

**KALADRAVYA VISHA VICHARA: THE CHRONOTOXICOLOGICAL
DIMENSION OF AGADTANTRA****Anurag Mishra^{1*}, Kavita Tiwari²**

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ABSTRACT

Classical Agadtantra, the toxicology division of Ayurveda, does not treat Visha (poison) as a fixed chemical entity. Instead, it treats Visha as a dravya whose virulence changes with kala - the hour at which it is administered, the season, the strength of the victim's digestive fire (agni), and, in a handful of passages, even the phase of the moon. Charak, Susruta, Vagbhata and Kashyapa, together with later nighantu and Visha-tantra compilers, return to this observation again and again, in different chapters and different words, yet no study so far has drawn these scattered kala-based statements together into one working model, or asked whether they anticipate the modern forensic sub-field of chronotoxicology, which studies how circadian, seasonal and physiological rhythms alter the pharmacokinetics and lethality of toxic agents. This article attempts that extraction for what appears to be the first time and are as follows:

- a) It catalogues kala-based potency statements across the principal Samhita and Visha-tantra sources under a four-axis taxonomy proposed here - dainika (diurnal), ritu-gata (seasonal), tithi-gata (lunar) and kosta-gata (digestive-state) chronovariance,
- b) It argues that this taxonomy amounts, in effect, to an implicit and non-instrumented chronotoxicological model that predates circadian pharmacology by well over a thousand years, and

c) It examines its possible forensic utility in postmortem interval and time of poisoning estimation, an application that has not previously been proposed in either the Ayurvedic or the forensic-medicine literature.

The article concludes that Kaladravya Visha Vichara deserves recognition as a distinct conceptual category within Agadtantra scholarship, and as a legitimate object of interdisciplinary forensic-toxicological enquiry.

KEYWORDS: Agadtantra, Ayurvedic toxicology, Chronotoxicology, Forensic medicine, Kala, Postmortem interval.

1. INTRODUCTION

Modern forensic toxicology has, since the closing decades of the twentieth century, accepted that identical doses of the same poison can run markedly different clinical courses, and produce different lethal outcomes, depending on the time of day at which they are administered, the victim's circadian phase, and seasonal physiological variation. This recognition has since hardened into a named field, chronotoxicology⁸. The circadian regulation of xenobiotic detoxification, and of drug and poison potency more generally, has by now been documented across pharmacodynamic, pharmacokinetic and cellular-clock research^{9,10}. What has gone unnoticed, in the Ayurvedic literature as much as in the forensic-medicine literature, is that classical Sanskrit toxicological text's had already articulated a structurally similar idea centuries earlier: that Visha is never a context-free agent, but one whose virya (potency) and vyapti (rate of spread through the body) are explicitly said to be modulated by temporal and physiological variables^{1,2}. This is not a marginal aside in the source texts. It recurs across the sutra, nidana and chikitsa sections of Visha discussion in several Samhitas, and yet it has never been drawn together into a coherent framework, let alone given a name. This article proposes the term Kaladravya Visha Vichara - roughly, discourse on the time-modulated poison substance - for this scattered body of statements and argues that it merits treatment as a distinct sub-topic within Agadtantra, with genuine translational relevance to forensic death-time estimation.

Working from this premise, the study set out with four connected aims: first, to identify and classify the kala-based (time-dependent) statements on poison potency that lie scattered across classical Agadtantra and allied Ayurvedic sources; second, to propose a four-axis taxonomy of this chronovariance – diurnal, seasonal, lunar/tithi-based and digestive-state-based; third, to place this taxonomy alongside the modern discipline of chronotoxicology and

to identify genuine conceptual parallels without overstating the equivalence between the two; and fourth, to explore, cautiously, whether the classical framework offers a heuristic - not an evidentiary - contribution to the forensic estimation of the time elapsed since poisoning in medico-legal casework.

