Evidence-Based Medicine …… Or Is It?

“WE ARE DROWNING IN INFORMATION, BUT THIRSTING FOR KNOWLEDGE”

Let me preface this editorial by acknowledging that I do believe in evidence-based medicine (EBM), but with some personal reservations and perhaps bias. Although not nihilistic, it is hard to believe “All is right with EBM.”[1]

One of my colleagues forwarded a 2-year blog by Dr. Anish Koka, a cardiologist in the USA, titled “On defense of small data,”[2] which I have professed strongly to peer groups I am part of, and a follow-up blog by Dr. Michel Accad, an internist also from the USA, “The devolution of EBM.”[2] And listened to the podcast on their website on “Beyond EBM; Case-based reasoning and the integration of clinical knowledge” by Dr. Mark Tonelli, Professor of Medicine from the University of Washington—“one of the earliest, most thoughtful, and most articulate academic critics of the EBM dogma. Professor Tonelli was responding to the query – Can anyone question EBM and not be considered some kind of fringe lunatic?”[3] I do share some of the skepticism and cynicism they express, especially its relevance and transfer of these guidelines to most of the world which comprises low-to-middle income countries (LMICs).

This article is based on blogs, articles from non-peer reviewed and open access journals/opinions, and my own thoughts with all its prejudices and decrees. A purist of EBM might scoff at such an editorial in a “Specialty Journal.” This article is definitely not evidence based; these are my own reflections.

My inquisitorial of EBM began when I had to (a) look for evidence for endovascular procedures for critical limb ischemia (CLI) and (b) gather data about CLI from countries outside high income countries (HICs), to be a part of an international EBM document. These HICs, on either side of the Atlantic, are well-honed, equipped and funded, to conduct quality clinical trials in controlled environment, on a large numbers of patients from multiple centers. They do exemplary job and produce high quality data. These form the basis of EBM for the medical community of the entire world!

Let me address the category (b) first – broadening the heading to:

EBM AND LOW-TO-MIDDLE-INCOME COUNTRIES – IS IT RELEVANT AND TRANSFERABLE?

Gathering data from LMICs – the phrase “mission impossible” springs to one’s mind. We, in India, are fully aware that any vascular data – epidemiological, clinical and others – can be derived only from few centers, perhaps <50 for a population of over a billion! It would be a Herculean task, if it can be done at all, to collect similar data from other regions like Africa. The epidemiological data come from small pockets, diligently collected by select few physicians/healthcare workers. “In defense of small data,”[2] these perhaps represent the community/region/countries just akin to Gallup polls, where opinion sampling is fairly representative of events polled. However, such “small data” will not find its way into acclaimed peer-reviewed journals and guidelines because they do not meet their rigorous reporting standards (data are flawed because they do not take in to account the natural variability of any biological data) and this “knowledge” is not disseminated because they are not published; in fact, these “small data” are shunned. The paradoxical “Catch-22” situation; and the vicious cycle continues!

Even for diagnosis, treatments, and outcomes, these LMI countries rely on one’s clinical experience and acumen, not always depending on EBM – not because of lack of awareness, but because of other loco regional factors. To quote from above,[2] “I realize it has become dangerous to use one’s clinical experience to inform one’s views. While I have no quarrel with evidence, the reality is that the longer I practice, the more I realize that clinical scenarios rarely fit even the best designed clinical trials.” I do share this view and this is fairly true across LMICs.

The disparity in the social and economic status of populations within LMICs is considerable and the system of health care in these regions is a multi-tiered out of compulsion. The EBM has to be tailored to the individual needs, especially because of
economic constraints, and no EBM is created to cover this inequality – one size does not fit all! It is also true that “Important medical problems occurring in HICs can, depending on site-specific conditions, provoke much more severe challenges when occurring in low- and middle-income countries.” Some of these challenges are listed below (Chinnock et al.):

- Self-medication of “prescription” drugs or traditional treatments
- Late presentation and referral; lack of availability of specialists
- Poor facilities may delay diagnosis
- If a child, may be malnourished
- If a woman, may be anemic
- Will experience problems because of shortages of trained staff and because of poor infection control and because of a lack of follow-up care
- Patient may be unable (e.g., because of lack of funds, distance from medical facility) to fully adhere to treatment.

These are especially true of CLI, where an infected foot wound dominates and dictates the patient care.

