RESEARCH PAPER

"Anatomical Explanation of Various Yogasan Specifically Indicated for Garbhini with Their Effects on the Body"

Dr. Archana Verma[1*], Dr. Kalpana Sharma[2]

[1*]Department of Sharir Rachana, Government Ayurveda College, Kekri, Ajmer, Rajasthan, India
Email: archie.verma26@gmail.com
[2]Dept. Prasuti Tantra Evum Stri Roga, MJF Ayurveda Mahavidyalya, Harota, Chomu City-Jaipur country - India

Abstract
The antenatal period is a transformative physiological state requiring safe, effective, and holistic maternal care. Classical Ayurveda advocates Yogasan (yoga postures) as an integral component of Garbhini Paricharya (antenatal regimen). However, the anatomical rationale underlying these specific postures remains underexplored in modern literature. This review synthesizes classical Ayurvedic texts and contemporary biomechanical, physiological, and obstetric evidence to explain the anatomical basis of Yogasan indicated for Garbhini. We identified twelve principal Yogasan Tadasana, Konasana, Baddha Konasana, Upavistha Konasana, Virabhadrasana I and II, Trikonasana, Marjaryasana, Bitilasana, Malasana, Supta Baddha Konasana, and Viparita Karani each with trimester-specific recommendations. Anatomical analysis reveals mechanisms including pelvic floor myofascial release, sacroiliac joint stabilization, lumbar spine decompression, diaphragmatic excursion enhancement, utero-placental blood flow optimization, and fetal positioning facilitation. These postures modulate key physiological processes: reduce symphysis pubis dysfunction, alleviate lower back pain, improve venous return preventing preeclampsia, promote optimal fetal head engagement, and decrease cortisol levels. When practiced with precautions and under guidance, Yogasan offer a safe, non-pharmacological, cost-effective adjunct for improving maternal and fetal outcomes. Integrating anatomical knowledge with traditional prescription empowers clinicians to personalize prenatal yoga protocols.
Keywords: Garbhini, Yogasan, prenatal yoga, anatomy, pregnancy, Ayurveda, pelvic floor, Garbhini Paricharya, biomechanics, fetal positioning
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1. Introduction

Pregnancy (Garbhavastha) is a unique neuro-endocrino-immunological state characterized by progressive anatomical, physiological, and biomechanical changes. The gravid uterus expands from 50 g to nearly 1000 g at term, the diaphragm elevates by 4 cm, the heart rate increases by 15–20%, cardiac output rises by 40%, and the circulating blood volume expands by 50%. The pelvis undergoes ligamentous relaxation under the influence of relaxin, while the lumbar lordosis increases to counterbalance anterior weight, predisposing to low back pain, diastasis recti, symphysis pubis dysfunction, and venous stasis [1].

Ayurveda, the ancient Indian system of medicine, recognizes pregnancy as a delicate period requiring Ahara (diet), Vihara (lifestyle), and Achara (behavioral) modifications collectively termed Garbhini Paricharya [2]. Within Vihara, Vyayama (physical exercise) is recommended but with specific caution excessive exertion harms the Garbha (fetus), while complete inactivity leads to maternal deconditioning, constipation, and difficult labor. Classical texts including Charaka Samhita, Sushruta Samhita, and Kashyapa Samhita explicitly mention gentle postural practices, stretching, and breathing exercises that closely resemble Yogasan [3].

However, the precise anatomical mechanisms through which these postures benefit the Garbhini (pregnant woman) are not systematically compiled. Modern obstetrics increasingly prescribes prenatal yoga, supported by meta-analyses showing reduced pregnancy-induced hypertension, intrauterine growth restriction, preterm labor, and cesarean rates [4]. Yet, many clinicians remain unaware of the anatomical rationale, limiting confident prescription.

This review aims to: (1) identify Yogasan specifically indicated for Garbhini from classical Ayurvedic and yogic texts; (2) provide detailed anatomical explanations for each posture, including joint positions, muscle actions, ligamentous loading, and effects on pelvic, abdominal, thoracic, and circulatory systems; (3) correlate these with known physiological benefits; and (4) offer trimester-specific guidelines and contraindications. By bridging Ayurvedic wisdom with modern anatomy, this article serves as a resource for obstetricians, physiotherapists, and yoga therapists.

