

COMMENTARY

Medical Research in India

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Introduction

The significance of medical research cannot be exaggerated in present scenario. The objective of medical research is to advance healthcare. A journey into olden times tells that the earliest account unfolding a medical trial is reported in the Book of Daniel, where Nebuchadnezzar, the Babylonian king ordered youths of royal blood to consume only red meat and wine for three years, while other set of youths ate only beans and water.¹ The trial was aimed to establish whether vegans were healthier than youths who took wine and red meat. At the endpoint, the experiment concluded that the youths who ate only beans and water were healthier.²

The health-care structure throughout the world has observed a major revolution with technological progresses. The augmented longevity of the humankind today has been the consequence of decades of global medical research, ensuing in developments in diagnosis and management.³ Besides upgrading public hygiene, the newer noninvasive procedures of diagnosis, innovative drugs and extraordinary technological progress in treatment and patient-management have all blessed to the longer life span.⁴ This further insists on applied study for formulating new

drugs, tests, imaging techniques, surgical procedures etc, particularly because of the growing population load and extended lifespan. Considering the fact that India is responsible for a fifth of the world's contribute to diseases, the health research outcome needs to be considerably enhanced in India.³

Financial support and management for research and development

Although still below 1% of GDP, financial support for research and development in science and technology are growing in India,⁵ covering agricultural, biological, biomedical, chemical, physical, mathematical, earth, engineering and materials sciences, and social sciences.⁶ More than 50% of research in India is sustained with public funds from the Government of India, through foundations including the Department of Biotechnology (DBT), Department of Science and Technology (DST), Council for Scientific and Industrial Research (CSIR), Indian Council of Medical Research (ICMR) and Department of Atomic Energy (DAE).⁶⁻⁸

There are further prospect for research through international funding partnerships such as the Wellcome Trust/ DBT India Alliance (India Alliance), European

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Molecular Biology Organization (EMBO) and the Human Frontier Science Program (HFSP). Some philanthropic organizations including the Bill and Melinda Gates Foundation, Howard Hughes Medical Institute, Simons Foundation, Tata Trusts and Wellcome Trust also support research projects in India.

Financial Support in Health Research in India

The total approximated health research financial support in India was US\$ 1.42 billion in 2011–12. This had enhanced at approximate 8.8% yearly over the preceding 5 years (2007–08 to 2011–12).⁹ The approximate amount of per capita GDP expensed on health research in India is approximately one-fifth of the amount than that is spent in South Korea or in the UK.^{10,11} It is fascinating that grant of health research by the Ministry of Science and Technology was higher than that by the Ministry of Health.¹²

During 2007–12, the reported funding for research on non-communicable diseases raised substantially.¹²⁻¹⁴ However, the stated funding was considerably less for a few of the important sources of non-communicable disease load such as cardiovascular disease, chronic respiratory disease, mental health and musculoskeletal disorders in comparison to their contribution to the disease burden, signifying that the comparatively larger shares were being spent on diseases with lower burden. Tuberculosis, HIV/AIDS, and tropical diseases including malaria reported for higher support as compared to the illness load^{15, 16} With India still suffering with important burden of neonatal disorders,^{17, 18} the estimated funding for these circumstances was low. While the degree of burden by an ailment is a valuable determinant for research funding, there would be other conditions as well to prioritize funding for specific diseases that

are of particular attention to India, e.g. those that are identified for elimination or those that are India centric.

Diversity of health research in Indian organizations

Needless to mention that institutions such as the All India Institute of Medical Sciences (AIIMS) and Indian Institutes of Technology (IITs) impart excellence education in medical and engineering disciplines, respectively, and are also well recognised for their research endeavours.⁶ On the contrary, a research output from 579 medical institutions and hospitals in India during 2005-2014- revealed a gloomy scenario.¹⁹

Contribution of human resources, patient load and infrastructure in Health Research

Medical institutions in India are supposed to be actively engaged in research, since all postgraduate candidates need to perform some “original” research work as a part of curriculum to earn the degree.³ Besides, the various criteria for appointments and promotions of health care personnel require original research publications as essential components.²⁰ Curriculum Implementation Support Program (CISP) rolled out by the Medical Council of India (MCI) directed two months mandatory research activities for the under graduate students.²¹ In addition, ICMR encourages undergraduate students for short term research fellowship.²² Thus, there are, in principle, substantial personnel for implementation research in the medical institutions. Regrettably, only a small share of this huge work force has the scope to work at places with so-called well-equipped infrastructure.²³ Most others remain engaged in awfully extensive incessant “duty” hours. They are also forced by inflexible time-limit for finishing

the “research” element of the degree. Therefore, the research outcome remains unsatisfactory. The enormous benefits accessible by the human resource on one hand and the variety of Indian population on the other is almost entirely lost, and Indian health system maintain to believe, for diagnosis as well as prognosis, on information generated largely in Western countries with very dissimilar genetic and physiological backgrounds.³

The formal teaching assignment of a common medical college faculty generally is not as high as those teaching in basic science departments in a university or college, although in majority of the clinical disciplines, teaching is carried out in OPDs, wards and on the operation table as well, fairly similar to “teaching” that goes on in basic research labs.³ A general excuse for the restricted research output from medical institutions is that huge patient load amidst meagre infrastructure which leaves faculty members with limited time and vigour to design any serious research.²⁴

However, the medical faculty in better equipped medical institutions may not be involved with OPDs/surgeries or wards on every working day and, therefore, the average workload per week may not be unusually or disproportionately high.³

Road blocks

A strong hierarchical and authoritative setup in medical institutions prevents the zeal of young and proficient faculty who desire to go beyond the conventional health-care.²³ A healthy academic and productive environment stipulates equal contribution, incentives and prospects for research.

Medical institutions also have “pre-clinical” or “para-clinical” departments/units whose faculties have limited clinical practices or patient care. Regrettably, even their research output is also typically not

notable.³ Despite our *ad libidum* admiration of practices pursued in western countries, Indian system has maintained the medical education and research segregated from basic sciences as well as technology. Although integrative learning and teaching models have been often argued in the country, the truth is that medical education in India continues to ensure compartmentalization and disintegration.

It is indeed also depressing that while we could not achieve any significant inroads in modern medicine, we have also failed to exploit on our age-old health-care system of AYUSH (Ayurveda, Yoga, Unani, Siddha, Homeopathy), in spite of our sense of pride at the great wisdom of our far-removed ancestors. It is noteworthy that Chinese Medicine has been integrated as a part of formal Medical curriculum in China.

Sometimes “conflict of interest” emerges when medical career is governed exclusively to treat patients and earn the livelihood in return. Another cause for pitiable performance could be the lack of mentors among faculty who can inspire and motivate young enthusiastic minds to take up medical research as a career. Therefore, it is essential for institutes that are engaged in medical research to identify the need for fostering collaborative bindings between clinicians, basic scientists and biomedical experts.

Concluding remarks

India has assets of human resources. However, identifying factors responsible for this sorry state of affairs is important. Some consider that the clinical load in big hospitals is a major cause for sub-optimal performance, leaving less time for fruitful research. However, this view does not always hold true as the maximum number of high quality publications comes out from institutions that serve the highest number of patients of different categories.

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