

## Public health systems research: evidence-based integrative medicine provides leadership in chronic care

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The Institute of Applied Dermatology (IAD), Kasaragod, Kerala is applauded by Ryan<sup>1</sup> who thinks its studies might have delighted William Osler and that 'Oslerian wisdom' would balance IAD's advances in medical science and effective care for the suffering poor in Indian villages. He advocates partnership and collaborations with traditional Indian systems of medicine (ISM) to bring this much needed change in public health. An integrative medicine (IM), the outcome of such collaborations, is best suited for treating complex and chronic diseases that are influenced by the environment. IM combines practices of alternative medicine with those of allopathic medicine. Recently, IM has grown in popularity because of its focus on the whole person and its use of therapeutic approaches from biomedicine, alternative medicine and ancient healing systems. With increasing healthcare costs globally, IM is especially favourable because of the often inexpensive nature of its treatment protocols.

Those trained in more than one system of medicine, including ayurveda, homeopathy and allopathic medicine, are known in India as multi-speciality doctors<sup>2</sup>. Despite many such doctors in service, few examples of evidence-based IM directly translating to patient care exist. Two evidence-based IM treatment protocols drawing worldwide attention are for common diseases occurring in India: lymphatic filariasis and vitiligo<sup>3</sup>.

Significant quality of life improvements are recorded due to IM in long-term management of chronic diseases such as lymphatic filariasis (Figure 1). Because people in Indian villages often rely on traditional healing methods as their sole source of healthcare, collaboration between traditional ISM and modern biomedicine is essential for optimal improvements in the treatment of disease in these resource-poor settings. However, a number of questions arise regarding the feasibility and efficacy of this type of integrated system. How can we best make use of both systems of medicine? How can we approach evidence-based medicine in this field? When is it best to

use ISM, biomedicine or both? Indian organizations are beginning to answer these questions. Herbal medicine and its identification, preparation, dosage and use are part of studies on ISM and require a comprehensive understanding of the frameworks of allopathy and related sciences. Analysis of IM patient-care protocols in IAD ([www.iad.org.in](http://www.iad.org.in)) demonstrates that a traditional procedure used in ayurveda, oil massage (*udwarthana*) allows for the absorption of 50–70 ml of oil into the skin of lymphatic filariasis patients<sup>3</sup>. Evidence-based medicine has also shown the lack of effectiveness of some ayurvedic techniques. For example, modern pharmaceutical research suggests that vehicles used in topical preparations of ayurveda, such as water and ghee, are less effective in delivering agents through the skin of patients. In addition, current methods of manufacturing and dispensing in ayurveda may lead to degradation of active ingredients. Currently available information and computer technology (ICT) tools is inconclusive in assessing the possible interactions of ISM with modern drugs. Further, animal experimentation for toxicity and efficacy trials need to apply disease determination methods of ISM on animal models<sup>4</sup>. Such studies should aim to enhance the clinical potential of drugs used in ISM. Practically the

clinical approach to disease is similar in allopathy and ayurveda. Allopathy is more structured and advanced in clinical methods. Ayurveda has a large pharmacopoeia and its medicines are locally available and safer than allopathy. Since large populations depend on ISM for their routine healthcare, it is essential to enhance their clinical potential. This approach would be cheaper and easier than isolating molecular drugs from these formulations.

IM requires the collaboration of multiple disciplines and team members with diverse backgrounds. Such a team should comprise physicians and scientists working together. In the IAD model<sup>2</sup>, the patient is first given a detailed counselling about the disease. This is followed by individual evaluations by allopathy, ayurveda, yoga and homeopathy doctors. All doctors confer with ICT to best design a treatment regimen that minimizes drug interactions and side effects of botanical ingredients and maximizes efficacy. Botanists and pharmacists are often consulted to assess the medicinal properties of the botanicals involved in treatment and improve medicinal compliance. Physiologists and pathologists contribute to the team's understanding of the disease-specific pathological mechanisms and the unique intricacies of the case. Based on these insights and after receiving a



**Figure 1.** Response to treatment following integrative medicine in elephantiasis (lymphedema) due to lymphatic filariasis.

patient's written consent, a trial IM treatment is initiated. Medical pharmacists contribute to the delivery of treatment by sorting raw materials, supervising preparation of traditional drugs and dispensing drugs. Dermatology nurses are crucial members of the IAD team as they monitor the delivery of IM treatments. The allopathy outcomes are then measured and statistical analysis performed. Documentation and publication of the study findings require special skills and experienced mentoring through individual or institutional collaboration.