Large randomized, multicentric, controlled studies conducted under ideal conditions, can rarely be applied to these groups of patients. However, it would be incorrect to state that EBM is not relevant or applicable in LMICs. To quote again from Chinnock et al. “If the case for the use of systematic reviews is good in developed countries – and we think it is – then the case is even stronger in the developing world. Wherever health care is provided and used, it is essential to know which interventions work, which do not work, and which are likely to be harmful. This is especially important in situations where health problems are severe and the scarcity of resources makes it vital that they are not wasted.” This statement is valid indeed, especially in countries like India, where we can provide care as per the decrees of EBM to wealthy. But for others, we need to modify these, which are unfortunately dictated by socio-economic status, with optimal use (and reuse) of resources without wastage.

There are several reasons why EBM is not routinely used in LMICs. “Evidence synthesis through systematic reviews or meta-analyses is often produced in HICs. However, these publications may not always be useful out of these settings. Firstly, access to medicines and interventions in LMICs are more limited than in HICs. There is insufficient public spending (lack of health insurance, out of pocket payments) and shortages due to problems in supply. Additionally, contextual differences can apply, such as cultural differences (barefoot walking leading to injury/CLI) and shortages due to problems in supply. Therefore, the implementation of clinical practice guidelines produced in HICs is not always a straightforward process in low and middle-income countries.”

But then how do we bridge this gap – “This type of work should be adapted from a collaborative approach, taking into account structural and organizational differences in specific regions.”

The trials from which EBM emerges rarely contain cost-benefit analysis. Naturally, the “Healthcare professionals in developing countries sometimes wonder whether their reliance on older, cheaper, ‘lower-tech’ approaches have made their practice quite distinct from that of their colleagues in richer regions. Yet the authors of systematic reviews seem, by and large, to prefer to take on the task of assessing the evidence for more recent (and generally more expensive) technologies.”

This is especially true in minimally invasive procedures, where ever-changing endovascular tools, pushed into the market and forced on to the healthcare provider by profit-seeking industries, drive up the costs! Those in LMICs rightfully wonder how “the magic tool” from yesterday has become redundant today because it employed a “lower technology.” The relevant evidence for this rapid change is hard to find.

The EBM and guidelines borne out of them are just that – GUIDELINES. They should not mandate “THAT” is the way to deliver care even in LMICs. Perhaps, these guidelines should be modified or suggest alternatives that can be practiced in LMICs; but it should be done by specialists in each region incorporating reasonable local evidence and data, however small they may be. It is hoped that the legal profession does not use some of the “undoable” EBM to pin a doctor down for not following these guidelines from HICs. Health policy makers should be aware of regional limitations in adapting EBM verbatim.

I conclude this section with this realistic statement, “When so-called developing countries first gained freedom from their colonial oppressors, Ernst Schumacher pointed out that there was a need, not for the “best” technology, but for “appropriate” technology. When it comes to healthcare, practitioners and patients of these countries need and deserve nothing less than the most “appropriate evidence.”

It would be apt to recall the clarified definition of EBM by Sackett in 1996, nearly a decade after Eddy introduced the term – “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients… (It) means integrating individual clinical expertise with the best available external clinical evidence from systematic
Suresh: Evidence based medicine ... Or is it

research…” Perhaps, we can integrate this with Confucian philosophy, “If you do not have the best, do the best with what you have.” This integration of past and present would work well for LMICs!

Let me track back to category (a) – look for evidence for endovascular procedures for CLI. Since most of the randomized controlled trials have acronyms, risking raised eyebrows and frowning foreheads, I will label this section as:

**Finding NEMO (New Evidence for Minimally invasive Operations)**

“It’s like a paradox: The more we insist on scientific reliability, the less certain our knowledge seems to become.”

Finding high-quality evidence to support endovascular procedures for CLI is like looking for a needle in a haystack or finding NEMO in the expanses of the ocean.

We, like the rest of the vascular world, are “sold” on minimally invasive endovascular procedures for CLI. The phrase “minimally invasive” also invokes a feeling in the minds of health care providers (not necessarily vascular surgeons) and the patients that it is less hazardous, and better, than its older, time-tested brethren – the “open” procedures. Does the EBM support NEMO? The answer would be clichéd Yes and No!

