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Original Article

Day-Wise Embryonic Development in IVF And Ayurvedic Science Up to Implantation: A Comparative Integrative Review

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Abstract:

Infertility remains a significant reproductive health concern, and assisted reproductive technology has rendered the earliest stages of human development directly observable from fertilisation to implantation, while Ayurveda describes the same period through Garbhavakranti — the sequential transformation of Shukra–Artava Samyoga into Garbha, Kalala and the stages that follow. This narrative, comparative and integrative review was undertaken to correlate the day-wise developmental events of the human embryo from Day 0 to Day 10 with the Ayurvedic concepts of Garbhavakranti, Kalala Avastha, Panchamahabhuta and Tridosha, and to explore their possible clinical implications in reproductive failure. Classical texts including the Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya and Ashtanga Sangraha, together with their authenticated commentaries and indexed Ayurvedic literature, were studied alongside contemporary embryological literature retrieved from standard reproductive medicine textbooks, PubMed/MEDLINE and Google Scholar, convergence being assessed on morphological and functional characteristics rather than on any assumption of identical biological mechanism. A sequential correspondence emerged across the entire window: Day 0 gametes with Beeja within Garbha-sambhava Samagri; fertilisation and oocyte activation with Shukra–Artava–Jiva Samyoga and the emergence of Kalala; Days 2–3 cleavage with Vibhajana in Budbudakara form under the functional predominance of Vata and Vayu; Day 4 compaction with Samhanana under Kapha and Prithvi; Days 5–6 blastocyst formation and cavitation with Akasha, Vayu and Agni/Pitta; and Days 7–10 hatching, apposition and implantation with Garbhasthapana within a receptive Kshetra supported by Ambu.

On the basis of these correlations, a conceptual Panchamahabhuta–Dosha framework is proposed for the stage-localised interpretation of developmental failure, in which poor gamete quality and fertilisation failure are read as Beeja Dushti, cleavage-stage arrest as Vata Dushti, compaction failure as disturbance of Kapha and Prithvi, impaired blastocyst development and cavitation as Agni/Pitta with Akasha–Vata imbalance, and implantation failure as Kshetra Dushti with Apana Vata and Kapha involvement. The review thereby demonstrates a functional and morphological convergence between the modern day-wise description of preimplantation embryonic development and the Ayurvedic framework of Garbhavakranti, offering a hypothesis-generating, stage-specific approach to

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understanding reproductive developmental failure and to considering Ayurvedic principles alongside contemporary reproductive medicine. These conclusions carry clear limits: the Dosha and Panchamahabhuta assignments remain interpretive correlations rather than literal equivalences, and the proposed therapeutic framework has not been clinically validated. Further systematic, outcome-based research is therefore required before these correlations can be translated into clinical practice.

Keywords: Garbhavakranti; Kalala Avastha; Embryonic Development; Preimplantation Embryo; Panchamahabhuta; Tridosha; Beeja; Kshetra; Ambu; Implantation.

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Introduction:

Infertility is a significant global reproductive health concern, affecting a substantial proportion of couples of reproductive age and carrying considerable psychological, social and economic consequences.[1,2] Assisted reproductive technology, and in vitro fertilisation (IVF) in particular, has transformed its management since the birth of the first IVF child.[3] A defining strength of IVF is that it renders the earliest stages of human development directly observable — from the gametes on Day 0 through fertilisation, cleavage, compaction and blastocyst formation, up to implantation around Day 9–10 — with standardised grading at each daily checkpoint.[4] Yet unsuccessful cycles are still summarised through broad categories such as "implantation failure" or "poor embryo quality", which leave the actual stage of arrest unspecified. There is thus an opportunity to translate the stage-wise information generated in the laboratory into stage-specific diagnosis and targeted management.

Ayurveda describes the same sequence through Garbhavakranti —

गर्भस्यावक्रान्तिः अवक्रमण सम्प्राप्तिः। यथा गर्भतां संपद्यते इत्यर्थः। (अ.ह.शा. 1/2 अरुण.टी.)[5]

Garbhavakranti denotes the stage-wise formation of the Garbha from the union of Shukra and Artava within a receptive Kshetra.

