What ails Medical research in India?

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Abstract:
In 1947, India had just 20 medical colleges admitting 1200 medical students. Sixty-seven years later, we have 412 medical colleges thatadmit49840 medical students each year. Although the numbers have gone up, the quality has gone down. Most colleges lack research culture, supportive infrastructure, and trained teachers to conduct research. If the existing scenario is so dark, is there any light at the end of the tunnel? Of late, we see a large number of medical students who use ICMR short term studentships and conferences to wet their feet in medical research. If even a handful of our ICMR STS scholars take to serious research later in life, we could see world class medical research that could make Narayana Murthy justifiably proud.

On July 16, 2015, speaking at the Indian Institute of Science in Bangalore, Mr Narayana Murthy, the co-founder of Infosys lamented that there has not been a single invention from India in the last 60 years that became a household name globally, nor any idea that led to “earth shaking” invention to “delight global citizens”. Listing out 10 major inventions that Massachusetts Institute of Technology has created in the last 50 years that includes Global Positioning System, Bionic Prostheses and Microchip, Murthy said these happened because students and faculty at MIT “walked the untrodden path, asked the unasked questions and used their intellectual prowess to take huge leaps”.

Cynics argue that can a country with poorest health statistics, dirtiest rivers, highest pollution and one of the poorest primary education foster any ideas other than those for mere survival, let alone innovate and invent? We ought to understand, they argue, that science is no longer simple anymore. As an example, Matthew Herper found that the Pharma industry spent $802 billion to gain approval for just 139 drugs: a astounding $5.8 billion per drug. It requires massive funding, human resources and infrastructure to be able to do a world-class research and institutes in other countries have departments dedicated to that. Today, neither the institutions nor the government or funding industries are interested in adequately funding R and D. Then, how do we renovate?

Take, for example, MIT. MIT has an R&D budget of $824 million and nearly half of it comes from the federal government. The Johns Hopkins University has a budget of $ 2.1 billion; $ 1.87 comes from the federal government. By contrast, India ranks lower than most BRICS countries when it comes to funding the research- five times lower than China. Brazil, the world leader in research on tropical medicine, spends 1% of its fast-growing GDP on research, half the rich-world share but almost double the average in the rest of Latin America. A third of the scientific papers by Brazilians now have a foreign co-author.

But can generous funding alone guarantee good quality research? The answer is no. In 1994, Doug Altman, the famous British statistician argued in an editorial provokingly titled “The Scandal of Poor Medical Research” that most medical research, worldwide, was of poor quality and misleading. “What should we think about researchers who use the wrong techniques rather willfully or in ignorance, use the right techniques wrongly, misinterpret their results, report their results selectively, cite the literature selectively and draw unjustified conclusions?” he asked. Researchers do so, Altman explained, “Because they feel compelled for career reasons to carry out research that they are ill-equipped to perform and nobody stops them. In other words too much medical research is being conducted by amateurs who were required to do some research to progress in their medical careers.”

In 2005, John Ioannidis (currently professor at Stanford) showed that almost none of the thousands of research reports linking foods to conditions are correctly and how only 1% of thousands of studies linking genes with diseases are reporting linkages that are real. His famous paper, “Why most published research findings are wrong” is one of the most cited papers of PLoS Medicine. “Most scientific studies are wrong, and they are wrong because scientists are interested in funding and careers rather than truth. Researchers are publishing studies that are too small, conducted over too short a time, and too full of bias to get promoted and secure future funding,” he argued.

Marcia Angell, a physician and longtime editor in chief of the New Journal of Medicine said “It is simply no longer possible to believe much of
the clinical research that is published, or to rely on the judgment of trusted physicians or authoritative medical guidelines, I take no pleasure in this conclusion, which I reached slowly and reluctantly over my two decades as an editor of the New England Journal of Medicine.” And more recently, on April 15, 2015, Richard Horton, the current editor-in-chief of the Lancet wrote that a lot of published research is, unreliable at best, if not completely false. “Afflicted by studies with small sample sizes, tiny effects, invalid exploratory analyses, and flagrant conflicts of interest, together with an obsession for pursuing fashionable trends of dubious importance, science has taken a turn towards darkness,” he lamented.

What is the quality of medical research from Indian medical schools? In 1947, India had just 20 medical colleges admitting 1200 medical students. Sixty-seven years later, we have 412 medical colleges that admit 49840 medical students each year. Although the numbers have gone up, the quality has gone down. Most colleges lack research culture, supportive infrastructure, and trained teachers to conduct research. Most medical teachers have either not been trained in research methodology or lack zeal and passion to design a study. They publish articles not because they are genuinely interested in research but because a publication is a passport to the promotion. Teachers often use unethical methods to get an article published- they become the first authors of a PG thesis, dredge data, and their paper finds its way in one of the obscure internet based “international journal”. The paper never gets cited, let alone read, but improves the probability of getting an appointment or a promotion. The Publish or Perish syndrome, prevalent in USA had led to high-quality research published in high impact journals. By contrast, Publish or Lose Promotion syndrome in India has led to low-quality research being published in journals with zero impact. This gets rubbed on the post-graduates and is now slowly percolating the medical students as well. Thus, most medical research published from India is not worth even the price the paper that it is typed on!

If the existing scenario is so dark, is there any light at the end of the tunnel? There is. Of late, we see a large number of medical students who use ICMR short term studentships and conferences to wet their feet in medical research. In our institution, we designed a series of workshops aimed at training both the ICMR STS awardees and their mentors. The students teamed with their mentors, identified research questions, designed their studies, wrote research protocols, obtained approvals from the Institutional Research Board, collected data, learned how to use Excel and Stata to analyze data and acquired tips and tricks on how to write a paper. Given the lack of time, funds and active mentors, medical students were not be able to think beyond box and come up with original ideas. We, therefore helped them design a study that was pragmatic and doable. We also found that most students found it difficult to strike a right balance between research and their classes, clinics and labs. And yet, not only did some medical students complete their STS successfully; a few went on to publish their papers in high-impact journals. If even a handful of our ICMR STS scholars take to serious research later in life, we could see world class medical research that could make Narayana Murthy justifiably proud.