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VIEWS AND REVIEW

Barriers to evidence based medicine practice in South Asia and possible solutions

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Abstract

The South Asian countries share common health challenges with very poor health indicators in the world. This is primarily because of political apathy, poverty and staggering health infrastructure. In resource-limited countries, an evidence-based approach can rationalize the treatment and be cost-effective by reducing clinical practices that have no proven benefit. However, at present, evidence-based medicine is virtually non-existent because of its inherent complexity, misperceptions, absence in medical curriculum, rigidity and unawareness of practicing clinicians and misinformation. The fundamental steps to bridge these barriers include effective teaching of skills of evidence-based medicine during residency, motivating the established clinicians, constraining malpractice, formulating locally applicable guidelines, increasing the accessibility to internet, availing telemedicine facility at peripheral centers and disseminating appropriate information via free journals or even newspapers. In association with strong political commitment, these steps can lay the foundation stone of evidence-based practice in SAARC region. Despite this gloomy picture, the overall economic growth of South Asian countries in the past decade and practice of evidence-based medicine in some tertiary care centers are a ray of hope.

INTRODUCTION

The South Asian region comprising of 8 countries, is diverse in geographical, linguistic and cultural characteristics but has common health challenges. It harbors one-quarter of World population but bears a triple burden of persisting infectious diseases, increasing chronic conditions and a growing rate of injuries and violence.[1] Evidence-based medicine (EBM) defined as "the process of systematically finding, appraising, and using contemporaneous research findings is the basis for clinical decisions". This concept was proposed by Gordon Guyatt at McMaster University in Canada in 1992.[2] Though the framework of EBM was laid in West, its basic essence seems to have existed in Asia long before its formal inception. South Asian countries and their societies are influenced by several faiths and religions like Hinduism, Islam, Jainism, Buddhism and Sikhism. These religions are variably scientific, logically defined and can be adaptable to change. It is difficult to believe that countries with such a rich cultural and ethnic heritage have not yet adapted the concept of EBM. Possibly, the problems with acceptance of EBM are not unique to EBM, rather reflect the overall poor socio-economic status of this region which itself is a major hindrance in health delivery.

SPECIAL RELEVANCE OF EVIDENCE-BASED MEDICINE TO ASIAN COUNTRIES

The southern region of Asia has one of the poorest health indicators in the world. It houses the largest number of people with micronutrient deficiencies and diabetes; carries 40% of the world's tuberculosis burden, has high burden of cardiovascular diseases and one of the worst indicators for reproductive health in the world.[3] Health systems across the region are characterized by limited resources, poor infrastructure, no national health insurance schemes and large burden of diseases.

Despite these sobering issues that affect over 1.5 billion people, South Asia spends far more in arms and weapons than on health and education.[4] In most parts of SAARC countries there is continuous conflict and upheaval. The long standing feuds between India and Pakistan, war in Afghanistan,

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Maoist uprising in Nepal and smoldering civil war in Sri Lanka have had huge impacts on the lives of people in the region.[4] In general, the financial commitment to health care in South Asia is low compared to other parts of the world, Maldives and Sri Lanka being exceptions. The people of South Asia have more similarities than differences and people in this region need to work together towards maintaining peace and channelizing the resources to improve the health of the region. Per capita health care access in almost all of South Asia is less than half to what a citizen of China has access.[5] Health spending as a share of GDP in South Asia is 4.4% as compared to developed countries where it ranges from 7.9%-9%.[6]

Unfortunately, in South Asia large number of people lives in poverty. According to World Bank, poverty is defined as living on less than $1.25 per day (at 2005 prices, adjusted to account for the most recent differences in purchasing power across countries) as minimum expenditure to meet the basic living needs. The percentage of poor in Bangladesh is 50.1%, Nepal 35.0%, India is 34.2%, Pakistan 31%, and Sri Lanka 22.7%.[7] Because of financial constraints people are forced to choose cheap medicine and often no treatment at all.

In South Asia, there is no centralized system for health care. Many qualified doctors work in private institutions or clinics where care is close to western standards but majority of population has to depend on sub optimal primitive or even no medical care. In many rural areas, there is no specialist treatment, except for service from occasional medical officer. People have to travel long distances by cattle drawn cart or public transport, so that even the sub optimal treatment is also delayed.[8]

In the present scenario, practicing rational medicine based on sound scientific evidence is of utmost importance especially in the developing countries where resources are scarce and pubic healthcare coverage is inadequate or nonexistent. In many developing countries physicians struggle to provide care on less than £7 per person each year.[9] These countries cannot waste resources on a single treatment that is not effective.[10] Equally important is the time and money that patients spend on their health care. EBM can be a solution for providing optimal health care with limited resources.

