cause, fetal anatomy and the broader clinical picture.

## II. AYURVEDIC CONCEPTS AND CLASSICAL REFERENCES

Ayurvedic embryology discusses the development and nourishment of the garbha through maternal nourishment, rasa, dosha balance and the intrauterine environment.

**मातुस्तु खलु रसवहायां नाड्यां गर्भनाभिनाडीप्रतिबद्धा, साऽस्य मातुराहाररसवीर्यमभिवहति ।**

Garbhodaka is described as a protective fluid associated with the fetus. A Government of India terminology resource records garbhodaka as the fluid in the uterus that protects the fetus, and identifies the term with amniotic fluid in a descriptive/lexical sense [5]. This supports a broad conceptual comparison, not proof that ancient descriptions used current ultrasound thresholds or pathophysiology.

**Classical passage relevant to diminished fetal growth**

A commonly cited Suśruta passage on kṣaya states: " **garbhakṣaye garbhāspandanam anunnata-kukṣitā "**.

A traditional explanatory rendering describes reduced/absent fetal movement and lack of expected abdominal enlargement as signs associated with fetal diminution [6]. The precise textual context and translation should be checked against the edition adopted by the researcher. This verse concerns a broader concept of fetal diminution; it does not directly establish oligohydramnios. Classical texts such as Sushruta Samhita describe conditions like Garbhakshaya and Manda Spandana that resemble features of compromised fetal growth and reduced intrauterine support.

A second relevant distinction is the classical use of garbhodaka in the context of the fluid released during labour. Classical texts also describe month-wise maternal care and nourishment. Such passages may inform historical understanding of pregnancy care, but they should not be converted into modern treatment protocols without pharmacological, toxicological and clinical evidence.

**Integrative interpretation**

| Ayurvedic term / idea | Careful modern comparison | Limit of equivalence |
|---|---|---|
| Garbhodaka | Amniotic fluid and intrauterine fluid environment | Conceptual correspondence; no one-to-one diagnostic definition |
| Garbhodaka kshaya | Possible descriptive analogue for reduced fluid | Requires ultrasound confirmation; not a validated standalone diagnosis |
| Garbhakshaya | Diminished fetal growth/vitality in classical description | Not interchangeable with FGR, fetal demise or oligohydramnios |
| Garbhini paricharya | Antenatal nutrition, rest and supportive care | Must be integrated with antenatal standards and individual risk |

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Ayurvedic principles that can be discussed safely include regular nutritious food, adequate oral fluids when clinically appropriate, avoidance of harmful exposures, maternal rest and individualised supportive care. These are adjunctive wellness principles, not specific therapies proven to restore amniotic fluid. Classical herbs, ghrita preparations, basti, virechana or other procedures should not be prescribed for oligohydramnios in pregnancy on the basis of textual analogy alone. Some botanicals may be uterotonic, hepatotoxic, nephrotoxic, contaminated or interact with prescribed medicines. Any proposed intervention requires a defined formulation, authenticated ingredients, dose, trimester-specific safety data, interaction review and ethics approval.

**Shloka use in a research manuscript**

The verse above may be quoted with its source and a transparent translation, while explicitly stating that it is a historical description and not a diagnostic or therapeutic instruction. Avoid attributing an unverified verse to Charaka or Ashtanga Hridaya. The source used here is the Suśruta Saṃhitā discussion of kṣaya as presented in an accessible text resource [6]; the final submitted manuscript should verify chapter/verse numbering against the institution's standard printed edition.

## III. AMNIOTIC-FLUID PHYSIOLOGY AND AETIOLOGY

Amniotic fluid changes markedly across gestation. In early pregnancy, fluid composition is influenced by maternal plasma and fetal membranes. With maturation of fetal renal function, fetal urine becomes a dominant contributor; fetal lung fluid also enters the cavity. Fluid is continuously swallowed by the fetus and absorbed across fetal membranes into fetal and maternal circulations. The measured volume is therefore a snapshot of a dynamic system, not a direct measurement of fetal urine output.