2. Materials and Methods

*Author for Correspondence: archie.verma26@gmail.com

A narrative review was conducted by searching classical Ayurvedic compendia (Charaka Samhita, Sushruta Samhita, Kashyapa Samhita, Ashtanga Hridaya) for references to Vyayama, Yogasan, and Garbhini regimens. Traditional yoga texts (Hatha Yoga Pradipika, Gheranda Samhita) were also consulted for posture descriptions. Electronic databases (PubMed, Google Scholar, Scopus, Cochrane Library, AYUSH Research Portal) were searched from 2000 to 2025 using keywords: "prenatal yoga", "Yogasan", "Garbhini", "pregnancy anatomy", "pelvic floor biomechanics", "yoga for pregnancy", "Ayurveda pregnancy exercise", and "maternal posture physiology". Only English-language articles, systematic reviews, randomized controlled trials, anatomical textbooks, and obstetric guidelines were included. Data extraction focused on: (1) names of Yogasan mentioned as safe in pregnancy; (2) detailed anatomical description of each posture; (3) trimester-specific effects; (4) contraindications; and (5) clinical outcomes. The anatomical mechanisms were cross-validated with Gray's Anatomy [5] and contemporary biomechanical studies.

3. Results

3.1. Yogasan Specifically Indicated for Garbhini

Based on classical and modern sources, twelve Yogasan were identified as safe and beneficial during pregnancy, with trimester-specific modifications (Table 1).

Table 1: Yogasan for Garbhini with Trimester Suitability

Yogasan (Sanskrit)	English Name	First Trimester	Second Trimester	Third Trimester	Primary Anatomical Focus
Tadasana	Mountain pose	Yes	Yes	Yes (wall support)	Spinal alignment, pelvic neutral
Konasana	Angle pose (side stretch)	Yes	Yes	Yes	Lateral trunk, intercostal muscles
Baddha Konasana	Bound angle pose	Yes	Yes	Yes	Hip adductors, pelvic floor
Upavistha Konasana	Seated wide-angle pose	Yes	Yes	Modified (support)	Pelvic outlet, sacroiliac joint
Virabhadrasana I	Warrior I	Yes	Yes	No (avoid after 30 weeks)	Hip flexors, quadriceps, pelvic stability
Virabhadrasana II	Warrior II	Yes	Yes	Modified (shorter stance)	Hip abductors, pelvic diaphragm
Trikonasana	Triangle pose	Yes	Yes	Modified (hand on hip)	Obliques, pelvic lateral tilt
Marjaryasana	Cat pose	Yes	Yes	Yes	Spine flexion-extension, abdominal stretching
Bitilasana	Cow pose	Yes	Yes	Yes	Spine extension, sternal lift
Malasana	Garland pose (squat)	Yes	Yes	Modified (support)	Pelvic floor, sacral mobility
Supta Baddha Konasana	Reclining bound angle	Yes	Yes	Yes (with bolster)	Pelvic relaxation, diaphragm
Viparita Karani	Legs-up-the-wall	Yes	Yes	Yes	Venous return, pelvic congestion relief

3.2. Anatomical Explanation of Each Yogasan

3.2.1. Tadasana (Mountain Pose)

Anatomy: Stands with feet hip-width apart, weight evenly distributed through the tripod of the foot (calcaneus, 1st and 5th metatarsal heads). The anterior superior iliac spines are aligned vertically with the pubic symphysis and the midpoint of the knee and ankle. The Garbhini experiences a progressive anterior shift of the center of gravity (by 2–4 cm) due to the gravid uterus. Tadasana counteracts this by activating the gluteus maximus and medius, quadratus lumborum, and erector spinae to restore a neutral pelvis [6]. The transversus abdominis contracts lightly, providing posterior support to the gravid uterus and reducing lumbar lordosis. **Effect:** Reduces lower back pain, improves proprioception, and prevents falls in late pregnancy.

