REFLECTIONS

Confessions of an Ayurveda professor

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Abstract

In this essay, I narrate my experiences of teaching Ayurveda physiology through an approach that involved laborious re-interpretation of ancient literature using the recent advances in the field of medical physiology. Though this approach made the ancient concepts and theories appear modern and relevant, it did not contribute much except for apparently reducing cognitive dissonance among students. I cite examples describing the processes of formation of shukra (semen) and rakta (blood) to show how we often overinterpret Ayurveda concepts to make them sound rational by proposing ad hoc conjectures. I illustrate why my previous writings were faulty by applying the falsification principle proposed by Karl Popper. I further explain how this approach made these concepts only verifiable but not refutable, and hence, non-falsifiable. I argue that instead of using such re-interpretation to prove obsolete concepts, they can be dropped altogether from the curricula of Ayurveda programmes. There is a need to develop a reliable method to identify such outdated content.

Keywords: *Ayurveda physiology, falsification principle, tridosha, strained interpretation, pseudoscience*

I am a teacher of Ayurveda physiology, and for the past twenty years or so, I have harboured a belief that advances in contemporary sciences must be used to interpret descriptions documented in ancient Ayurveda texts. This has been a central theme of most of my past writings. This belief originated in my training at postgraduate level, when we consulted the books of scholars such as C Dwarakanath, BG Ghanekar and Gananath Sen. These scholars ensured that modern anatomy, biochemistry, and physiology were abundantly used in their books to draw parallels between ancient and modern literature. Further, Banaras Hindu University offered me a unique opportunity to learn basic sciences like anatomy, physiology, pharmacology, biochemistry, microbiology, and pathology, and to look at Ayurveda literature through the current science lens. The background literature, especially by C Dwarakanath, VJ Thakar and VV Subrahmanya Sastri made me feel that my approach was legitimate and scientific. I even authored a book titled *Human physiology in Ayurveda,* which became quite popular among our students as it saw many reprint editions [1]. The book discusses how Ayurveda physiology and current physiology are not inherently distinct and how they can be merged effortlessly. The book contains chapters with titles such as "Cardiovascular System", "Digestive System" and so on, a pattern followed in most of the modern textbooks on medical physiology. I consciously selected the most rational versions of ancient aphorisms to make them appear relevant. I thought I was continuing the tradition of writing commentaries, wherein commentators amended the literature to suit their contemporary times. "This is a tradition that has kept Ayurveda vibrant and relevant", I always thought. I viewed all my writings as commentaries on ancient scriptures. I also felt that it was my duty to be loyal to my subject and to the acclaimed scholars in whose footsteps I was following.

What I did not realise was that my efforts at this stage were directed at seeking validation of what I was supposed to teach, which was otherwise mostly obsolete material. This urge for validation was possibly rooted in the frustration that I had developed when this subject was taught to me during my graduate studies. About thirty years ago, I had observed and even ridiculed the primitive and obsolete nature of physiology contained in our ancient textbooks. I wanted my students not to perceive the subject the same way as I had, and wanted them to read current physiology more seriously. Hence, I made every effort to legitimise ancient literature using a strategy of "strained interpretation" (drawing unintended but convenient meanings of certain words and phrases using cherry-picked references from commentaries) — which I called "rationalisation" — to make it sound modern and relevant. A few of my teachers who followed this strategy had had a profound influence on me as they made it possible for us to connect very well with the subject.

However, Covid-19-related restrictions offered me a chance to read a few interesting articles and books, and sufficient time to introspect on certain points, which probably wouldn't have occurred to me otherwise. This reading and introspection changed my perspectives so dramatically that I decided to write about it knowing very well that this might put my entire career at risk. But the truth must be told — and the earlier the better.

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Below, I trace how I changed my perspectives on the subject. The books and articles that have had immense influence on my new thinking have been listed in the reference section. I try analysing my own faults in my past writings and viewing these mistakes through the falsifiability principle.

