THE ART OF EVIDENCE-BASED MEDICINE

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Forward
In May 1999, I presented a paper titled “Ethics and narrative in evidence-based medicine” at an International Conference on “Bioethics in the Third Millennium: Individual, Community and Society” held at the City University of Hong Kong. In the paper I reflected on certain ethical issues of the evidence-based medicine (EBM) movement. How secure are its underlying philosophical and methodological assumptions? What ethical problems may arise in its implementation? Subsequently I was asked to share some of these ideas with readers of the Journal of Hong Kong Geriatrics Society. Rather than repeating myself, I shall explore a somewhat different theme: the uneasy relationship between EBM and the art of medicine.

The universality and objectivity of EBM
The EBM methodology presumes objectivity and universality, as arguably all scientific truths presuppose the same. Objectivity implies that the entity being studied has objective physical existence, and that effects of interventions have objective regularity. Universality implies that the natural laws or regularities so discovered are universally valid and directly applicable in other space-time locale. Accordingly, in the science of EBM, subjective bias is methodologically controlled. When implementing EBM, variations of clinical practice from evidence-based guidelines are to be reduced. Good medical practice cannot be based upon idiosyncratic preferences of individual clinicians, and effective treatments must not have only subjective placebo effects.

The science of medicine has always valued highly the discovery of objective evidence. Scientific study of diseases as ‘objective entity’ can be traced to the Paris clinics in the 19th century. In the 1850’s special clinics were set up in France and England to study specific diseases patterns, leading to advances in diagnosis and clinical knowledge1. Evidence-based medicine is hardly a contemporary invention. What is new about the current movement of EBM, this ‘new engine of health care’ as it came to be called, is that it is powerfully computational2. Advances in computational science and statistical methods made possible efficient pooling of tremendous amount of data and information for meta-analysis. More and more, experts’ opinions are considered subjective, mathematics and numbers are objective and apparently free from bias.

The objective statistical language of EBM has largely displaced the older personal language in clinical reviews. ‘Meta-analysis of 25 RCTs searched by MEDLINE shows that treatment X is effective with a probability of Y’. Older jargons such as ‘clinical experience would suggests that...’, or ‘the recommendation by the consensus panel of the ZZZ Association is that...’, are mostly obsolete, no longer considered objective and trustworthy. Local descriptive reports and case reports are fast fading. Physicians do not seem to report many new clinical observations nowadays. Instead, standard statistical analysis is applied to routine clinical problems, to come up with formatted conclusions with standard probability tables or charts. In clinical meetings evidenced-based reviews are quoted with such a tone as to demand immediate implementation. Local context and particularity are conveniently ignored for being subjective or impossibly complicated. “Drug X is found to be effective for Alzheimer’s Disease in two RCTs”. The finding is expected to be immediately applicable to an individual case at the bedside, even though EBM is basically a methodology for populations (where statistical probability applies). Universality wins over particularity; the objective stands superior to the subjective.

The problem of reductionism
The celebrated universality and objectivity of EBM come at a cost. Clinical problems must be defined in heavily simplified terms to enable RCTs and pooled analysis. ‘Does stroke unit save lives?’ ‘Is TENS effective for chronic low back pain?’ The research questions are reductionistic, and may have ignored intricacy in real life practice.
Take stroke unit as an example. That stroke units can save lives and reduce disability is now (happily) evidence-based. An excellent treatment of the subject is contained in the recently published book *Stroke Units: an evidence based approach*. In the treatise, the authors faithfully apply EBM methodology to its full. There is a historical review of stroke unit development with EBM landmarks, definition of EBM terminology and review of its statistical methods. Clinical questions answerable by systematic reviews of evidence are outlined, and evidenced based conclusions are drawn. With this approach, stroke units are treated as if they were a homogeneous and objective entity. The authors frankly note that, whereas EBM methodology answers well such general question as ‘Do stroke units save lives?’ and ‘Do stroke units reduce dependency?’, how it actually work is a ‘black box’.