CURRENT STATUS OF EVIDENCE-BASED MEDICINE in SOUTH ASIA

South Asian countries are characterized by diversity not only in their culture but also in medical practice, ranging from large superspeciality hospitals with doctors trained in latest interventions to quacks who treat patient merely on experience or tradition. Unfortunately, these large and well equipped hospitals are able to cater to only small privileged fraction of the population and majority of patients are being treated by insufficiently trained or untrained practitioners.

Using a Pubmed search for term "Evidence based medicine", a total of 29,650 articles were found but only 102 articles were from South Asian countries. They were from India (75), Pakistan (16), Bangladesh (7), Nepal (4). None were from Sri Lanka, Afghanistan, Bhutan, or Maldives. This reflects scarcity of awareness about EBM in this region. A survey was conducted in India on the use of computer based electronic literature search as a surrogate marker for EBM.[11] Out of 194 respondents, 103 were from Post Graduate Institute with better infrastructure and training and 91 from Medical College. Computer based literature search was done at least once a month by 89%, motivation being presentation in a lecture or seminar (90%), research (65%) and patient management (60.3%). The benefit of search was acknowledged in learning and teaching (80%), research (65%) and patient care (64.4%). Formal training in computer based literature search was received by 41% responders.

Another survey was conducted among medical practitioners in Dhaka, Bangladesh to investigate the views, attitudes, and practice concerning EBM.[12] Out of 300 approached, 226 (75%) responded. Of the respondents, 118 (52%) owned a computer, 95 (42%) had never used email communication, and 111 (49%) had never accessed the internet. The most popular source of information about clinical evidence was textbooks (152; 73%) and review articles (134; 64%). Electronic resources, such as professional guidelines (24; 11%), the *Cochrane Library* (14; 6.8%), and hospital intranet protocols (11; 5.3%) were less popular sources of information. These data suggest that EBM has already been introduced in some regions of South Asia whereas at other places it is uncommonly practiced.

BARRIERS OF EVIDENCE-BASED MEDICINE IN SOUTH ASIA

The practice of EBM comprises 5 steps (Table 1), each being a complex and multi-step process which are difficult to resolve even by the most vehement protagonists of this "new paradigm".

Table 1: Steps involved in the practice of evidence-based medicine and problems encountered at each step

Steps	Problems
Step 1: Converting the need for information into an answerable questions	-Do not know where to start -Trouble in articulating a question -More questions than time
Step 2: Tracking down the best evidence with which to answer the question	-Where to find the best evidence? -Accessibility not only to computer but also database and computer knowledge -No relevant evidence available to every clinical situation encountered
Step 3: Critically appraising the evidence for its validity (closeness to truth), impact (size of effect), and applicability (usefulness in the clinical practice)	-Avalanche of published articles -Articles are inconsistent, inconclusive
Step 4: Integrating the critical appraisal with the clinical expertise and with the patient's unique biology, values and circumstances	-Universal occurrence of biological variation hampers attempts to extrapolate evidence, to individual patients
Step 5: Evaluating the effectiveness and efficiency in executing steps 1-4 and seeking ways to improve the next time	-No regular feed back or data collection system at most of the health centers

Constraints of most health care settings in South Asia allow the full cycle of this approach to a limited number of problems only. Most problems have to be solved at the intuitive end of the cognitive spectrum. Unquestionably EBM requires the acquisition and development of new skills (literature searching and critical appraisal) which are considered formidable by most practitioners.

Since the introduction of EBM, it has evoked both positive and negative reactions from academicians and clinicians. Like any other science, EBM has its own limitations (Table 2). Barring these limitations, many criticisms of EBM stem from misperceptions or misrepresentations which represent pseudo limitations of EBM.[13] It should be emphasized that EBM is not a power grab by academicians or a method of performing research but a method to use clinical research in a justified manner in the interest of patients.