The problem of *shukra*

Here, I discuss why my approach was wrong by taking the example of *shukra* (semen). This was the most disturbing concept that I had to deal with during my graduate studies. Though testicles have been identified as the roots of the channels that carry *shukra,* Ayurveda proposes the formation of the same in *majja* (bone marrow), for whatever reason [2]. Ancient scholars also felt that *shukra* existed in the entire body [3]. Since I found it difficult to make it sound scientific, I took some references from commentaries and argued that the term *"majja"* need not exclusively denote bone marrow, but could stand for all tissues that filled bony cavities. One reference from a commentary on *Sushruta Samhita* referring to the brain as *"Majja* present in the cranial cavity" offered relief [4]. Hence, *majja* became two substances to me — brain and bone marrow. I argued that translating terms such as *majja* needed to be done more cautiously as this could restrict the original broader meaning. Then, I took another reference from a commentary stating that two types of *shukra* may be identified— one indicative of semen and the other indicative of a substance that was present in the entire body [5]. Now, my knowledge of modern physiology made me relate GnRH and other hormones in the hypothalamic-pituitary-gonadal axis with the substance that circulated all over the body. Since one of my teachers had also suggested this interpretation, I found it convincing. Thus, I thought, we had solved the problem by bringing in clarity. While I knew that the existence of hormones had only been discovered in the recent past, it did not matter to me as my enthusiasm to prove ancient Ayurveda literature relevant was boundless. On the basis of my postgraduate training, I argued that such interpretations were valid. Though the ancient scholars did not know what hormones were, the concepts were amenable to re-interpretation. If such an interpretation could reduce cognitive dissonance (the holding of conflicting beliefs simultaneously) among our students, I thought, "why not?". Though I never suggested that the ancient scholars knew it all, I certainly made their writings sound relevant. "This is what all commentators have done", was my justification.

Formation of the blood

This is another example which shows that the ancient scholars did not know in which organ the blood was formed, because they did not know what blood-cells were. Their observations were limited by the tools and other means to which they had access. Using some indirect references and laborious re-interpretation, one can argue that bone marrow was considered as one of the places of blood cell formation; but clearly it is not the case. They thought that the liver and spleen were the organs that imparted the red colour to blood [6]. Vagbhata added *amashaya* (stomach) to this list [7]. Incorporating the knowledge from physiology that describes the role of the liver and spleen in erythropoiesis in early life, one could argue that these too are very important organs in the formation of blood. One could also argue that this was known to the ancient scholars. Considering the role of the stomach in absorption of vitamin B12, Vagbhata's proposition too can be justified. However, other than making our students feel that "physiology" is similar in both the systems, it does not serve any useful purpose. At the same time, in the name of re-interpretation, we do a disservice to our ancient scriptures. I must admit I have committed this error in my previous writings.

Even in my paper on the physiology of blood circulation, I have tried re-interpreting some principles of blood circulation that rest heavily on the writings of scholars such as VJ Thakar. My paper proposed that the description of three vascular segments such as arteries, veins and capillaries could possibly be traced back to Ayurveda literature. Similarly, by translating *rasa* as blood using some references from a commentary [8], it became easy for me to suggest that the scheme of blood circulation could be traced back to these ancient textbooks [9].

It is the same in other topics such as the role of kidneys in urine formation. Though there is no clear evidence to suggest that ancient scholars knew the physiology of urine formation, it can be argued otherwise through strained re-interpretation and can be made to sound as if they had this knowledge.

Now I realise that simply because the verses are amenable to interpretation, it is not in the true scientific spirit to superimpose modern science over classical references.

