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Editorial

FOLKLORES IN MEDICAL SCIENCE

"If science's progress seems to slow, it's because its questions get increasingly difficult, not because there will be no new questions left to answer."

Tom Siegfried

There are plenty of folklores and myths in biomedical science in all dimensions. While a few of them may be apparently harmless, often they are counter-productive, if not dangerous for science. In general, such folklores and myths are anti-science in spirit, albeit they may have been utilized even as prescience in specific cases.

Myth variety 1

Bureaucrats, science managers and allied executives in all countries including India, and in many world bodies like the World Health Organization exert significant efforts to identify 'thrust areas', 'priority list' and 'strategic plan' for medical research. It is so widely practiced that many scientists even do not care to ponder and realize that it is a fundamentally flawed approach towards medical discoveries. When essential knowledge and understanding of certain scientific questions are severely lacking, announcing a priority bias with a time-table and a road map is not only meaningless, it is often an assault to medical research (1). Also, glossy popup items on scientists' work tables in the form of assured grant money in strategic plan of 'investment' may often allure them to divert the main course of scientific investigation (2). It is only a myth that medical research (and possibly any scientific research) provides crucibles for cooking new knowledge, new ideas and new products of immediate utility under the guidance of 'strategic plan'. Scientific research is rather a process and a culture that examines and, if necessary, changes existing notions and concepts. It is indeed worth investigating the damage caused to global medical research by the myth of so-called strategic plan for thrust area research in biomedical science.

Myth variety 2

Is it also not true that medical scientists themselves fall prey of myths and folktales by the wind of existing background knowledge ? One recent glaring case is the therapeutic use of mind-body relationship. Since antiquity, observers of different backgrounds including medical scientists and practitioners have indicated that mind plays an integral role in health and disease, although the issue of defining 'mind' has always been elusive (3). After the scientific evidence forwarded by Robert Ader and others that

behaviour, immune response and metabolic cues can be conditionally coupled, this notion has given birth to a new discipline of medical research, Psychoneuroimmunology, PNI (4). As a fall out of this recent trend, the bias created in mind-body medicine often indulges in different sorts of myths without any scientific basis (5). Given the fact of mind-body connection, there is indeed very little good scientific evidence that psychological and social interventions can 'directly' change the course of serious organic diseases (6). In the same vein, we also need to recognize that medical research on demystifying the human genome (Human Genome Project, HGP) has given birth to many myths and folklores that are, in true sense, anti-science (7). The scientific studies in PNI do not suggest as yet that top-down approach of so-called mind-body medicine will make the human body age-less and disease-free, and that scientific studies relevant to HGP do not promise that it will unravel a Midas touch to beauty, senescence, intelligence and genetic basis of individuality (7, 8). Given the socio-economic and biological bases of most prevalent diseases that human civilization is facing, it appears that either of the PNI and the HGP approaches will provide only minimum solutions to general health problems and sufferings of human beings. Although the underlying science for both issues promises novel dimensions to medical science and practice (9), false claims and unsubstantiated imagination will however hinder their actual movement.

Myth variety 3

Scientists themselves, very often unwittingly and at points possibly under the scourge of lack of good ethics and ethos in the practice of science, may inculcate myths and heresies. They tend to answer questions using their 'favourite' modules and models, and more than often these are trendy in contemporary practice (10). The cases of Walter Cannon's 'homeostasis' and Hans Selye's 'stress' concepts in physiology are quite exemplary in this regard (11, 12). In this context, it is worth recalling the invent of psychosurgery, especially frontal lobotomy introduced by the Portuguese neurologist Egas Moniz followed by its roaring practice (championed by Walter Freeman in the United States) across the world without necessary background scientific research (13, 14). Such overt inclination toward a model without sufficient scientific research tends to distort the basic structure of the issues concerned, and the investigator sees only the favourite model dissociated of the issues. The situation often becomes comparable to the condition of the disfigured rabbit as narrated in an American black folktale: brother rabbit loved fish so much that he once intended to catch fish in a pond using his nice tail (at that time the rabbit had a handsome tail) on a severe winter night; he was at a fix because his long, bushy tail was frozen inside the ice pool, and brother owl without understanding the actual problem pulled him by his ears (resulting in long ears in the rabbit) and ultimately dragged out brother rabbit minus his tail, a large portion of which remained frozen within the ice pool (15).