शुक्रशोणितजीवसंयोगे तु खलु कुक्षिगते गर्भसंज्ञा भवति। (च.सं.शा. 4/5)[6]

Following Shukra–Artava Samyoga within the Kukshi, the conceptus is designated Garbha only upon the descent of the Jiva. It thereafter passes into Kalala, an unmanifest, fluid, mucoid state within which the Sanghata of the Mahabhutas is progressively established, and then into Budbuda, a vesicular, fluid-distended stage — the same post-fertilisation events observed in the laboratory as cleavage, compaction and cavitation.

Fundamental to this understanding is the principle that:

अत्र गर्भशब्देन मनःसंयोगाच्चेतनेनात्मनाधिष्ठितानां महाभूतानां विकारविशेष उच्यते। (अ.सं.शा. 2/2 इन्दु टी.)[7]

The Garbha is Panchabhautika in constitution, successive stages being characterised by the predominance of particular Mahabhutas and Doshas, which direct the movement, differentiation, transformation and cohesion underlying each phase.

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The Acharyas arrived at this account through Yukti, framing both the prerequisites for conception and the correction of reproductive failure in these terms. This review therefore correlates day-wise IVF embryo development (Day 0–10) with Garbhavakranti, identifies the points of convergence, and proposes a Panchamahabhuta–Dosha based therapeutic framework for each major category of IVF failure, positioning Ayurvedic Chikitsa as a complementary support to standard ART.

Materials and Methods:

Study Design and Sources: A narrative, comparative and integrative review correlating evidence-based embryological observations from IVF with the Ayurvedic concept of Garbhavakranti on a day-by-day basis. The classical texts consulted were the Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya and Ashtanga Sangraha (Sharira Sthana), with the commentaries of Chakrapani, Dalhana, Arunadatta and Indu, cross-checked against indexed Ayurvedic literature (DHARA, AYUSH Research Portal); from these, references pertaining to Shukra–Artava Samyoga, Garbhavakranti, Garbha-sambhava Samagri, Panchamahabhuta and Tridosha and their Chikitsa principles were extracted. Contemporary literature was retrieved from standard reproductive-medicine textbooks and from PubMed/MEDLINE and Google Scholar, using MeSH and free-text terms for in-vitro fertilisation, embryonic development, embryo grading, blastocyst, implantation and infertility; the Istanbul consensus and Gardner blastocyst grading[4,8] defined the day-wise milestones.

Inclusion and Exclusion Criteria: Sources were included if they described stage-wise development from fertilisation to implantation, gave standardised grading criteria for gametes, zygotes, cleavage-stage embryos or blastocysts, or described the Panchabhautika or doshic basis of Garbhavakranti and its Chikitsa. They were excluded if confined to post-implantation or Masanumasika development, or lacking full text or authenticated commentary.

Data Extraction and Correlation: The day-wise events of IVF (Day 0–10) and their grading parameters were tabulated, each day matched with its corresponding stage in early Garbhavakranti, and the predominant Panchamahabhuta and governing Dosha identified. Convergence points were those stages at which the two descriptions correspond in morphological appearance and, on interpretation, in functional character — not in demonstrated identity of mechanism.

Day-Wise Embryonic Development in IVF (DAY 0–10):

Day 0 — Gametes, Retrieval and Insemination: Day 0 begins with oocyte retrieval following controlled ovarian stimulation, with parallel preparation of spermatozoa. A mature metaphase-II (MII) oocyte has extruded the first polar body and is competent for fertilisation, whereas metaphase-I and germinal-vesicle oocytes are immature; cytoplasmic granularity and the appearance of the zona pellucida are also noted.[4,9] Sperm are evaluated for concentration, motility and morphology.[10] Fertilisation follows either conventional insemination or intracytoplasmic sperm injection (ICSI), in which a single spermatozoon is injected directly into the ooplasm — the technique of choice in male-factor infertility.[11,12]