2. MATERIALS AND METHODS

This is a textual-analytical and interpretive study and makes no claim to being a laboratory or clinical investigation. The primary sources reviewed were the Visha and Agada-related chapters of the *Charak Samhita* (Chikitsasthana, Kalpasthana)¹, the *Susruta Samhita* (Kalpasthana)², the *Astanga Hrdaya*³ and *Astanga Sangraha*⁴ (Uttarasthana), and the *Kashyapa Samhita*⁵, together with secondary compilatory works within the Visha tantra tradition, including the toxicology adjacent sections of the *Sarangadhara Samhita*⁶ and later nighantu commentary on Visha dravyas⁷. Statements bearing on time of day, season (ritu), lunar phase (tithi/paksha) and digestive fire (kostha/agni) as modifiers of poison severity, onset or curability were extracted, translated and grouped thematically by the authors. These groupings were then read alongside the modern chronotoxicological literature on circadian variation in xenobiotic absorption, hepatic metabolism and lethality thresholds^{8,9,11}, drawing on secondary summaries of that field rather than primary pharmacological data, since the purpose here is conceptual correlation rather than experimental validation.

3. RESULTS: A four-axis taxonomy of kala-based Visha chronovariance

3.1 Dainika (diurnal) variance

Several sources note that the same Visha acts with different speed and severity according to whether it is administered in the early morning, at midday, in the evening or at night, a pattern that maps loosely onto the classical tridosha diurnal cycle - kapha dominance in the early morning and evening, pitta at midday, vata in the late afternoon and night^{1,3}. Poisons described as pitta-vardhaka in nature are traditionally held to manifest more aggressively during pitta-dominant hours, while vata-aggravating toxins are said to show a delayed but more erratic (chala) course at night. In effect, this is a pre-instrumental hypothesis of circadian receptor or metabolic sensitivity: the notion that the same toxic dravya interacts differently with a body whose doshika state is itself cycling through the day, a notion structurally comparable to the modern finding that xenobiotic-detoxification enzyme activity follows its own circadian rhythm⁹.

3.2 Ritu-gata (seasonal) variance

Visha-vigyan sources consistently describe venoms and poisons of 'hot' (ushna) potency as more fulminant in grishma (summer) and comparatively muted in Sisira-hemanta (winter), and the reverse for 'cold' (sita) potency toxins, in line with the broader Ritucharya framework of seasonal dosha accumulation and provocation^{2,5}. This anticipates - structurally, not mechanistically - the modern recognition of seasonal and circannual variation in xenobiotic metabolism and toxin response¹⁰.

3.3 Tithi-gata (lunar-phase) variance

A more unusual and rarely discussed strand, found chiefly in the Keeta-Visha (insect/arthropod poisoning) and Sarpa-Visha (snake envenomation) chapters, links symptom severity to lunar phase, with several passages holding that envenomation occurring closer to the full moon (purnima) runs a more severe or rapid course than envenomation occurring closer to the new moon (amavasya)^{2,5}. This axis has been the most neglected in secondary Agadtantra literature, generally dismissed as astrological colour rather than examined as a proto-chronobiological claim. The present analysis suggests it deserves re-examination as a testable, if almost certainly indirect, biological correlate, rather than outright dismissal.

3.4 Kostha-gata (digestive-state) variance

This is the most physiologically grounded of the four axes. The texts hold, with some consistency, that a poison ingested on an empty stomach (kshudhita/rikta kostha) acts faster and more severely than one ingested after a meal (bhukta/purna kostha), because absorption is not slowed by the presence of ingesta^{1,4}. This is also the one axis with a direct, largely uncontroversial modern pharmacokinetic parallel - gastric emptying time and first pass modulation of oral toxin absorption, both established variables in chronopharmacokinetic dosing-time research^{9,11}. Its presence lends some credibility to the view that the less immediately verifiable axes - diurnal, seasonal and lunar - were not merely astrological ornamentation, but part of a genuinely observational framework about variable toxin behaviour, of which the kostha-gata axis was simply the most empirically self-evident instance available to the classical clinician.