Another important hurdle is the lack of consensus and clarity amongst clinicians about what EBM is. Even well intended supporters often do not know what the "E" in EBM stands for.[14] Although in recent years, there has been wide-spread inclusion of EBM into medicine training programs, it is still poorly integrated into the clinical teaching of trainees. In medical schools, the venues for teaching are journal club, ward rounds, grand round, out patient department, lectures and seminars. Journal club is an established means of medical education which increases familiarity with the latest medical literature, improves reading habits, promotes critical review of author's conclusions and promotes skill in clinical epidemiology. A study evaluating the pattern, motivation and facilities for choosing journal club topics by residents in two medical institutions (Post Graduate Institute and Medical College) in India revealed that topics were selected when considered good by residents or faculty rather than being case driven.[15] Despite better infrastructure and training, quality of journal club did not improve at the Post Graduate Institute. Patient's problems were not addressed through the journal club discussion.

Other difficulties encountered in teaching EBM include the following[16]: (1) EBM requires skills that are not traditionally part of medical training; (2) Cookbook medicine provides quick and easy answers, whereas critical appraisal involves additional time and effort; (3) Lack of high quality evidence for many clinical situations encountered; (4) Faculty members are skeptic about concepts

Table 2: Commonly cited limitations and misperceptions of evidence-based medicine[12]

Limitations
Universal to the practice of medicine
-Shortage of coherent, consistent scientific evidence
-Difficulties in applying evidence to the individual patients
-Barriers to the practice of high quality medicine
Unique to the practice of EBM
-The need to develop new skills
-Limited time and resources
-Paucity of evidence that EBM "works"
Misperceptions
-Denigrates clinical expertise
-Ignores patients values and preferences
-Promotes a cookbook approach to medicine
-Cost cutting tool or an ivory tower concept
-Limited to clinical research
-Leads to therapeutic nihilism in the absence of evidence from randomized trials

of EBM, hence unenthusiastic about modifying their teaching and practice in accordance with its suggestions; (5) Limited resources including poor infra-structure, insufficient computer terminals, restricted budget of most of the medical libraries so that access to authentic journals is often not possible.

Even if our Residency Program is successful in producing graduates who enter the world of clinical practice enthusiastic to apply what they have learned about EBM, they face difficult challenges upon completion of training as in the followings. *Economic constraints:* Patients are financially constrained and guideline based management cannot be always implemented. Intuition and previous experience of the treating clinician are widely practiced, which contradicts the emphasis in EBM. *Counter-productive incentives* may compete with the dictates of evidence as determinants of clinical decisions. Practitioners often depend on representatives of pharmaceutical companies for information. Commercial companies have much to gain from promoting drugs, whether or not they work. The situation is aggravated by the lack of effective policy regarding marketing approval for drugs.[9] In Pakistan, for example, the lack of any effective legislation means that authorities register about 5 new pharmaceutical products every day.[17] *Limited time and resources:* The doctor to population ratio in SAARC countries (40 per 100,000) is far below the global average of 170 per 100,000 population.[18] Even if a busy clinician recognizes and agrees with evidence-based practice, the literature applicable to the patient is not easily accessible and facilities for making literature searches may not be available at hand. *Legal issues* are another important consideration. Our judiciary may not agree with decisions based on EBM.

Lack of academic interest in clinicians further complicates the situation. In a study, most of the reading is done at the undergraduate level at 60 min per week; at post graduation, 10 min per week; and consultant level at 45min per week. Reading time is generally brief.[19] The basic essential of EBM is literature search which demands time devoted to reading, which is lacking in many of our practitioners.

Muir Gray captured the second essence of EBM when he proposed that it is about doing the right things right for the right people at the right time.[20] Each country differs in patient empowerment, information system, socio-economic status and individual disease prevalence. In a very real sense, all health care is local, including evidence-based health care.[21] However; most of the evidence-based guidelines are based on data from Western countries which might not be applicable in our setting. This is primarily because of paucity of good quality research in this region. Despite an enormous disease burden in South Asia, research is often viewed as expenditure rather than an investment.[1] It should be emphasized

that solutions to challenges faced by South Asia's health system need to be refined and tested within the region. For example, standard guidelines for antenatal care in many countries recommend up to 14 visits per pregnancy, although a trial in developing countries revealed that fewer visits had no adverse effects on pregnancy outcome.[22]

Physicians who have been in practice for a long period may become rigid and not up-to-date with current approaches to patient care. Even disseminating reviews and recommendations may fail to motivate such clinicians to abandon ineffective practices.