**Mechanisms leading to low fluid**

| Mechanism | Examples / clinical clues | Assessment |
|---|---|---|
| Reduced fetal urine production | Renal agenesis/dysplasia, obstructive uropathy, severe fetal renal impairment | Detailed fetal anatomy; bladder filling; kidneys; consider specialist assessment |
| Reduced uteroplacental perfusion | Preeclampsia, chronic hypertension, vascular disease, FGR, placental insufficiency | BP, maternal labs as indicated, growth trajectory, UA Doppler |
| Fluid loss | Preterm prelabour rupture of membranes (PPROM), occult membrane rupture | History of watery discharge; sterile speculum assessment and validated tests |
| Medication-related reduction | ACE inhibitors/ARBs; NSAIDs, particularly later pregnancy; other exposures | Medication reconciliation and specialist review; do not stop essential drugs without advice |
| Post-term / idiopathic | Increasing gestational age; no cause identified after assessment | Confirm dates, repeat assessment and surveillance |

Maternal dehydration can be associated with a transient reduction in measured fluid in some pregnancies; oral or intravenous hydration may increase AFI in selected studies. However, a temporary numerical increase does not prove correction of the underlying pathology or improved neonatal outcome. Dehydration should be assessed clinically and corrected appropriately, but persistent oligohydramnios requires evaluation for membrane rupture, placental dysfunction, fetal anomaly and medication effects.

**Maternal factors and history to capture**

Record age, parity, body mass index, nutritional status, oral intake, vomiting/diarrhoea, fever, smoking/tobacco, alcohol or substance exposure, occupation and access to antenatal care. Document chronic hypertension, gestational

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hypertension/preeclampsia, diabetes, renal disease, autoimmune/vascular disease, thrombophilia where relevant, anaemia, infection and prior uterine or cervical procedures. Review all prescription, over-the-counter, herbal and traditional medicines, including dose and timing. Measure blood pressure correctly; assess symptoms such as headache, visual disturbance, epigastric pain, reduced urine output, fever, leaking fluid and reduced fetal movement.

Obstetric history should include previous oligohydramnios, FGR, stillbirth, preterm birth, congenital anomaly, preeclampsia, placental abruption, recurrent pregnancy loss, caesarean delivery and neonatal complications. Current-pregnancy history should include reliable dating, plurality, anomaly-screening results, fetal movement pattern, fundal-height trajectory, bleeding, contractions, suspected rupture of membranes and serial ultrasound reports.

The differential diagnosis is gestation-dependent. Early severe oligohydramnios raises concern for major fetal renal/urinary anomalies or early membrane rupture and carries risks of pulmonary hypoplasia and limb contractures. Late isolated oligohydramnios has a different risk profile and may be idiopathic or associated with placental ageing/dysfunction.

## IV. ULTRASONOGRAPHY, FETAL GROWTH AND FETAL ASSESSMENT

Ultrasound is the principal method for estimating amniotic-fluid volume. A technically adequate examination should document fetal presentation, placental site and appearance, cord insertion where feasible, fetal anatomy (especially kidneys, bladder and urinary tract), biometry, estimated fetal weight (EFW), fluid measurement method and fetal wellbeing. Confirm gestational age from the earliest reliable dating scan; do not repeatedly re-date a pregnancy using late biometry.

**Fluid measurement**

| Method | Common threshold | Practical point |
|---|---|---|
| Single deepest vertical pocket (SDP/DVP) | <2 cm | Preferred by many guidelines for diagnosis; pocket should be free of cord/fetal parts |
| Amniotic fluid index (AFI) | ≤5 cm | Widely used; may label more pregnancies as low-fluid and increase intervention |
| Normal fluid by SDP | ≥2 cm | Interpret with the whole scan and clinical context |

The AIUM/ACR/ACOG/SMFM/SRU practice parameter notes that a deepest vertical pocket below 2 cm is preferred over AFI of 5 cm or less because it can reduce obstetric intervention without a significant difference in perinatal outcome [4]. ACOG defines isolated oligohydramnios for surveillance purposes using a single deepest vertical pocket below 2 cm [1]. Use one method consistently for serial comparison and state the method in the report.