4. DISCUSSION

4.1 Why this synthesis has not been attempted before

Existing Agadtantra scholarship has catalogued Visha classification by dravya (sthavara/jangama Visha), by symptom sequence (Visha-vega) and by treatment protocol (Visha-chikitsa) in considerable detail but has generally treated kala references as incidental

clinical caveats rather than as a coherent explanatory axis in their own right. Chronotoxicology, for its part, has developed entirely independently of Ayurvedic sources, and has not looked to pre-modern toxicological systems for conceptual antecedents - largely, one suspects, because Agadtantra's kala statements are distributed across disparate chapters and Samhitas rather than consolidated in a single treatise, which keeps the pattern invisible unless someone undertakes the kind of deliberate cross-textual extraction attempted here.

4.2 Toward a kala-informed heuristic for time-of-poisoning estimation

In medico-legal casework, estimating the interval between poison administration and death, or hospitalisation, is often difficult, particularly where the specific agent and the exact time of ingestion are unknown or disputed. The four-axis taxonomy set out above suggests a heuristic - explicitly not a substitute for chemical and circumstantial evidence - by which a forensic Agadtantra practitioner might contextualise an unusually rapid or unusually delayed clinical course. An atypically fulminant presentation for what is normally a slow-acting agent, for instance, might prompt inquiry into whether ingestion occurred on an empty stomach, in peak summer heat, or during a pitta-dominant part of the day, each of which the classical sources would predict as accelerating the course^{1,2}. This reframes kala not as astrological colour but as a set of case-specific modifying variables that a forensic examiner might routinely elicit - comparable in spirit, though certainly not in evidentiary weight, to the way modern forensic and clinical toxicology already account for dosing time and fasting state when interpreting drug and poison levels^{8,11}. The proposal stops well short of a quantitative dating tool; it is offered as an underused qualitative checklist drawn from a two thousand year clinical observational record.

4.3 Scope and limitations

The value of this synthesis lies in what it demonstrates taxonomically and historiographically, not in any claim that classical physicians possessed a chronobiological science equivalent to modern circadian pharmacology, and still less in any attempt to retroactively validate the lunar-phase axis, which remains the weakest and most speculative of the four. The contribution, rather, is to show that kala - dependent poison behaviour was a recognised, recurring and internally consistent concern across independent classical sources - coherent enough to warrant its own nomenclature and its own place in Agadtantra pedagogy and research, where at present it survives only as scattered footnotes within larger discussions of Visha dravya and Visha chikitsa. Naming Kaladravya Visha Vichara as a distinct sub-field also opens a legitimate avenue for hypothesis driven comparison with modern

chronotoxicological data^{8,9,10}, particularly on the two axes – dainika and ritu-gata – for which plausible physiological mechanisms already exist and are open to testing.

5. CONCLUSION

This article has, for what appears to be the first time, extracted and named the time-dependent poison-potency discourse embedded across classical Agadtantra sources as Kaladravya Visha Vichara, organised it into a four-axis taxonomy, and proposed its cautious use as a forensic heuristic for interpreting anomalous clinical courses in suspected poisoning. Neither the taxonomy nor the forensic proposal appears in prior Ayurvedic or forensic-medicine literature. Future work should map each axis against specific Visha dravyas individually, and, where feasible, correlate the kosta-gata and dainika axes against published chronopharmacokinetic data for comparable modern toxins.

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Declarations

Ethics Approval and Consent to Participate

Not applicable. This is a textual-analytical study of previously published classical Ayurvedic literature and did not involve human participants, animal subjects or clinical intervention.

Prior Informed Consent

Not applicable. No field data, knowledge-holder interviews or community-sourced information were used in this study; all material analysed is drawn from published classical texts and peer-reviewed literature.

Availability of Data

All primary and secondary sources analysed in this study are published works and are cited in the reference list; no new datasets were generated.

Conflict of Interest

The authors declare no competing or conflict of interest.

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Author Contributions

AM: Conceptualization, textual analysis, writing – original draft, writing – review & editing.

KT: Textual analysis, validation of Dravyaguna-related interpretation, writing – review & editing.

Both authors read and approved the final manuscript.

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