In South Asia, many other traditional forms of medicine like "Ayurveda", "Unani", "Homeopathic", "Siddha" are being practiced, particularly in rural India, where 70% of the Indian population lives. Many of these systems are based on experience, observations, empiricism, intuition and have been passed down generations both through word of mouth and treatises.[23] The risk benefit profiles of these alternative treatment has rarely been subjected to randomized controlled trials. It is a paradox that despite not being adequately studied, 80% of the Indian population depends on these therapies which are often not evidence-based.

POTENTIAL SOLUTIONS TO OVERCOME THE BARRIERS

Although the current picture is gloomy, the resilience of the South Asian people and their ability to find solutions to difficult problems raises some hope. The fundamental obstacle remains the willingness of governments and policy makers to give due importance to implementation and education of EBM.

Effective education is the most powerful tool for overcoming barriers to EBM. The clinical teacher should make it clear to learners on what basis decisions are being made. For instance, "Prospective studies suggest that Mr. XYZ's risk of a major vascular event in the first year after his infarct is 4%. A meta-analysis of randomized trials of aspirin in this situation suggests a risk reduction of 25%. It is necessary to treat 100 such patients to prevent one such event.[24] Given the minimal expense and toxicity of low-dose enteric-coated aspirin, treating Mr. XYZ is clearly warranted." Early introduction of EBM principles as a short course even to pre-clinical medical students is feasible and practical.[25] Introducing a short course on literature search and critical appraisal at the beginning of residency can provide the basic skills in EBM. A 2 weeks EBM rotation in residency program reported change in patient care among the residents as well as the faculty.[26] Attending physicians must be enthusiastic, effective role-models for the practice of EBM, even in high-pressure clinical settings such as ICUs. Literature search and critical appraisal skills should be integrated into clinical training. Conventional teaching and presentations should be replaced by case based journal clubs and seminars. Students can be provided incentives for learning EBM via scholarships or EBM based questions in the final assessment. Fellowships or diploma courses in EBM can be initiated at selected centers to increase awareness and application.

In India though some institutes are using computers for storing patient information, patient care and hospital management, actual computerization of health care is still in its infancy. The following are recommendations regarding resources to provide an environment encouraging the use of EBM in the delivery of quality and cost-efficient patient care[27]: (1) The system must be accessible round the clock whenever a clinical question is formulated; (2) The system must have many user stations available at strategic points within the hospital, if possible in the wards themselves; (3) The required reference must be available immediately if dealing with a question on patient care, and within forty-eight hours in all other circumstances; (4) Journal selection must be maximized and additional hospital funding should be provided to expand library resources; (5) If increasing the number of available journals is not feasible, then an effort must be made to ensure that interlibrary loans are very efficient; (6)The role of librarian as a team member in the EBM training process should be enhanced.[28]

The computer should become as indispensable as the stethoscope and prescription pad for practicing clinicians.[29] Even established and senior clinicians should be taught the basic skills of EBM via educational seminars. It should be emphasized that this is not to curtail their freedom but to add justification to their decisions. Educational seminars and conferences should be conducted and updated information should be conveyed in these meetings. To overcome the barrier of limited time among clinicians, systematic reviews (as by Cochrane collaboration) and critically appraised topics should be made available in "ready to use format". Finally, several questions can be generated for each patient and can slow clinicians by trying to address all of them. The question most important to the patient's well being

should be given priority.[13]

Legislation should be modified to constrain malpractice in the form of unnecessary prescriptions and investigations. In India, the inclusion of medical services under the Consumer Protection Act has increased the accountability of doctors and made patients more aware of their rights as consumers.

Local health guidelines should be formulated by authorities in respective fields which are feasible and applicable to people in their countries. High quality research should be conducted which can provide databases for these guidelines.

Various other measures like telemedicine facility should be made available at peripheral centers. This is an effective though under utilized mode of scientific communication. Practitioners at the peripheral centers where facility for literature search is not available can communicate with faculty in higher institutes who are well informed and can help provide solutions to their clinical problems. A website can be launched which can answer clinical queries of practitioners in consultation with various experts who are well aware with the methodology of EBM and guide the clinicians naïve to EBM in making quick decisions and delivering optimal health care. Journals publishing relevant reviews, updated guidelines and meta-analysis should be made free so that their accessibility is enhanced. If possible, latest guidelines can be disseminated via local scientific journals.