3.2.2. Konasana (Side Angle Stretch)

Anatomy: From Tadasana, the Garbhini lifts the right arm overhead and leans left, maintaining frontal plane motion without torsion. The primary movers are the contralateral quadratus lumborum (acting as a lateral flexor) and the ipsilateral latissimus dorsi and external oblique. The stretch is felt in the intercostal muscles (especially the external intercostals between ribs 5–9) and the iliocostalis lumborum. During pregnancy, diaphragm elevation from the gravid uterus reduces lung volume by 5–10% [7]. Konasana expands the ipsilateral hemithorax, improving ventilation-perfusion matching. **Effect:** Relieves costovertebral joint stiffness, enhances respiratory reserve, and stretches the round ligament of the uterus which attaches near the iliac crest.

3.2.3. Baddha Konasana (Bound Angle Pose)

Anatomy: Seated with spine erect, soles of feet together, knees dropped laterally. The hip joints are in abduction (≈45–60°), external rotation (≈30°), and slight flexion. This position lengthens the adductor longus, brevis, and magnus, and the gracilis. Crucially, it stretches the pubococcygeus and iliococcygeus portions of the levator ani the main pelvic floor muscles without straining the pubic symphysis [8]. The obturator internus, which forms the lateral pelvic wall, is also stretched. **Effect:** Improves pelvic floor elasticity, reduces perineal tear risk during delivery, relieves symphysis pubis pain by reducing adductor spasm, and enhances sacroiliac joint mobility. In the third trimester, it may facilitate fetal descent into the pelvic brim.

3.2.4. Upavistha Konasana (Seated Wide-Angle Pose)
Anatomy: Seated with legs spread 90–120° apart, spine upright or slightly forward flexed. The hip joints undergo maximal abduction (≈90°) with neutral rotation. The primary stretched muscles are the adductors (especially adductor magnus), the gracilis, and the medial hamstrings (semitendinosus, semimembranosus). The ischial tuberosities widen, increasing the transverse diameter of the pelvic outlet. Additionally, the sacrotuberous and sacrospinous ligaments are gently stretched, allowing the coccyx to move posteriorly during second-stage labor [9]. **Effect:** Prepares the pelvic outlet for fetal expulsion, reduces sciatic nerve entrapment (common in pregnancy due to piriformis syndrome), and alleviates pelvic girdle pain.

3.2.5. Virabhadrasana I (Warrior I)
Anatomy: Standing with right foot forward, left foot back at 45°, front knee flexed to 90°, back leg straight, arms raised overhead. The pelvis must be squared anteriorly. In pregnancy, the increased lumbar lordosis makes pelvic squaring difficult; hence, this pose is recommended only until 30 weeks. The pose strengthens the quadriceps femoris, gluteus maximus, and soleus. Crucially, it stretches the iliopsoas a muscle that attaches from the lumbar vertebrae to the lesser trochanter which becomes shortened in pregnancy due to habitual hip flexion [10]. **Effect:** Reduces hip flexor tightness, improves lumbar stability, and maintains quadriceps strength for squatting positions during labor.

3.2.6. Virabhadrasana II (Warrior II)
Anatomy: Similar stance but arms horizontal, gaze over front hand. The pelvis opens laterally, with the front hip in abduction/external rotation and the back hip in abduction/internal rotation. This pose strengthens the gluteus medius and minimus (hip abductors), which are crucial for pelvic floor support and for preventing a Trendelenburg gait that develops in late pregnancy. The transverse abdominal and internal oblique muscles are engaged to maintain torso neutrality. **Effect:** Improves pelvic side-to-side stability, reduces trochanteric bursitis pain, and maintains hip abductor strength.

3.2.7. Trikonasana (Triangle Pose)
Anatomy: Standing with feet 3–4 feet apart, right foot turned out, left foot slightly in; lateral flexion to the right, right hand reaching shin/floor, left arm vertical. The lateral trunk stretch involves the quadratus lumborum, external oblique, and latissimus dorsi. The abducted arm stretches the pectoralis major and minor, counteracting the forward-rounded shoulder posture typical of late pregnancy. **Effect:** Relieves intercostal neuralgia, improves ribcage compliance, reduces axillary lymph congestion (lymphatic return from breasts is impaired in pregnancy), and alleviates brachialgia from cervical radiculopathy.

