

DISCUSSION

Self-correction is essential to science: Author's response

KISHOR PATWARDHAN

I thank R Srivatsan [1] and Shailaja Chandra [2] for commenting on my reflective article [3]. While it is true that the scientific establishment has, on many occasions, betrayed the public trust because of the power and money associated with it, the same cannot be said of "science" as such. Science is an idea that places evidence-based thinking above everything else while understanding a phenomenon. The results of this endeavour often depend on how well people apply it in different situations. Thalidomide and Rofecoxib could be taken as two examples where the biomedical sciences have disappointed the public [4]. However, one must remember that science cannot be blamed for causing these disasters; instead, it is the "science establishment" that must take the blame. After all, was it not because of science that these mistakes were exposed? By "establishment" I mean the entire mechanism that plans and regulates drug development, safety testing, marketing approvals, post marketing pharmacovigilance, journal editing, publications, etc.

We must remember that the alternative medicine establishment, such as that of Ayurveda, is not devoid of industry and power influences, though the scale may be smaller. Hence, the adverse effects potentially associated with Ayurveda interventions cannot just be ignored [5]. In fact, Ayurveda classics have explicitly cautioned about potential adverse effects in many instances, such as after the administration of *Panchakarma* procedures [6].

Self-correction is a major characteristic of science. Ayurveda theories and practices should be subjected to this process of re-examination and self-correction. The assertion by Fontanarosa and Lundberg in this context is worth noting [7]. They argue that there is no alternative medicine, instead there is either "proven" or "unproven" medicine. When something from the alternative medicine domain is proven, it qualifies as good medicine.

Much like modern medicine, Ayurveda too is based on evidence-based thinking (*Yukti Vyapashraya Chikitsa*) [8]. My response to Srivatsan's comment [1] would be that I wish to see the artificial demarcation between Ayurveda and science fade away completely so that all that stands the scrutiny of research qualifies as science, and humanity receives the benefits of the same. Of course, while doing so, caution needs to be exercised to preserve and nurture the cultural facets of Ayurveda.

Banaras Hindu University, where I am serving as a professor, has many experiences to share when it comes to Ayurveda education. Madan Mohan Malaviya, the founder of the university, had started an experiment where the students were simultaneously trained in both Ayurveda and contemporary sciences through an integrated graduate degree programme. BG Ghanekar, one of the renowned teachers who taught at this university, records explicitly that the graduates who were trained under this programme were better equipped to cater to the primary healthcare needs of the community than those who were trained exclusively in either western medicine or Ayurveda. Dr Ghanekar, who was himself a formally trained expert in both the streams, states that the two sciences are in a continuum with each other and are not mutually exclusive. He further laments that this programme was discontinued despite its evident success because of powerful vested interests [9].

Shailaja Chandra in her comment [2] draws attention to the reforms required in the Bachelor of Ayurvedic Medicine and Surgery (BAMS) curricula. As Vaidyaratnam PS Warriar had suggested about a hundred years ago, it is high time the classical textbooks of Ayurveda are revised by incorporating newer knowledge [8]. While doing so, outdated speculations and theories should be strictly cast off. A committee comprising of Ayurveda scholars, educationists, practitioners, and biomedicine experts, if asked to take up this task, should be able to achieve this in the next five years or so [10].

The role of Ayurveda, as practised today, is mostly at the primary level of healthcare and not so much in secondary and tertiary care medicine. It must also be clear that our graduates would feel crippled if they were not able to use some essential life-saving drugs such as antibiotics in managing life-threatening emergency conditions. Many states have already done this through introducing amendments to The Drugs and Cosmetics Act [11]. This can at least make Ayurveda a feasible career option.

Author: **Kishor Patwardhan** (kpatwardhan@bhu.ac.in), Department of Kriya Sharir, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi — 221 005, Uttar Pradesh, INDIA.

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I have shown in my reflective article [3] how *ad hoc* conjectures are used to rescue our theories. My mention of the falsifiability principle was primarily aimed at shedding light on this aspect and not to prove anything else.

To quote George Thomas, "One wonders what psychological violence is being perpetrated on the students of these traditional medical methods by insisting on continuing to teach what is obviously wrong." [12] After explaining these crucial issues with examples, I hope there is no room left for any argument that seeks to retain outdated theories in the curricula and to continue teaching them as though they are eternal truths.

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