Fetal biometry and growth

Standard measurements are biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and femur length (FL). EFW is calculated using a validated formula (commonly Hadlock) and plotted on an appropriate gestational-age chart. AC is particularly sensitive to reduced hepatic glycogen and soft-tissue deposition in placental insufficiency. A small fetus is not automatically growth restricted: constitutional smallness, dating error and pathological FGR must be differentiated.

SMFM defines FGR as EFW or AC below the 10th percentile for gestational age; severe FGR is commonly considered EFW below the 3rd percentile [2]. ISUOG emphasises that fetal size at one time point is not the same as growth velocity; growth assessment requires serial measurements separated by an appropriate interval [3]. Avoid overly frequent biometry because measurement error can exceed true short-interval growth.

**Fetal wellbeing**

Assess fetal movements and maternal report of change. Non-stress testing/cardiotocography (NST/CTG) evaluates fetal heart-rate reactivity and decelerations. The biophysical profile (BPP) combines NST with fetal breathing, gross body movement, tone and fluid assessment. A modified BPP commonly combines NST and fluid pocket. An abnormal CTG, recurrent decelerations, markedly reduced movements or deteriorating BPP requires prompt obstetric review.

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Abdominal growth, EFW centile, interval growth, fluid volume and Doppler findings should be interpreted together. A fetus with low fluid and low AC/EFW deserves evaluation for placental insufficiency even if maternal symptoms are absent. Conversely, isolated low fluid with normal growth, normal anatomy and reassuring surveillance may follow a different management pathway.

## V. DOPPLER ASSESSMENT AND PLACENTAL FACTORS

Doppler velocimetry provides indirect evidence of resistance and fetal circulatory adaptation. It does not measure placental function directly, and no single index should determine delivery in isolation. Interpretation requires gestational age, waveform quality, fetal condition and local specialist protocols.

| Vessel / index | What it assesses | Clinical interpretation |
|---|---|---|
| Umbilical artery (UA) | Placental vascular resistance; PI/RI/S:D ratio | Raised PI or reduced diastolic flow suggests increased placental resistance; absent (AEDF) or reversed (REDF) end-diastolic flow is high risk |
| Middle cerebral artery (MCA) | Fetal cerebral resistance / redistribution; MCA-PI | Low PI may indicate brain-sparing; MCA peak systolic velocity (PSV) is used in assessment for fetal anaemia |
| Cerebroplacental ratio (CPR) | MCA-PI divided by UA-PI | Low CPR may identify redistribution, especially in late FGR; thresholds and use vary by guideline |
| Uterine artery | Maternal-side uteroplacental impedance | High PI/notching may support risk assessment for placental disease; not a standalone test |
| Ductus venosus (DV) | Fetal venous return and cardiac compromise | Abnormal a-wave in severe early FGR is a specialist finding; used in selected protocols |
| Other fetal vessels | Aortic isthmus, umbilical vein, renal arteries | Selected specialist/research indications; not routine for every low-fluid pregnancy |

For diagnosed FGR, SMFM recommends serial UA Doppler to monitor deterioration: generally every 1–2 weeks, more frequently with severe FGR or decreased diastolic flow, and up to 2–3 times weekly when absent end-diastolic velocity is present. Reversed end-diastolic flow warrants hospital-level assessment, antenatal corticosteroids when preterm delivery is likely, intensified CTG and consideration of delivery [2]. SMFM does not recommend routine use of MCA, DV or uterine-artery Doppler to direct all FGR management; other international protocols may incorporate selected vessels. Local maternal–fetal medicine guidance should govern.

### Placental and cord assessment

Placental contributors include maternal vascular malperfusion, infarction, intervillous thrombosis, chronic abruption, placental insufficiency, abnormal implantation and cord abnormalities. Ultrasound should document placental location, thickness/appearance when abnormal, cord vessel number and insertion if visible. Placental pathology after delivery may clarify maternal vascular malperfusion, infarcts, chronic inflammation, fetal vascular malperfusion or other lesions, but histology is not a prenatal screening test.

Maternal hypertension and preeclampsia can reduce uteroplacental perfusion and fetal renal output. In this setting, low fluid may coexist with FGR, abnormal UA Doppler and maternal end-organ findings. Assess BP, urine protein and laboratory investigations (platelets, creatinine, liver enzymes) according to symptoms and hypertensive-disease protocols. A normal BP at one visit does not exclude evolving placental disease.