3.2.8. Marjaryasana and Bitilasana (Cat-Cow)
Anatomy: All-fours position (hands under shoulders, knees under hips). In Marjaryasana (Cat): spinal flexion posterior pelvic tilt, lumbar kyphosis, thoracic kyphosis, cervical flexion; the erector spinae relax, the rectus abdominis and internal obliques contract. In Bitilasana (Cow): spinal extension anterior pelvic tilt, lumbar lordosis, thoracic extension, cervical extension; the erector spinae contract, the transverse abdominis relaxes. **Effect:** Rhythmic spinal movement mobilizes the zygapophyseal (facet) joints, reduces ligamentous strain, promotes venous return from the epidural venous plexus (preventing supine hypotension syndrome when supine is avoided), and encourages fetal repositioning from breech to cephalic by altering intra-abdominal pressure gradients [11].

3.2.9. Malasana (Garland Pose – Deep Squat)
Anatomy: Deep squat with heels on floor (or elevated if needed), elbows pressing knees apart. This is a position of full hip flexion (≈120°), knee flexion (≈130°), and ankle dorsiflexion (≈20°). The pelvic floor muscles levator ani and coccygeus are maximally stretched and descend inferiorly. The puborectalis portion of the levator ani relaxes, increasing the anorectal angle (normally 90°, becomes 110–120°), which facilitates bowel evacuation and, in labor, allows fetal head passage [12]. The sacroiliac joints rotate posteriorly, increasing the anteroposterior diameter of the pelvic inlet. **Effect:** Prepares the pelvic outlet for second-stage labor; reduces constipation (common in pregnancy due to progesterone-induced gut hypomotility); and strengthens the quadriceps for birthing positions. Contraindicated if placenta previa or risk of preterm labor.

3.2.10. Supta Baddha Konasana (Reclining Bound Angle)
Anatomy: Supine with knees bent, soles together, knees supported by bolsters to avoid abdominal compression. The gravid uterus in supine position after 20 weeks can compress the inferior vena cava (aortocaval compression syndrome) reducing cardiac output by 25–30%. However, the bolsters elevate the torso to 30–45°, avoiding supine hypotension. In this semi-reclined position, the diaphragm descends less, improving functional residual capacity. The pelvic floor is fully relaxed. **Effect:** Provides profound pelvic relaxation, reduces anxiety (parasympathetic activation), lowers blood pressure, and improves utero-placental blood flow when left lateral tilt is incorporated.

3.2.11. Viparita Karani (Legs-Up-the-Wall)
Anatomy: Supine with pelvis on a folded blanket, legs extended vertically against a wall, buttocks touching the wall. This posture creates a hydrostatic pressure gradient favoring venous return from the lower extremities. During pregnancy, venous capacitance increases, and the gravid uterus compresses the iliac veins, leading to dependent edema, varicose veins, and increased risk of deep vein thrombosis (DVT) [13]. Elevating the legs above heart level reverses the pressure gradient, reducing venous pooling. **Effect:** Reduces pedal edema, improves venous return, decreases leg cramps, and may lower blood pressure in hypertensive disorders. Must be avoided in supine hypotension syndrome use left lateral tilt.

3.3. Physiological Effects on Maternal Systems

Table 2 summarizes the systemic effects of regular Yogasan practice during pregnancy based on anatomical mechanisms.

Table 2: Systemic Physiological Effects of Yogasan in Garbhini

System	Anatomical/Physiological Mechanism	Clinical Benefit
Musculoskeletal	Strengthens core stabilizers, stretches shortened hip flexors, mobilizes sacroiliac joints	Reduced lower back pain (70–80% reduction in studies), fewer pelvic girdle symptoms
Cardiovascular	Improves venous return, reduces peripheral resistance, lowers sympathetic tone	Lower risk of gestational hypertension, less pedal edema
Respiratory	Expands chest wall, improves diaphragmatic excursion, increases vital capacity	Reduced dyspnea, improved oxygen delivery to fetus
Endocrine	Reduces cortisol and catecholamines, increases beta-endorphin	Lowered maternal stress, better fetal neurodevelopment
Gastrointestinal	Increases intra-abdominal pressure rhythmically, stimulates peristalsis	Reduced constipation, less gastroesophageal reflux
Pelvic floor	Stretches and strengthens levator ani, improves neuromuscular coordination	Shorter second stage of labor, fewer perineal tears, less postpartum urinary incontinence
Fetal	Improved utero-placental blood flow, optimal intrauterine environment	Reduced intrauterine growth restriction, lower risk of non-reassuring fetal heart rate patterns

3.4. Contraindications and Precautions

Yogasan are contraindicated or require medical clearance in: placenta previa (especially after 26 weeks), incompetent cervix or history of cervical cerclage, preterm labor or ruptured membranes, pregnancy-induced hypertension with severe features, intrauterine growth restriction with abnormal Dopplers, significant vaginal bleeding, and multiple gestation with complications. Specific postures to avoid: closed twists (Ardha Matsyendrasana), inversions (except Viparita Karani with wall support), deep backbends (Urdhva Dhanurasana), and any prone postures (Bhujangasana) after 12 weeks due to uterine compression [14].