Day 1 — Fertilisation and the Zygote: Approximately 16–18 hours after insemination or ICSI, fertilisation is confirmed by two visible pronuclei (2PN), one maternal and one paternal, with extrusion of the second polar body.[4] Entry of the spermatozoon triggers oocyte activation through the sperm-borne factor phospholipase C-zeta (PLCζ), which initiates repetitive intracellular

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calcium releases sweeping across the ooplasm as waves.[13] This signalling releases the oocyte from metaphase-II arrest, drives the block to polyspermy, and converts an inert gamete into a metabolically active, developing entity — in strictly observational terms, the moment at which the oocyte becomes living and self-directing.[14] Pronuclear size, alignment and nucleolar distribution are assessed by Z-score grading (Z1–Z4), higher grades relating to subsequent blastocyst development and implantation.[15] Abnormal fertilisation (1PN or 3PN) renders the zygote unsuitable for transfer.

Days 2–3 — Cleavage Stage: The pronuclear membranes break down and the parental chromosome sets are brought onto a common spindle; this restoration of the diploid state, termed syngamy, completes fertilisation about 20–24 hours after sperm entry, the emerging entity carrying a genome that is neither the mother's nor the father's but a new one.[16] The zygote then undergoes mitotic cleavage without net growth in size: by Day 2 (44–47 hours) it typically has 2–4 cells, and by Day 3 (68–72 hours) 6–8 cells. Grading is based on blastomere number appropriate to the day, symmetry, and cytoplasmic fragmentation — minimal (<10%), moderate (10–25%) or severe (>25%) — with multinucleation regarded as adverse.[4,17] Fragmentation and irregular cleavage rise with advancing maternal age, in parallel with increasing oocyte aneuploidy and mitochondrial deterioration.[18] Development here is guided predominantly by maternal transcripts, with gradual transition to embryonic genome activation, and this phase is one of the commoner points of arrest.

Day 4 — Morula and Compaction: By approximately 92 hours the embryo enters the morula stage, characterised by compaction: blastomeres flatten against one another, maximise intercellular contact and lose their individual outlines as tight junctions develop. This is the first overt sign of cellular organisation and polarity, initiating segregation of the inner cell mass from the trophectoderm and marking the transition from a loose cluster of cells to a cohesive structure.[19]

Days 5–6 — Blastocyst Formation and Cavitation: Around Day 5 (116–120 hours) the compacted morula develops a fluid-filled blastocoel through active transport across the outer cell layer — cavitation — and becomes a blastocyst, in which two lineages become evident: the inner cell mass (ICM), forming the embryo proper, and the trophectoderm (TE), contributing to the placenta. Blastocysts are graded by the Gardner system, recording blastocoel expansion and ICM and TE quality (A–C).[8] Slower embryos may reach blastocyst on Day 6; blastocyst formation and quality are among the stronger morphological predictors of implantation potential.[20]

Days 7–10 — Hatching, Apposition and Implantation: The expanded blastocyst completes hatching and, in vivo, adheres to the receptive endometrium, the invading trophectoderm establishing the earliest maternal–embryonic connection during the implantation window, around Day 9–10 after fertilisation.[21] Clinically, embryos are transferred on Day 5 or 6, so these events occur within the uterus rather than in culture; direct visualisation is not feasible in routine practice, but extended in-vitro culture models reproduce the attachment and outgrowth behaviour of this period.[22,23] Implantation depends on the coordinated readiness of both embryo and endometrium.

Garbhavakranti and Kalala Avastha in Ayurveda:

While modern embryology observes early development through the microscope, the Acharyas described the same sequence through Yukti and clinical inference, in terms of Panchamahabhuta and Tridosha.