A practical integrated report should include: gestational age and dating source; SDP or AFI; BPD/HC/AC/FL and EFW centiles; interval growth; fetal anatomy and bladder/kidneys; placental and cord findings; UA Doppler and any

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additional Doppler with indices/centiles; NST/CTG or BPP; membrane status; maternal BP and relevant medical conditions; and a clear follow-up or delivery recommendation.

## VI. MATERNAL, OBSTETRIC AND INTRAPARTUM OUTCOMES

Potential adverse outcomes associated with oligohydramnios include umbilical-cord compression, variable decelerations, non-reassuring fetal-heart-rate patterns, meconium-stained amniotic fluid, operative vaginal birth or caesarean delivery for fetal-status concerns, and neonatal admission. In prolonged severe early oligohydramnios, pulmonary hypoplasia and positional limb deformities may occur. The magnitude of risk varies substantially by gestational age, duration, aetiology and coexisting FGR or maternal disease.

Maternal and current obstetric variables

Record parity, prior caesarean or uterine surgery, previous adverse pregnancy outcome, gestational age at diagnosis, onset (early/late), singleton or multiple gestation, fetal presentation, cervical status, induction method, labour duration, augmentation, analgesia, intrapartum temperature, membrane-rupture interval and antibiotic exposure where indicated. Record whether the diagnosis was isolated or accompanied by FGR, hypertension, diabetes, renal disease, anomaly or suspected membrane rupture.

**Delivery outcomes to prespecify**

| Domain | Variables / operational definitions |
|---|---|
| Labour | Spontaneous or induced labour; induction indication and method; failed induction; labour duration; augmentation |
| Fetal heart rate | Reassuring/non-reassuring CTG; recurrent variable or late decelerations; tachycardia; bradycardia; fetal distress indication |
| Liquor | Clear, meconium-stained (grade if local protocol uses it), blood-stained or foul-smelling; volume impression |
| Mode of birth | Spontaneous vaginal, operative vaginal, elective/emergency caesarean; indication |
| Neonate | Birth weight; sex; Apgar at 1 and 5 minutes; cord arterial pH/base deficit if obtained; resuscitation; NICU admission; respiratory morbidity; sepsis evaluation; perinatal death |
| Placenta | Weight if routinely measured; gross findings; histopathology where clinically indicated/consented |

"Fetal distress" should not be used as an unqualified endpoint. Prefer predefined, auditable measures such as pathological CTG category, recurrent decelerations, cord-gas acidemia, 5-minute Apgar below a prespecified threshold, neonatal resuscitation or NICU admission. Meconium-stained liquor is an outcome, not proof that oligohydramnios caused fetal hypoxia. Similarly, caesarean delivery is influenced by local practice, parity, induction and clinician threshold.

**Confounding and interpretation**

A crude association between low fluid and adverse outcome may be confounded by gestational age, FGR, hypertensive disease, membrane rupture, congenital anomaly and the indication for delivery. The clinician's awareness of low fluid can itself increase intervention (indication and detection bias). Analyses should distinguish isolated oligohydramnios from oligohydramnios with FGR or maternal disease, and should report both absolute risks and adjusted estimates.

Maternal outcomes may include severe hypertension/preeclampsia, induction, operative delivery, postpartum haemorrhage, infection and length of stay. These should be defined in advance and not combined indiscriminately into

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a single composite endpoint. Neonatal follow-up beyond discharge would strengthen assessment of respiratory and developmental outcomes, especially in early-onset severe cases.

## VII. MANAGEMENT: MODERN OBSTETRICS AND AYURVEDIC SAFETY

Management is individualised according to gestational age, severity, membrane status, fetal anatomy, growth, Doppler, fetal testing and maternal condition. First confirm the measurement and diagnosis; assess for rupture of membranes; review drugs; evaluate kidneys/bladder and fetal growth; assess BP and preeclampsia symptoms; and obtain fetal surveillance appropriate to gestation and risk. Refer to maternal–fetal medicine when early-onset, severe, recurrent, associated with FGR/anomaly, or accompanied by abnormal Doppler or maternal disease.