4. Discussion

This review provides a systematic anatomical rationale for the Yogasan traditionally recommended to Garbhini in Ayurveda. The findings reveal that each posture specifically addresses one or more of the major anatomical challenges of pregnancy: pelvic girdle pain (addressed by Baddha Konasana, Upavistha Konasana, Malasana), lumbar hyperlordosis (Tadasana, Marjaryasana), reduced venous return (Viparita Karani, Supta Baddha Konasana with tilt), diaphragmatic restriction (Konasana, Trikonasana), and pelvic floor dysfunction (Baddha Konasana, Malasana).

The integration of anatomy with traditional prescription offers several advantages. First, it empowers clinicians to prescribe specific postures for specific complaints rather than a generic routine. For example, a Garbhini with symphysis pubis pain benefits more from Baddha Konasana (stretches adductors) and Upavistha Konasana (widens pelvic outlet) than from standing postures. Second, understanding the anatomical changes across trimesters allows modification: Malasana is encouraged in the second trimester to strengthen quadriceps but modified in the third trimester with heel support to reduce fall risk.

Modern evidence supports the efficacy of prenatal yoga. A 2024 meta-analysis of 25 RCTs (n=3,450) reported that regular prenatal yoga reduced the incidence of pregnancy-induced hypertension by 42%, preterm birth by 38%, and cesarean section by 34% compared to standard antenatal care [15]. Furthermore, the risk of postpartum depression was reduced by 57%, likely mediated by cortisol reduction and enhanced parasympathetic tone mechanisms directly linked to the anatomical effects described above.

Comparison with other forms of antenatal exercise reveals unique advantages of Yogasan. Unlike aerobic exercise (which increases sympathetic drive), Yogasan emphasizes conscious breathing and relaxation, maintaining utero-placental blood flow even during physical exertion. Unlike pelvic floor exercises alone (e.g., Kegels), Malasana and Baddha Konasana simultaneously stretch and strengthen the pelvic floor in a functional, weight-bearing context, which may be more effective for labor preparation.

Nevertheless, limitations exist. Most studies are observational or have small sample sizes. The heterogeneity of yoga interventions (duration, frequency, posture selection) complicates meta-analysis. Moreover, the anatomical explanations in this review are theoretical extrapolations from biomechanical principles; direct invasive measurements (e.g., pelvic floor EMG during Baddha Konasana in pregnancy) are ethically challenging. Future research should employ non-invasive tools such as dynamic MRI, 3D motion capture, and wearable sensors to quantify joint angles, muscle activation patterns, and pelvic floor descent during specific Yogasan in pregnant women.

5. Conclusion

Yogasan specifically indicated for Garbhini in Ayurveda are not arbitrary gentle movements but precisely targeted postures grounded in sound anatomical and physiological principles. Tadasana restores neutral spine alignment, Konasana expands thoracic capacity, Baddha Konasana and Malasana prepare the pelvic floor for labor, Marjaryasana-Bitilasana mobilizes the vertebral column, and Viparita Karani reverses venous pooling. Each posture addresses a distinct pregnancy-related anatomical challenge. When prescribed with trimester-specific modifications and appropriate contraindications, Yogasan constitute a safe, effective, non-pharmacological intervention that improves maternal musculoskeletal, cardiovascular, respiratory, and psychological health, and enhances fetal outcomes. Integrating this anatomical knowledge into routine antenatal care whether in Ayurvedic or allopathic settings can empower pregnant women with a holistic, evidence-informed tool for a healthier pregnancy and delivery. Future multidisciplinary research combining traditional wisdom, modern anatomy, and rigorous clinical trials will further refine these recommendations.

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