‘Black box’ may be an inevitable by-product of reductionist approach. To enable pooled statistical analysis, one must give up detail (possibly subjective) descriptions and observations of the dynamic care process within the microcosm of a stroke unit. Different stroke units, as one may expect, can be very different. If the differences are explored in detail, there is a real risk of identifying apples and oranges, peaches and apricots in the EBM fruit basket. Only by approximation and ignoring differences are pooled analyses possible. The ‘black box’ is constructed by the very methodology, descriptive information and practical insights would be considered subjective.

Clinical insight and knowledge at a working level are admittedly subjective. In EBM all evidence are evaluated with a well-known ladder of levels of superiority. At the top is meta-analysis and RCTs, at the bottom are descriptive studies and expert opinions. This hierarchy is constructed on a simple linear scale of objectivity. The more statistically it sounds, the higher is the ranking. The more descriptive and subjective the presentation, the lower the evidence is placed. Personal clinical insight has no legitimate place on this linear scale.

Reductionism is convenient in that complex entities are simplified as quantitative units that statistical methods can easily handle. It influences the way we practice medicine not only by offering us the evidence for reference, but also by constructing a generalising or universalising perspective. Patients with low back pain, for instance, are often routinely treated as if they were a homogeneous group. Evidence based reviews seek to answer questions such as ‘Is spinal manipulation effective for LBP?’, ‘Is TENS treatment effective?’ and so on. Low back pain is a syndrome, not a homogeneous physical disease entity (like myocardial infarction). It is more like depression. Lumping all subtypes to ask a general reductionistic question of ‘is it effective?’ may not be very helpful for individual patients. The uniformity of practice that is promoted may be too crude to be relevant to individual patient’s experience.

**EBM is not value-free**

EBM is promoted as an objective scientific methodology. It is rapidly institutionalised, with the Cochrane Collaboration and other international centres in the driver’s seat. Important systematic reviews are conducted and published. The Cochrane Collaboration is named after Archie Cochrane, who as early as 1972 posed a challenge to the medical community to establish a repository of clinical trials results for use by medical practitioners. Goodman suggests that the so-called “Cochrane’s challenge” was basically an ethical challenge: ‘Bad consequences follow from uninformed decision’. At the bottom are descriptive studies and expert opinions. This hierarchy is constructed on a simple linear scale of objectivity. The more statistically it sounds, the higher is the ranking. The more descriptive and subjective the presentation, the lower the evidence is placed. Personal clinical insight has no legitimate place on this linear scale.

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Even advocates of EBM are aware of the danger of thoughtless implementation of EBM findings in clinical practice. It may not be good practice, nor even ethical, to manage individual patients strictly according to protocol, without regard to the patient’s full clinical and social picture. Sackett has cautioned that ‘without clinical expertise, practice risks becoming tyrannised by evidence’, for even excellent external evidence may be inapplicable to or inappropriate for an individual patient. Without current best evidence, practice risks becoming rapidly out of date, to the detriment of patients.

Heterogeneity in medicine is a clinical reality, the real task to take a close look for explanations of variation, not to get rid of it. Another potential ethical problem with EBM is the systematic bias in the so ‘evidence-based purchasing’ of health care. Managers of health services often adopt EBM conclusions simplistically and uncritically. Dr Michael Wooldridge, an Australian health minister, has been quoted as stating that that ‘[we will] pay only for those operations, drugs and treatments that according to available evidence are proved to work’. EBM appears conveniently value-free to guide decision-making. But evidence-based purchasing is more complicated than what the advocates would like to have us believe. Marinker rightly noted that ‘evidence does not always point in the same direction, nor are the basic building blocks of clinical discourse quite as factual as planners might wish’.