Rescuing *tridosha* theory

As *tridosha* theory lays the foundation for all aspects of Ayurveda, making it sound relevant was very essential for me. Ayurveda makes use of the concept of three *doshas, viz, vata, pitta* and *kapha,* to describe one's constitution, to explain physiology, to plan diet and lifestyle, to explain the pharmaceutical effects of herbs, to explain the pathogenesis of different diseases, to explain various symptoms and to plan therapeutic interventions. It is the fundamental theory that all Ayurveda students deal with during their entire educational programme. One of my teachers had already convinced me that this was a mere theory and did not represent any material entities in the human body — which, I thought, solved most of the problems. I went on to elaborate how different entities in the human body at different levels of organisation could fit in well within this framework. I also included the most recent advances in neuro-endocrine immunology to justify this theory. All these efforts made *tridosha* theory look very practical, modern, relevant, and attractive.

Where is the problem?

Though such interpretations could apparently reduce cognitive dissonance among our students, as shown in our research on teaching methods [10], the key question remains: "What additional contribution do they make to Ayurveda?" The fact is that many of these topics are no longer relevant, and need not be in the curriculum in the first place. Why should obsolete physiology be taught to our students at all? I realised that all my efforts were directed at making the prescribed curricular framework look relevant and rational. That such laboured misinterpretation could lead to clinical misapplication and misjudgement is something we tend to forget. Such an approach could also smother innovation [11].

The curriculum of the recently notified National Commission for Indian System of Medicine demonstrates some of these fundamental errors. It prescribes stringent instructional methods such as Objective Structured Practical Examination (OSPI) and Case Based Discussion (CBD), to teach clinical skills in assessing many Ayurveda parameters in physiology such as *dhatu-sara (*form of clinical examination to assess the structural and functional health status of different tissues in the body); whereas, in reality, the practical utility of this concept is yet to be determined and there exists huge inter-rater variability in its assessment. This means that, when two or more physicians independently assess *dhatu-sara* of the same set of individuals, the chances of obtaining a significant level of agreement among these physicians are not high.

Applying the falsifiability principle

I must admit that I stopped at this point, and did not ask difficult questions that could possibly have made my existence in the system irrelevant. "If I argue that most of the theories and concepts of Ayurveda physiology are irrelevant, why should I be part of the system? How can I even say that the subject which I was appointed to teach is mostly obsolete? Will it not be an injustice to my subject and to my institution?", and many such apprehensions kept me constrained within the prescribed curricular framework. However, change is not possible without introspection, and some disruption is required to trigger it.

Falsifiability is a principle that is used to distinguish between a scientifically sound theory and one that is scientifically weak. The concept of "null hypothesis" and "alternative hypothesis" proposed in our postgraduate research proposals has its origins in this principle. Karl Popper, the proponent of this principle, argues that "verifiability" is a weak proof to judge the validity of a theory. He takes examples from Freud's psychoanalysis, Adler's individual psychology and Karl Marx's theory of history to show how all these theories can easily be verified. He goes on to demonstrate how each one of these theories can be rescued by proposing ad hoc conjectures or assumptions or re-interpretations. In short, he suggests that theories that cannot be refuted (at least in principle) cannot be called scientific [12].

What I realised was that, all these years, we have been attempting to rescue our theories using re-interpretation by introducing ad hoc conjectures. For example, instead of a straightforward translation of *majja* and *shukra* as bone marrow and semen respectively, by adapting the strategy of laboured interpretation, I had brought in ad hoc conjecture to propose "two forms of *majja"* and "two forms of *shukra"*. This makes our theories look even more unscientific — which is what I did not realise.