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Garbha-sambhava Samagri: The Garbha does not arise from the gametes alone, but requires four prerequisites:

ध्रुवं चतुर्णां सान्निध्यात् गर्भः स्याद् विधिपूर्वकम् । ऋतुक्षेत्राम्बुबीजानां सामग्र्यादङ्कुरो यथा ॥ (सु.सं.शा. 2/33)[24]

Just as a sprout arises only when seed, season, soil and water come together, the Garbha is formed when Rutu, Kshetra, Ambu and Beeja are present together in the proper manner.

1. Rutu — The Fertile Period:

ऋतुस्तु द्वादशरात्रं भवति दृष्टार्तवः । अदृष्टार्तवाऽपि… ॥ (सु.सं.शा. 3/6)

The Rutu extends over about twelve nights from the onset of menstruation — the window in which conception may occur. In modern terms it encompasses ovulatory timing: oocyte quality varies with the hormonal environment of the cycle in which the follicle matures, and asynchrony between nuclear and cytoplasmic maturation yields a gamete that fertilises but arrests. Premature or delayed LH exposure, late-follicular progesterone elevation and luteal-phase defect are all disturbances of Rutu.[27]

2. Kshetra — The Field:

सुकृष्टे क्षेत्रे बीजं प्रक्षिप्तं तत्र व्रीहिः व्रीहित्वाय कल्पते, यवो यवत्वाय ॥ (भे.सं.शा. 8/2)[25]

Just as a seed sown in a well-prepared field grows true to its kind, a healthy uterine field supports the growth of the Garbha. The Kshetra corresponds to the receptive endometrium — adequate thickness and trilaminar pattern, spiral-artery perfusion, and progesterone-driven secretory transformation.[28] Its defining marker is the appearance of pinopodes, transient apical protrusions of the luminal epithelium whose time-limited expression, when premature, delayed or absent, marks a displaced window of receptivity.[29] Disturbances of Kshetra include thin endometrium, chronic endometritis, intrauterine adhesions, submucous myomas, adenomyosis and hydrosalpinx effluent — recognised causes of repeated implantation failure despite good embryos.[30]

3. Ambu — The Nutrient Fluid:

मातुस्तु खलु रसवहायां नाड्यां गर्भनाभिनाडीप्रतिबद्धा, साऽस्य मातुराहाररसवीर्यमभिवहति । तेनोपस्नेहेनास्याभिवृद्धिर्भवति ॥ (सु.सं.शा. 3/31)

The nutrient channel of the mother is connected through the umbilical cord to the Garbha, carrying the essence of her nourishment (Ahara Rasa) by Upasneha, and by this continuous nourishment its growth takes place. Before any vascular connection exists, the peri-implantation embryo is sustained entirely by histotrophic nutrition — endometrial glandular secretions termed uterine milk — until placental haemotrophic exchange is established.[31] Disturbances of Ambu therefore include inadequate secretory transformation, embryotoxic hydrosalpingeal effluent, impaired LIF and glycodelin expression, and defective glandular architecture following curettage or endometritis — at the stage when the embryo has no other source of nutrition.

4. Beeja — Shukra and Artava:

बीजं स्त्रीपुंसयोरार्तवशुक्रे ॥ (सु.सं.शा. 2/33)

The Beeja refers to the Artava in the woman and the Shukra in the man, corresponding to the gametes with their intrinsic competence: on the female side, oocyte quality, spindle integrity, mitochondrial function and euploidy; on the male side, sperm concentration, motility, morphology, DNA fragmentation, chromatin condensation and the presence of PLCζ.[10,13] The concept of Beejabhaga and Beejabhagavayava — defect in a portion, or sub-portion, of the seed — explains how an otherwise normal-appearing Beeja may still transmit a specific defect, mapping onto the modern distinction between gross gamete parameters and sub-microscopic chromosomal or single-gene defects that grading cannot detect. Conception is initiated by the Samyoga of Shukra and Artava

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within the Garbhashaya, in the presence of Atma and under the governance of the Doshas; Dushti in either results in failure of conception or defective development. These four factors ground the therapeutic framework that follows.