A comprehensive text written for health care managers call for the development of an ‘evidence based organisation’, the culture of which is ‘an obsession with finding, appraising and using research-based knowledge in decision making’. The head of the organisation should be an ‘evidence-based chief executive’. A section of the book is simply titled ‘Evidence-based everything’. Such zealous belief in EBM may turn a valuable scientific paradigm into institutionalised superstition. Clinical practice, unfortunately, are easily swayed or persuaded by the tidal currents of resource allocation.

Systematic reviews are by nature retrospective, cross-sectional scans of currently available literature. It is subject to ‘cohort bias’- of which ‘publication bias’ (in favour of publishing positive results) is one manifestation. A cross-section search of ‘current literature’ is more likely to find acute interventions such as drug treatments (easy to evaluate by controlled trials) than long term studies of chronic illness. Diseases like multiple sclerosis with fluctuating clinical course do not have easy efficacy endpoints and are difficult to randomise or to control. In clinical research, potentially profitable new interventions are enthusiastically sponsored, whereas clinical problems affecting small minority groups are under-researched. Diseases of the economically underdeveloped countries may be ignored. Many clinical trials exclude patients of very old age and those with multiple co-morbid conditions. In real life it is precisely these patients who are most in need of health care. Purchasing policy exclusively focused on maximising population ‘health gain’ will discriminate against minority groups that do not fit into the ‘best buy’ shopping list.

Another ethical issue of EBM has to do with its claim of universality. Woo and Chan have cautioned against direct extrapolation of international findings to clinical care in Hong Kong. For instance, Chinese diabetic patients appear to respond to the ACEI anti-hypertensive drugs differently than Caucasians; and local studies found that elderly residing in residential care are as satisfied as in community, in contrast to international suggestions that community care is preferred. But even if the need for local research is recognised, it is hardly likely that many major research trials can be repeated locally. Even simple clinical questions may require large multi-centre trials over a long period of time. Available local evidence will thus never catch up with clinical questions. Automatic adoption of ‘international evidence’ in local practice, however, risks being irrelevant or inappropriate.

Clinical questions answered by EBM are often asked with specific kinds of answers in mind. Post-modern philosophers often ask a question from a ‘meta-’ position: “Who defines the question?” This is important in EBM. In a thoughtful example quoted by Hope, a systematic review provides strong evidence that prophylactic antibiotics reduce the frequency of infection following cesarean section, thereby recommending that all women should be given such prophylaxis. However, a patient representative looking through the data found that infection rates in different studies and different communities are very widely different. The apparent value-free rational recommendation of antibiotic prophylaxis has hidden another equally important problem of aseptic practice.

EBM, as scientific as it is as a methodology, is not therefore value-free. Paradoxically, the intricacy and complexity of the underlying ethical issues of EBM, rather than undermining its
fundamentally, may bring it actually closer to 'home' - to that human condition we call illness and healing.

**EBM and the art of medicine**

Kleinman suggests that objectification of the patient’s illness, at its extreme, is reductionistic, positivistic, and ultimately dehumanising. He notes that biomedicine seems to hold a peculiarly 'anxious strictness' towards non-mechanistic, non-materialistic, and subjective narrative of illness and therapy, even more so that other hard sciences such as modern physics (which has long abandoned purely mechanistic views of the universe). The culprit of objectification has been traced to the French rationalist philosopher Rene Descartes (1596-1650). It is argued that, with the Cartesian view of mind and matter divided, and the human body belonging to the objective, material world, diseases are studied and taught in medicine as if it were a separate entity from human experience. Such anxious strictness and obsession with the objective, even if justifiable from a scientific point of view, would hardly be therapeutic in its original healing sense — so the critics argue.

An obvious response to this line of criticism may be this: Modern medicine does pay serious attention to holistic care. Geriatricians and rehabilitation doctors can testify to the importance of comprehensive assessment. Psychosocial needs are addressed as far as resources and circumstances allow. The science of medicine is supplemented by the art of care.