Let us take up a hypothetical example to understand this more clearly. Suppose we plan a study to record resting blood pressures among adults of different *prakriti* groups. Let our hypothesis be that the individuals with *kapha prakriti* could be more prone to hypertension as they tend to gain weight easily and are likely to be leading a sedentary lifestyle because of the "heavy" *(guru)* and "slow" *(manda)* nature of *kapha*. *Kapha* could also be leading to plaque formation in the arteries because of its "oily" *(snigdha)* nature. However, let us assume that the results of our study suggest something very different: "individuals with *pitta prakriti* tend to develop hypertension more frequently than those of *kapha* individuals". Now we can argue that *"pitta prakriti* individuals tend to be more aggressive because of 'hot' *(ushna)* and 'sharp' *(tikshna)* properties of *pitta,* and hence, their overactive sympathetic nervous system might lead to hypertension". Thus, every result can be justified, irrespective of what our actual hypothesis was. In this example, though the original assumption stands falsified, we rescue the theory by proposing an ad hoc conjecture and re-interpretation. This way, our theories will never be "disprovable" or "refutable". Even in *Charaka Samhita,* similar ad hoc conjectures that were proposed to rescue the theory of *tridosha* have been observed by GL Krishna in one of his essays [13].

The way ahead

Alan Sokal, a reputed physicist, in an essay on pseudoscience has identified two categories of experts who advocate Ayurveda [14]. One of these groups refuses to accept the credentials of modern science by calling it "western ethno-science" and wants to retain Ayurveda as it is, whereas the other tries to portray Ayurveda as already containing the knowledge of all cutting-edge current research. This second group makes use of modern science to validate Ayurveda. Both these approaches are faulty and do not promote Ayurveda being subjected to rigorous scientific inquiry, he argues. Steven Engler has shown with examples that most Ayurveda literature does not fit into the current definition of "science" in its present form, though empiricism clearly exists therein [15]. When I read the book, *The Intelligence Trap* by David Robson, I could immediately relate it to many intellectuals who advocate Ayurveda, even though they may not have undergone any formal training in Ayurveda. This book delves into an emerging field called "evidence-based wisdom" [16].

Ayurveda clinicians have always been arguing that Ayurveda is a holistic science and the prescriptions they write are highly individualised. That they generally make this an excuse to evade scientific scrutiny, is what I have gathered. This escapist attitude serves neither science nor humanity. The current trends in Ayurveda research do not call for a re-examination of basic Ayurveda theories. For instance, the inter-rater variability of the assessment of *prakriti* is very high. But we have not asked the questions — "Does the *tridosha* theory need modifications?" or, "Can *prakriti* assessment be made more reliable by removing those markers / traits that lead to maximum divergence?". We assume that our texts are ever-relevant and irrefutable. Most of our research starts with the premise that these theories are true and are unquestionable [17-21].

In science, nothing should take precedence over finding the truth [22]. We must not hesitate to put our practices through scientific scrutiny. The scientific attitude is universal, and it cannot change from one stream to another. The immediate need is to evolve a rigorous method to identify such content in the present curricula of Ayurveda programmes that can safely be dropped. The logical next step is to subject our theories and principles to scientific scrutiny. Instead of teaching obsolete concepts in Ayurveda anatomy and physiology, the Ayurveda system deserves that our students be taught in-depth contemporary anatomy and contemporary physiology, since understanding the biological basis of a disease is essential for any physician, irrespective of the stream.