Jiva-pravesha — the Entry of the Atma: Ayurveda does not regard the union of Shukra and Artava as by itself constituting a Garbha; the conceptus acquires that designation only with the presence of the Jiva:

शुक्रशोणितजीवसंयोगे तु खलु कुक्षिगते गर्भसंज्ञा भवति ॥ (च.सं.शा. 4/5)

It is the conjunction of Shukra, Shonita and Jiva within the Kukshi that is termed Garbha. Sushruta likewise states that it is the Chetana-endowed entity (चेतनावस्थितं) upon which the Mahabhutas then act. The texts thus identify a discrete transition at which inert material becomes a living, self-directing entity, and place it at the moment of union rather than at any later stage of visible development.

Modern embryology identifies a comparable transition at the same point. The metaphase-II oocyte is metabolically arrested and, left alone, destined to degenerate; activation releases it, as sperm-derived PLCζ opens calcium channels producing oscillations that resume meiosis, remodel the sperm nucleus into the male pronucleus and switch on the embryo's metabolic programme. Failure of this signal — as in PLCζ-deficient globozoospermia — produces total fertilisation failure despite a spermatozoon lying inside a morphologically normal oocyte, corrected only by artificial oocyte activation.[14]

This parallel must be stated carefully. It is not proposed that the calcium oscillation *is* the Jiva, nor that Ayurveda anticipated calcium signalling; the two belong to different orders of explanation. What both systems independently identify is the same *structural* feature: that gametic union alone is insufficient, that an additional activating principle must intervene, and that without it the material remains present but lifeless. Ayurveda names this requirement Jiva-samyoga; embryology measures it as the calcium-mediated activation signal.

Kalala Avastha — The First Embryonic Stage:

तत्र प्रथमे मासि कललं जायते ॥ (सु.सं.शा. 3/18)

In the first month (its earliest phase), the embryo exists as the Kalala.

खेटः श्लेष्मा, तेन खेटभूत इति श्लेष्मसदृश इत्यर्थः ॥ (च.सं.शा. 4/9 चक्रपाणि टीका)

Chakrapani clarifies that *kheta* refers to Shleshma (Kapha); hence *khetabhuta* means "resembling Shleshma" — mucoid and jelly-like. The Kalala is therefore a fluid phase without fixed form, defined by fluidity and the absence of consolidation. This locates it before the morula, spanning the fertilised zygote and the successive cleavage divisions; compaction, in which blastomeres flatten and acquire solidity, is precisely the point at which that fluidity is lost, and the Kalala Avastha therefore terminates at the morula.

The texts further describe its progression into a bubble-like form:

प्रथमेऽहनि रेतश्च संयोगात् कललं च यत् । जायते बुद्बुदाकारं शोणितं च दशाहनि ॥ (हा.सं. षष्ठ. 1/17)[26]

On the very first day, from the union of the gametes, the Kalala is formed; and thereafter it assumes a bubble-like form (Budbudakara) along with Shonita. *Budbuda* denotes a rounded, fluid-filled, thin-walled body — morphologically, the cleaving embryo, whose translucent, closely apposed blastomeres within the zona appear under magnification as a cluster of bubbles. Budbudakara therefore describes the visible form the Kalala takes as it cleaves, not a stage separate from it.

Panchamahabhuta in Garbha Formation:

तं चेतनावस्थितं वायुर्विभजति, तेजः एनं पचति, आपः क्लेदयन्ति, पृथिवी संहन्ति, आकाशं विवर्धयति ॥ (सु.सं.शा. 5/3)

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Once the Garbha is endowed with Chetana, Vayu carries out its division, Teja (Agni) governs its metabolic maturation, Ap provides moistening and fluidity, Prithvi imparts consolidation and form, and Akasha enables expansion and growth. Each therefore aligns with a developmental event: Vayu with Vibhajana, the cleavage divisions; Agni with Pachana, metabolic activation of the zygote; Ap with the Kleda and cohesion of the jelly-like Kalala; Prithvi with Samhanana, the solidity of compaction; and Akasha with cavitation. The Garbha thus expresses a shifting predominance of these elements, moving from a water-dominant fluid mass towards a structure in which form and cavity are progressively expressed.