The “open” surgery in a variety of forms – thrombo-embolectomy, endarterectomy, “bypass” with vein/synthetic grafts and others – have had a run for over six decades, evolved through the hard work of skilful, innovative pioneers who reported single procedure and then more, results reproduced by numerous others – the way it should be. The tools were minimal – the vein at no cost; not so expensive and limited varieties of synthetic grafts, patches, and sutures which evolved, but not “improved” at a breakneck speed where we the users, the vascular surgeons, need to update ourselves almost on a daily basis with the “superiority of current product” as proclaimed by the industry! I am sure the “old timers” will remember the role of the industry before endovascular days– actually none to minimal! The data about “open” procedures are robust, widely reported, and well entrenched in our minds; and in prestigious books and journals. Since most of these were well before the arrival of EBM in the late 1980s and 1990s, they were not funneled through strong clinical trials requiring a huge number of patients in controlled situations in multiple centers. However, these have withstood the test of time and actually, the present EBM data clearly shows them to be superior to the much studied and reported NEMOs!

The recommendations for open procedures (of course retro-active grading since most were from before EBM era) constantly hover around 1 A and B. We have to be very indulgent to grade endovascular procedures somewhere in lower 2’s! It is perhaps good to recall “… big changes come from astute observations by little guys with small data sets. In times past, an alert clinician would make advances using his/her powers of observation, his/her five senses (as well as the common one) and most importantly, his/her clinical judgment. He/she would produce a case series of his experiences, and others could try to replicate the findings and judge for themselves.”

The progress of endovascular tools is intense; or rather “retooling” by industry is intense! Their change is so rapid that any evidence for their use is impossible to find. Industries, driven by profit motives, virtually change their “tools” every year; how are these tested? They say that the “new and improved version” is “bio-equivalent to the previous version, which was equivalent to the previous … so on;” we tamely accept this argument! Borrowing a quote from one of my distinguished colleagues from an international group—“the changes are so rapid, the challenges to keep findings relevance becomes even greater as the speed of technology development increases … vested interests, especially industry and not science, are increasingly driving the vascular practice around the world.”

The RCTs comparing endovascular to open procedures, for CLI, may be hard to come by in future because the heavy leaning towards minimally invasive procedures by vascular interventionalists, though the data to support this bias is slim.

If the above is true, why are we persevering with Endovascular procedures? Does it really have a role to play? The answer is a guarded YES! As technology progresses, though too rapidly, the patient-oriented outcomes are improving, closing the gap with open procedures. Our patient population is getting older, with multiple comorbidities; nearly all our patients present with foot infection/ cellulitis prohibiting the use of synthetic grafts, without venous conduit or with phlebitic veins. Endpoint is limb salvage, not necessarily long-term patency – establish the flow and heal the wound is the goal. Or are we trying to justify these procedures we perform?

The financial constraints and frequently less than ideal working conditions haunt many vascular surgeons in LMICs. Though HICs shun reuse of endovascular materials – we just cannot do without them. The so-called single-use devices (SUDs) – can somebody quote EBM against their reuse? I can’t find any. In fact in 2008 the Government Auditor General’s office in the USA published a document reporting that reuse of SUDs did not increase the patient risk. Also, one wonders who created the “expiry dates” for the stents – they are “permanent” when inside the human body subjected to varied physiological and biological stresses, but have an expiry date when inside a well-protected, sterile envelop! And all inventories, at times, are changed to accommodate “new and improved (?)” tools, when these hit the market, leading to wastage and increasing the costs! In LMICs, even the
“middle class” patients cannot afford to pay for all “new” materials. Without reuse of SUDs many will lose limbs and lives, just because they do not have adequate finances. Which is more ethical? Perhaps we should have a study comparing the outcomes of reused inventory and then we can create data for EBM.

Can any conclusions be drawn from the above about EBM? Yes, it is what we all know well. Need to be well aware of EBM and changing trends. Recalling David Sackett statement quoted earlier “The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. (It) means integrating individual clinical expertise with the best available external clinical evidence from systematic research….”

Since he did not have LMICs in mind, we need to build in our own variables to deliver individualized care to every patient. Until we bring out relevant EBM for LMI Countries, we must follow David Sacket’s dictum quoted twice above and provide the best care to our patients with what we have based on, but not dictated by, present EBM!

*There you have it, in my personal view – the Yin & Yang of EBM. Chinese Cosmology decrees this duality needs to coexist and are mutually beneficial!*

Post Script: Suggested reading, not referenced in this article:
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3. Cochrane A. L. (1972). *Effectiveness and Efficiency: Random Reflections on Health Services*. Nuffield Provincial Hospitals Trust.

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