But what possibly can the 'art of care' mean? It is interesting that as the science of medicine gets ever more powerful, the art of medicine is shrinking correspondingly in its scope. Nowadays, the art of medicine is generally understood as adjunct to scientific practice. It is expressed as psychosocial care. A social history complements the medical history, and a depression score completes the mental assessment. Psychosocial care is important - it restores a human face to the rushed doctor-patient relationship. Yet, the art of medicine may be more than psychosocial care. Plato (c.427-c.347 BC) insisted that 'medicine is an art, and attends to the nature and constitution of the patient, and has principles of action and reason, in each case'. Fundamental question remains. In the original meaning of the word ‘art’ is craft. The art of medicine is the craftsmanship of medicine. A craft is a hands on skill, knowledge acquired from practice (hence the term 'clinical practice'). The art of pottery is the knowledge acquired by innumerable close encounters with the material, the 'sense' and the 'feel'.

The paradigm of EBM does not in itself reject the 'art of medicine'. Nonetheless, the rigidly format and language of EBM does, to a large extent, discourage curiosity and improvisation - the very basis for any art form to grow or even thrive. Discovering and re-discovering, trial and errors, fine-tuning..... The art of medicine assumes experiential insight and, as Plato insisted, attention to the particularity of the patient, 'in each case'. Remember that in EBM, variations in practice are to be condemned. Universality and objectivity rule. It almost seems self-contradictory to coin such a term as the title of this paper - 'the art of evidence-based medicine'. EBM is stern faced, disciplined, regular. Art is fluid, organic, experiential, particularistic. ‘The art of evidence-based medicine’ may be an oxymoron, like calling someone ‘a clever fool’, or conceiving the shape of ‘round square’.

**Life after EBM**

What will happen to the art of medicine if the methodology of EBM eventually reigns the kingdom of health care in the next decade? Will a new democracy be born, where physicians can integrate sound scientific evidence with living experience from daily practice? Or will a totalitarian uniformity appear? Will the old art of medicine face extinction, surviving only through the desperate effort of a handful of conservationists? Or will it flourish with a new face? The history of medicine only goes down one particular path (of all possible paths). There will be no randomised trial to tell us what is the best path for the development of EBM, no controlled study to advise whether one path is better than another. At crossroads, we are ironically dependent on what we mistrust in the first place - that elusive ‘hunch’ based on historical and human insight into what is ‘probably’ sensible, and what not.

References:


**PERSONAL ASPIRATIONS ON GERIATRICS SPECIALITY DEVELOPMENT**

Geriatricians should KNOW and DO well the area of hospital practice that every physicians claim but only a few are seriously doing, i.e. NON-INVASIVE GENERAL MEDICINE IN THE ELDERLY. When sub-specialists are looking at the elderly patients from their respective narrow sub-speciality perspectives, geriatricians should take up the unique general position so as to take consideration of the board picture of health and multiple concurrent illnesses in individual elderly. With professional interest and expertise, geriatricians can provide streamlined and cost-effective medical care. We also should act as the medical agent to advocate the right of the elderly in today healthcare where elderly patients’ interest are often undermined by professional self-interests and misinformed cost considerations. There are like-minded internists who we should join hands with in the present healthcare reform.

The one central issue to be addressed relating to the future development of geriatrics as a medical speciality is how to balance the development of speciality knowledge with service need, i.e. growth of special geriatrics knowledge versus non-invasive general medical service requirement. These two aspects may be regarded as in conflict at times, but they can be considered also in balance or even as mutually promoting. One often forgotten yet strategically vital aspect of consideration is how geriatricains can advocate the development of general medicine in the elderly. Should hospital-based geriatricians make this the primary mission for both service and academic development of our specialty? Whether the answer to this question is yes or no, Hong Kong geriatricians still need to plan strategically and act. If not, our specialty may be de-hospitalized quickly in today competitive healthcare environment.

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