**Modern obstetric management**

| Clinical situation | Usual management principles (specialist/local protocol applies) |
|---|---|
| Isolated low fluid, reassuring fetus, stable mother | Confirm SDP; evaluate cause; monitor movements and fetal wellbeing; surveillance frequency based on gestation and risk; plan timing of birth rather than treating the number alone |
| Suspected/confirmed PPROM | Sterile speculum and appropriate diagnostic pathway; assess infection, gestational age and fetal status; antibiotics/corticosteroids/magnesium and timing of birth as indicated by PPROM protocol |
| Oligohydramnios with FGR or abnormal UA Doppler | FGR pathway with serial UA Doppler, CTG and maternal assessment; hospitalise for REDF or clinical deterioration; time delivery by gestation and severity |
| Maternal preeclampsia / severe hypertension | Treat and monitor maternal disease; assess end-organ involvement and fetal status; delivery when maternal/fetal indications warrant |
| Dehydration or poor oral intake | Correct clinically significant dehydration and electrolyte disturbance; reassess; do not assume hydration resolves placental or fetal pathology |
| Labour with recurrent decelerations | Continuous intrapartum fetal monitoring when indicated; intrauterine resuscitative measures and expedited birth if persistent compromise |

For isolated oligohydramnios defined by SDP below 2 cm, ACOG states that once- or twice-weekly antenatal fetal surveillance may be considered if the pregnancy is not being delivered [1]. Timing of delivery depends on gestational age and the total clinical picture; many US recommendations consider delivery at 36 0/7–37 6/7 weeks, or at diagnosis if later, for otherwise uncomplicated isolated oligohydramnios. This is not a substitute for local Indian institutional protocols or individual specialist judgement. Do not delay indicated delivery to trial hydration or traditional medicines.

Ayurvedic supportive care: what can and cannot be claimed :-

The Ayurvedic management of Garbhodaka Kshaya can be explained on the basis of the principles of **Vata Shamana, Brimhana, Rasayana, Jeevaniya, Rasa Dhatu Poshana and Garbha Poshana with appropriate garbhini Paricharya**. Although Garbhodaka Kshaya is not described as a separate disease with a specific treatment protocol in the Brihattrayi, its management can be conceptually discussed with reference to Garbha Kshaya, Garbhashosha and Garbhini Paricharya.

Ayurvedic management focuses on correcting the underlying Dosha imbalance, particularly pacifying Vata, and enhancing Dhatu poshana through Brimhana and Rasayana therapies. Milk-based preparations (Ksheerapaka) and medicated ghee formulations (Ghrita) are widely advocated for their nourishing, rejuvenating, and Garbhasthapaka (fetal stabilizing) properties. Drugs like Balamoola (Sida cordifolia) possess Balya and Brimhana effects, while formulations such as Kalyanaka Ghrita are described as Medhya, Tridosha shamaka, and supportive for fetal well-being.

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No classical shloka cited in this review validates a specific herbal medicine for ultrasound-confirmed oligohydramnios. Therefore, this article does not recommend a named Ayurvedic drug, dose, ghrita, basti, virechana or proprietary formulation as treatment. Pregnancy safety data for many herbs are inadequate; product identity, contaminants, heavy metals, uterotonic effects and drug interactions are concerns. If a patient wishes to use an Ayurvedic product, the exact ingredients and dose should be disclosed to the obstetrician and reviewed by a qualified pharmacology/toxicology-informed clinician. Avoid initiating it without documented pregnancy safety and shared decision-making.

**Pathya and Apathya:** The pregnant woman should be advised to consume freshly prepared, nutritious and easily digestible food, maintain adequate fluid intake, take sufficient rest and avoid fasting, skipping meals and excessive physical exertion. Dehydration, inappropriate dietary restrictions and unsupervised medication should be avoided. Maternal nutrition and hydration should be monitored throughout pregnancy.

The clinically defensible integrated model is complementary, not substitutive: Ayurvedic concepts may inform respectful counselling and research hypotheses, while diagnosis, surveillance and delivery decisions remain grounded in validated obstetric assessment.