Myth variety 4

Of course, the most predominant type of myths in science, including medical science, evolves due to the mental inertia for accepted views generated in the larger community by strong theories, and by theories proposed by famous and powerful scientists. One such interesting case in the

history of medical science is the Starling principle of tissue fluid balance proposed by Ernest Henry Starling in 1896. The representation of Starling's hypothesis that a fluid balance is achieved by fluid loss from blood to tissues at the arterial end of the microcirculation and fluid uptake from tissue to blood at the venous end is supported by neither observation nor theory; nonetheless, this is an 'accepted view'. While there are increasing bulk of studies since 1960s that challenge the global view of tissue fluid balance as postulated by Starling (16), the myth of Starling principle seems to remain in the mainstream medical science because of the inertia of it being a 'truth' in the mind of medical scientists and practitioners.

Biomedical science shall always remain a fertile ground for folklores and myths, because there are many more commonly perceived questions in biomedical science compared with any other area of scientific study. It is evident from the fact that 16 issues of 25 basic major unresolved scientific issues relate to biomedical science (17). Also, the issues addressed in biomedical science are generally very close to our own existence and of direct interest. This reality along side the fact that there is a general decline in the rate of progress of science tends to provide props to veiled science, unsubstantiated imagination, falsification, and pseudo-science. Medical scientists need to be cautious and proactive against anti-science intrusions.

REFERENCES

1. Kornberg A. Of serendipity and science, 1995. (http://www.rockefeller.edu/pubinfo/pasteur/kornberg_essay.html)
2. There is a tale of Mullah Naseeruddin : One night Mullah saw a wise man searching the keys to his home under a lamp-post (although he had left his keys home), because he found sufficient light only under the lamp-post. Source: Shah I. *The World of Nasrudin*. Octagon Press, 2003.
3. Claude Bernard (1878) wrote, "In the perfected animal whose existence is independent, the nervous system is called upon to regulate the harmony which exists between all the conditions". Hobhouse (1901) in his book 'Mind in Evolution' examined the character and function of mind as the organizing principle in evolution. Crook (1980) in his book 'The Evolution of Human Consciousness' explains that Hobhouse used the word 'mind' to mean particularly the knowing capacity which functions in the construction of effective policies of behaviour with respect to individual group survival and reproduction.
4. Ader R, Felten DL, Cohen N. *Psychoneuroimmunology*. New York : Academic Press, 2001.
5. Angell M. Disease as a reflection of the psyche. *N Engl J Med* 1985; 312: 1570–1572.
6. Relman AS, Angell M. Resolved : psychosocial interventions can improve clinical outcomes in organic disease. *Psychosomat Med* 2002; 64: 558–563.
7. Hubbard R, Wald E. *Exploding the Gene Myth*. Boston : Beacon Press, 1993.
8. Arundhati. Impact of human genome project on biological sciences. *Indian J Physiol Pharmacol* 2000; 44: 121–124.
9. Bijlani RL. Revolution in medicine: redefining the role of basic scientists. *Indian J Physiol Pharmacol* 2004; 48 (Suppl): 19.
10. Conford F. *The Unwritten Philosophy*. Cambridge: Cambridge University Press, 1967.
11. Yates FE. Order and complexity in dynamical systems: homeodynamics as generalized mechanics for biology. *Math Compu Model* 1994; 19: 49–74.
12. Munk A, Naray-Fejes-Toth A. Glucocorticoids and stress: permissive and suppressive actions. *Ann N Y Acad Sci* 1994; 746: 115–130.
13. Blakemore C. *Mechanics of the Mind*. Cambridge: Cambridge University Press, 1977, pp. 178–180.
14. Lerner BH. Last-ditch medical therapy- revisiting lobotomy. *N Engl J Med* 2005; 353: 119–121.
15. Dance DC. Why the rabbit has a short tail. In: *From My People. 400 Years of African American Folklore*. New York : WW Norton, 2003, pp. 11–12.
16. For details see: Michel CC. Fluid exchange in the microcirculation. *J Physiol* 2004; 557.3: 701–702. [DOI: 10.1113/physiol.2004.063511].
17. What don't we know. *Science* 2005; 309: 78–102. [http://www.sciencemag.org]