ROLE OF EVIDENCE-BASED MEDICINE IN NEUROLOGY

Neurology practice has its history deeply rooted as a rich descriptive discipline but has recently changed to have increasing diagnostic and therapeutic interventions. Evidence-based clinical practice thus becomes all the more relevant for neurologists. Since the inception of EBM, randomized control trials have curbed several practices in neurology which were not beneficial, and sometimes were harmful. Decisions in clinical neurology were heavily weighted based on the prevailing pathophysiological understanding. For example, ischemic stroke is commonly due to occlusion of the middle cerebral artery. Three decades ago, external carotid-internal carotid (EC–IC) bypass was commonly practiced based on the theoretical consideration of overcoming ischemia within the occluded vessel segment. A randomized trial revealed that the surgical procedure was no better, and sometimes even less effective than medical therapy.[30] After this evidence was published, the number of EC–IC bypass surgeries markedly declined. A large population based study evaluated the change in appropriateness of and indications for carotid endarterectomy following the publication of several large international randomized control trials designed to rationalize use of carotid endarterectomy. Among 9,588 patients, 87.1% of operations were done for appropriate reasons, 4.3% for uncertain reasons, and 8.6% for inappropriate reasons (vs. 32% inappropriate before the randomized control trials, $p < 0.0001$). It was concluded that the publication of the randomized control trials has led to reduction in inappropriate carotid endarterectomy.[31]

EBM not only helps with making therapeutic decisions but also adds quality to other components of clinical practice. For example a 43 year old previously healthy man experienced a witnessed grand mal seizure. He had no previous seizure and head injury. He drank alcohol once or twice a week and had no alcohol on the day of the seizure. Physical examination was normal. The patient was given loading dose of phenytoin intravenously and the drug was continued orally. A computed tomographic head scan was normal and an electroencephalogram showed nonspecific findings. The patient was very concerned about his risk of seizure recurrence. In the past, the attending physician, as taught by seniors, may have conveyed that the risk was high, though he could not give the exact risk. The patient may have been advised not to drive, to continue his medication, and to see his family physician for follow-up. The patient may leave the clinic in a state of vague trepidation of his risk of further seizures. In the current era, however, if the physician conducts a computerized literature search and critically evaluates the papers (evidence), he/she will find that the results are applicable to this patient. The entire process takes half an hour. The studies show that the patient's risk of recurrence at one year is between 30% and 43%, and at 3 years is between 51% and 60%. After a seizure-free period of 18 months, the risk of recurrence is under 20%. This information is conveyed to the patient, along with a recommendation that he takes his medication, see his family doctor regularly, and have a review of his need for medication if he remains seizure-free for 18 months. The patient leaves with a clear idea of his prognosis.[32]

Expertise and clinical experience are not to be neglected while practicing evidence-based neurology as without these even the first step

of asking relevant question cannot begin. A 28-year-old man is admitted to the intensive care unit with ascending paralysis and respiratory distress. The resident makes a diagnosis of Guillain-Barré syndrome and starts to discuss evidence-based approaches to treatment. The consultant comes, takes history and suspects dumb rabies. It becomes clear that the patient had a dog bite 3 months earlier and received only partial immunization. Further investigation confirmed the diagnosis of dumb rabies and the patient was shifted to Infectious Diseases Hospital for further treatment. This example illustrates the role of clinical expertise in practicing evidence-based neurology.[33]

FUTURE OF EVIDENCE-BASED MEDICINE IN SOUTH ASIA

At present it is difficult to guess about the future of EBM in South Asia. The hope lies in the fact that steps are already being taken to encourage evidence informed practices and these need to be augmented. In a study on computer based literature search in 2 medical institutes in India (Post Graduate Institute and Medical College), 20% of Post Graduate Institute and 66% of Medical College respondents made their literature search at their residence.[11] The inadequacy of infrastructure in Medical College did not seriously jeopardize literature search where 66% respondents did their search in cyber cafés (which need payment) and 65% at their residence. That the students are ready to spend time and money for literature search gives hope for better prospects of EBM in the country.

We can try to draw lessons from models of evidence-based health care delivery provided by the institutes like Sanjay Gandhi Post Graduate Institute of Medical Sciences, a tertiary care center in Lucknow, India. In the Institute, there are free internet facilities in wards, out patient departments, laboratory, library and the resident's room.[11,15] Websites such as MD consult, Science Direct, Proquest are subscribed in addition to large number of medical journals. Twenty-four hour's library service, brief curriculum of introduction to EBM at the beginning of every session and motivated teachers further assist in incorporating the basic skills of EBM among residents.

With increasing emphasis in EBM and recent socioeconomic growth of South Asian countries, there is hope of better medical care practice in the future.

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