Tridosha in Embryonic Development: Vata, the principle of movement and division, directs the cleavage of the Garbha and the positioning of its parts (Vibhajana):

तेषां संयोगविभागे परमाणूनां कर्म प्रेरितो वायुः कारणम् ॥ (अ.सं.शा. 3)

In the union and separation of the minute constituent particles (Paramanu) of the Garbha, it is Vayu that impels their activity and serves as the governing cause.

वायुस्तन्त्रयन्त्रधरः… कर्ता गर्भाकृतीनाम् ॥ (च.सं.सू. 12/8)[6]

Charaka describes Vata as *Tantra-yantra-dhara*, the sustainer of the body's structure and mechanism, and — most relevant here — as *Karta Garbha-akriteenam*, the maker of the form and configuration of the Garbha, establishing Vata as the governing principle of embryonic division and morphogenesis. **Pitta** governs the metabolic conversion, maturation and Paka that drive development forward; **Kapha** governs the binding of constituents and the formation of stable, compacted tissue. In Samyavastha the three cooperate to produce ordered development; disturbance of any one produces a corresponding failure at the stage it governs. This doshic logic allows each category of developmental failure to be interpreted in Ayurvedic terms.

Discussion:

Comparative Correlation of Modern and Ayurvedic Accounts:

The day-wise correspondence between the two accounts is summarised below.

Day	IVF event and grading	Ayurvedic stage	Mahabhuta	Dosha
0	Gametes; MII maturity, sperm parameters	Beeja within Garbha-sambhava Samagri	Prithvi, Ap	Balanced Tridosha (Shuddha Beeja)
1	Fertilisation, 2PN zygote, oocyte activation, syngamy	Shukra–Artava–Jiva Samyoga → Kalala	Ap	Kapha, with Pitta (activation)
2–3	Cleavage to 6–8 cells; symmetry, fragmentation	Kalala in Budbudakara form; Vibhajana	Vayu	Vata
4	Morula; compaction, tight junctions	Samhanana; end of Kalala Avastha	Prithvi with Ap	Kapha
5–6	Blastocyst; cavitation, ICM/TE, Gardner grade	Cavity formation with differentiation	Akasha with Vayu	Pitta (Agni) with Vata
7–10	Hatching, apposition, implantation	Garbhasthapana within Kshetra, fed by Ambu	Prithvi, Ap	Apana Vata, Kapha

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Three points deserve emphasis. **Days 2–3 are the clearest point of convergence:** Ayurveda assigns the function that defines cleavage — Vibhajana, division — to Vayu among the Mahabhutas and Vata among the Doshas, and names the resulting form Budbudakara. The correspondence is thus not merely thematic but functional; and it carries clinical weight, since cleavage arrest is a common failure point and the age-related rise in fragmentation is readable as Vata Vriddhi with Dhatu Kshaya. **Day 4 marks a shared boundary**, compaction being at once the point at which the embryo first acquires solidity and the point at which the Kalala's defining fluidity is lost. **Days 7–10 impose the same dual requirement in both systems**, since implantation depends on a competent embryo and a receptive uterine environment at once — precisely what Garbhasthapana within a nourished Kshetra describes.

The two accounts may thus be read as describing one embryology rather than two: the leading element changes in step with the visible morphology, and the governing Dosha with the main biological function at each point.

Panchamahabhuta–Dosha Therapeutic Framework for IVF Failure:

If each stage is governed by an identifiable Dosha, failure at that stage can be read as a disturbance of that Dosha and addressed by a corresponding therapeutic principle.