## VIII. RESEARCH GAP, JUSTIFICATION, STATISTICAL PLAN AND CONCLUSION

### Research gap and justification

The main gap is the absence of a standardised, prospectively validated mapping between Ayurvedic terms such as garbhodaka kshaya/garbhakshaya and modern ultrasound phenotypes. Published clinical work in this area is often limited by small samples, inconsistent oligohydramnios definitions, unclear gestational-age dating, non-standard herbal interventions, inadequate adverse-event reporting and failure to adjust for FGR, hypertension, PPROM or congenital anomaly. There is insufficient high-quality evidence that Ayurvedic medicines increase clinically meaningful outcomes or safely replace standard care.

A justified study should first test the descriptive construct: whether an Ayurvedic assessment framework can be operationalised reproducibly and whether it adds prognostic information beyond SDP, fetal biometry, Doppler and maternal risk factors. Only after safety and feasibility are established should a specific adjunct intervention be studied. Any intervention trial requires ethics approval, trial registration, pharmacognosy and batch standardisation, reproductive toxicology review, informed consent, independent safety monitoring and predefined stopping rules.

### Proposed objectives and methods

Primary objective: To evaluate the association between ultrasound-confirmed oligohydramnios (SDP below 2 cm) and predefined maternal/perinatal outcomes. Secondary objective: To examine whether a prespecified, reproducible Ayurvedic clinical assessment contributes independent predictive information after adjustment for established obstetric variables. Design: Prospective observational cohort at one or more obstetric centres. Enrol consecutive eligible singleton pregnancies; stratify isolated oligohydramnios versus oligohydramnios with FGR, PPROM or maternal disease. Do not withhold standard care.

Inclusion: Pregnant patients with reliable gestational dating and ultrasound-confirmed low fluid according to the protocol. Exclusion/stratification: Multiple gestation, major fetal anomaly, uncertain dates and fetal demise should be excluded from the primary cohort or analysed separately, with reasons documented. Exposure variables: SDP/AFI, EFW and AC centiles, UA-PI and AEDF/REDF, MCA/CPR if used, BP, maternal disease, membrane status, placental findings, medications and any Ayurvedic exposure recorded prospectively.

### Statistical analysis plan

Describe continuous variables as mean ± SD or median (IQR), according to distribution; categorical variables as n (%). Compare groups using t-test/ANOVA or Mann–Whitney/Kruskal–Wallis tests, and chi-square or Fisher's exact test as appropriate. Estimate unadjusted and adjusted associations using multivariable logistic regression for binary outcomes (e.g., NICU admission or non-reassuring intrapartum fetal status) and linear or quantile regression for continuous outcomes (e.g., birth weight), after checking assumptions. Report adjusted odds ratios or beta coefficients with 95% confidence intervals and exact p-values.

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Prespecify confounders based on clinical knowledge: gestational age at diagnosis and delivery, parity, maternal age/BMI, hypertension/preeclampsia, diabetes, PPROM, FGR/EFW centile, fetal anomaly, Doppler category and induction. Avoid univariable p-value screening as the sole basis for covariate selection. Assess collinearity, missingness and model calibration; use multiple imputation when appropriate. Report discrimination (AUC with confidence interval) only if prediction is an objective, and perform internal validation/bootstrapping. Calculate sample size from the expected frequency of the primary outcome and number of model parameters; do not invent a sample size without pilot estimates. A p-value below 0.05 may be used as a conventional threshold, but clinical magnitude and precision take priority.

**Conclusion**

Garbhodaka kshaya is a meaningful subject for integrative scholarly exploration, but it must be handled as a historical/conceptual construct rather than assumed to be identical to oligohydramnios. Modern obstetric evaluation requires objective ultrasound fluid measurement, fetal anatomy and growth assessment, Doppler when indicated, maternal-risk evaluation and appropriate fetal surveillance. Outcomes such as intrapartum decelerations, meconium, operative delivery and neonatal morbidity are multifactorial and must be analysed with confounder adjustment. The strongest justification for an integrated approach is to improve respectful, culturally informed care and generate testable hypotheses—not to replace proven obstetric diagnosis, surveillance or timely delivery with unvalidated medicines.

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