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References

1. Patwardhan K. *Human Physiology in Ayurveda.* Series No. 134. Varanasi, India: Jaikrishnadas: Chaukhambha Orientalia; 2005.
2. Sharma RK, Dash B, eds. *Charaka Samhita, Chikitsa Sthana,* Vol 4, Chap 15, (30-35). Second Edition. Varanasi: Chowkhambha Sanskrit Series Office; 2000; p 19-21.
3. Sharma RK, Dash B, eds. *Charaka Samhita, Chikitsa Sthana,* Vol 3 Chap 2, (46-49). Third Edition. Varanasi: Chowkhambha Sanskrit Series Office; 1998; p 103
4. Dalhana. *Nibandha Sangraha,* Commentary *on Sushruta Samhita, Sutra Sthana*, Chap 23: 9(12). National Institute of Indian Medical Heritage. eBook [Cited 2022 Jun 29]. Available from: https://niimh.nic.in/ebooks/esushruta/
5. Paradkar HS, ed. *Hemadri in Ayurveda Rasayana commentary on Ashtanga Hridaya, Sutra Sthana.* Vol 1, Chap 11, (37). Eighth Edition, Varanasi. Chaukhabha Orientalia. 1998; p 189
6. Murthy KRS, ed. *Sushruta Samhita, Sutra Sthana.* Vol 1, Chapter 14, (4). Second Edition, Varanasi. Chaukhambha Orientalia. 2004; p 87
7. Paradkar HS, ed. *Asthanga Hridaya, Sutra Sthana.* Vol 1, Chapter 12, (13). Eight Edition, Varanasi. Chaukhambha Orientalia. 1998; p 194
8. Sharma RK, Dash B, eds. *Chakrapani Datta in Ayurveda Dipika commentary on Charaka Samhita, Chikitsa Sthana,* Vol 4, Chapter 15, (36-38). Second Edition, Varanasi. Chowkhambha Sanskrit Series Office. 2000; p 22
9. Patwardhan K. The history of the discovery of blood circulation: Unrecognized contributions of Ayurveda masters. *Adv Physiol Educ.* 2012;36:77–82. https://doi.org/10.1152/advan.00123.2011
10. Joshi H, Singh G, Patwardhan K. Ayurveda education: Evaluating the integrative approaches of teaching Kriya Sharira (Ayurveda physiology). *J Ayurveda Integr Med.* 2013;4(3):138-146.
11. Krishna GL. Ayurveda's bane. *The Hindu.* April 15, 2018. [Cited on 2022 Jun 20]. Available at: https://www.thehindu.com/opinion/open-page/ayurvedas-bane/article23540373.ece
12. Popper K. Science as Falsification. Originally published in: *Conjectures and Refutations.* 1963. [Cited on 2022 Jun 20]. Available from: https://staff.washington.edu/lynnhank/Popper-1.pdf
13. Krishna GL. The Ayurvedic Dosha Theory: A Deconstruction. *Confluence.* July 11, 2019 [Cited on 2022 Jun 20]. Available at: http://confluence.ias.ac.in/the-ayurvedic-dosha-theory-a-deconstruction/
14. Sokal AD. Pseudoscience and Postmodernism: Antagonists or fellow travelers? In: *How pseudoarchaeology misrepresents the past and misleads the public.* Editor: Garrett Fagan. 2004. [Cited 2022 Jun 20]. Available at: https://physics.nyu.edu/sokal/pseudoscience_rev.pdf
15. Engler S. *"Science" vs. "Religion" in Classical Ayurveda.* Numen, Vol. 50, No. 4 (2003), pp. 416-463.
16. Robson D. *The Intelligence Trap – Why Smart People Make Dumb Mistakes.* Publisher W. W. Norton. Digital Version. ISBN 0393651436. (2019).
17. Krishna GL. The Need to Recast the Dosha Theory as a Heuristic. *The Indian Practitioner,* Vol.75 No.1 January 2022. [Cited 2022 Jun 20]. Available from: https://journals.indexcopernicus.com/api/file/viewByFileId/1453815.pdf
18. Krishna GL. Ayurveda awaits a new dawn. *Indian J Med Ethics.* 2022 Jan-Mar;7(1)NS:16-21. https://doi.org/10.20529/IJME.2021.093
19. Krishna GL. Ayurveda Needs an Intellectual Reinvention. *The Sciences.* November 24, 2020. [Cited on 2022 Jun 20]. Available at: https://science.thewire.in/the-sciences/ayurveda-needs-an-intellectual-reinvention/
20. Krishna GL. The History of a Superstition. *BMJ Blogs.* May 21, 2019. [Cited on 2022 Jun 20]. Available at: https://blogs.bmj.com/medical-humanities/2019/05/21/the-history-of-a-superstition/
21. Lakhotia SC. Need to Demystify Ayurveda. *The Indian Practitioner,* 2022; 75(2):10-11
22. Singh S, Ernst E. *Trick or Treatment? Alternative Medicine on Trial.* Bantam Press, 2008.