The physician–scientist is a model visualized by James Shannon (1904–94), the father of the modern National Institutes of Health, USA. This is a programme to train M Ds in Ph D. These are broad-based investigators who hypothesize or discover fundamental biological mechanisms and apply these insights directly to the treatment of diseases<sup>5</sup>. The model practised at IAD is similar to that of the physician–scientist sans collaboration for *in vitro* studies. The IAD model could be practised in India as the Department of Health Research (DHR), Government of India, approves such studies and direct use of existing medicinal formulations in the treatment of patients without *in vitro* studies. However, the IAD experience posed new challenges in the practice of IM. Though the ISM formulations used were safe, cheap and locally available, they had low clinical potential resulting in either delayed outcome or requiring larger drug dose. This is in general the experience of most medical practitioners of ISM, who play a lead role in the healthcare delivery of rural India. Future studies should explore untapped pharmacopoeias of ISM to enhance the clinical potential and clearly define indications for their use. This would mean that the practitioner of ISM would make the diagnosis in the same traditional way, but use the drugs with enhanced clinical potential for the same traditional indications. Undoubtedly this would increase the efficacy of ISM drugs, deliver primary care at low cost and save precious medicinal plants; however, little expertise is available to guide such research and patient-care programmes. A module for specialization on IM could be built on the physician–scientist model. Such a module should

combine essential practical and research skills of different specialities such as biomedicine, traditional medicine, pharmacology, pharmaceuticals, pharmacogenosy, botany, pathology, physiology, pharmacy practice, biotechnology and molecular biology. The module should teach major prevention strategies in alternate systems and address challenges to the control of diseases. Subject-specific collaboration with psychiatry, bioengineering, etc. must happen for palliative care and to improve devices and diagnostics. IM modules for teaching and research would have to be developed through voluntary networks by consolidating the hands-on skill available in a few centres and groups.

IM should be developed as a discipline of health systems research to manage public health issues as a low-cost, locally accessible, evidence-based and safe healthcare for communities. Public health systems research is defined as 'a multi-disciplinary field of study that recognizes and investigates system-level properties and outcomes that result from the dynamic interactions among various components of the public health system and how those interactions affect organizations, communities, environments, and population health status'<sup>6</sup>. The IM protocol at IAD and a public health systems research design are in many respects similar in their function and contribution to society. The components of both these systems travel in parallel to achieve results that affect the communities and various components of public health systems, including the stakeholders and keeping the patient at the centre of the system. Involvement of wide expertise should ensure participation of management, policy and development from social sciences. The concept of system leadership should be developed within the specialized disciplines of IM. A system leadership is necessary 'to break through the status quo'. 'Systematic forces, sometimes called inertia, have the upper hand in preventing system shifts. It will take powerful, proactive forces to change the context of application. This can be done through systems thinking in action. These new theoreticians are leaders who work intensely in their own schools, or national agencies, and at the same time connect with and participate

in the bigger picture. To change organizations and systems will require leaders to get experience in linking other parts of the system. These leaders in turn must help develop other leaders with similar characteristics.<sup>7</sup> Therefore, developing IM as one of the leaders in public health delivery systems for care of chronic diseases is essential to deliver healthcare to every stakeholder, breaking the existing urban–rural divide. This will also help economically leading to improved and specialized care delivery for chronic diseases globally.

To achieve this change willingness of the Government to support genuine teams conducting such experiments and consolidating the evidence is a requirement for the benefit of national healthcare. The 12th Plan document (2012–17) of DHR has a plan layout of Rs 500 crores for trans-disciplinary and integrative research<sup>8</sup>. DHR needs Balaram's science invasion<sup>9</sup> and Ryan's Oslerian wisdom<sup>1</sup> to utilize this plan to build IM in support of public health approaches to chronic care in India.

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