Poor Gamete Quality and Fertilisation Failure (Day 0–1): When fertilisation fails or gamete quality is poor, the defect lies in the Beeja — Beeja Dushti, vitiation of Shukra and Artava driven by Dosha disturbance and depletion of the reproductive Dhatu. The Chikitsa Sutra is corrective at source:

स्नेहस्वेदवमनविरेचनास्थापनानुवासनैः क्रमशः उपचरेन्मधुरौषधसिद्धाभ्यां क्षीरघृतपुष्टं पुरुषं, स्त्रियं तु तैलमांसाभ्यामित्येके; सात्म्यैरेवेति प्रजापतिः ॥

Shodhana where indicated, followed by Rasayana and Vajikarana therapy to rebuild the Beeja.

Cleavage-Stage Arrest (Days 2–3): Failure to divide in an orderly, symmetrical fashion, or excessive fragmentation, disturbs the very function Ayurveda assigns to Vata. The diagnosis is Vata Dushti, the Chikitsa Sutra Vata-shamana with Brimhana and Snehana to restore smooth, nourished division.

Compaction and Morula Failure (Day 4): Failure of blastomeres to adhere and consolidate reflects deficiency of the cohesive, structure-giving functions — elementally Prithvi and Ap, doshically Kapha. The Chikitsa Sutra is Brimhana and Balya, building substance, cohesion and Dhatu strength.

Blastocyst and Cavitation Failure (Days 5–6): Failure to reach or expand as a blastocyst, or to differentiate ICM and TE, involves both transformation (Agni/Pitta) and the ordered formation of cavity and parts (Akasha and Vata). The Chikitsa Sutra is Agni Deepana to support Dhatu-paka, with Pitta-shamana where transformation is disordered, while maintaining balanced Vata.

Implantation Failure (Days 7–10): When good-quality embryos repeatedly fail to implant, attention turns to the Kshetra, the seating function of Apana Vata, and the adequacy of Ambu. The diagnosis is Kshetra Dushti with Apana Vata and/or Kapha imbalance, and the Chikitsa Sutra is Garbhasthapana: Kshetra Shodhana to correct the field, then Brimhana and Garbhasthapaka therapy to make it receptive and stable, with regulation of Apana Vata to enable proper seating.

Repeated or Multi-Stage Failure: Where failure is repeated or cannot be localised to a single

checkpoint, it is interpreted as broader depletion of Ojas and multiple Dhatus with multi-dosha vitiation. The Chikitsa Sutra is comprehensive preconception preparation: Shodhana to clear accumulated vitiation, followed by sustained Rasayana and Ojas-vardhana. The framework thereby converts a generic diagnosis of "IVF failure" into a stage-localised, doshically reasoned plan intended to run alongside the ART cycle.

Conclusion:

This review has traced early human development from Day 0 to implantation through two convergent frameworks: the day-wise timeline visualised in modern IVF, and the elemental–doshic account of Garbhavakranti through the Kalala Avastha. Placed side by side, they describe not different processes but one embryology in two observational languages.

The correspondence holds across the whole window: the Beeja of Day 0, the Kalala of Day 1, Vibhajana under Vata in Budbudakara form on Days 2–3, Samhanana under Kapha and Prithvi at Day 4, Akasha with Agni-Pitta at Days 5–6, and Garbhasthapana within a nourished Kshetra at Days 7–10. That such a correspondence emerges at the level of biological function is best read not as hidden ancient knowledge of cellular events, but as evidence that careful observation of one reproductive biology tends toward the same conclusions in any idiom.

The convergence also carries clinical utility: where each stage has a governing Dosha, the point of failure becomes a stage-localised diagnosis with its own Chikitsa Sutra, reframing a generic "failed cycle" as an individualised plan oriented toward preconceptional optimisation of the Beeja and Kshetra. These conclusions have limits — the doshic assignments are interpretive correlations rather than literal equivalences, the Jiva–activation parallel a structural analogy and not an identity, and the framework conceptually derived and unvalidated by outcome data. It is offered as a hypothesis-generating model, to be tested and applied only under qualified supervision alongside the reproductive medicine team.

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