

## **Evidence Based Child Health: Fly but with Feet on the Ground!**

Evidence based medicine (EBM) is a favourite buzz-phrase these days. Medical conferences are incorporating sessions on EBM, scientific journals are including EBM related articles and medical professionals are happy to attend training in EBM. Although much has been spoken, written, explained, clarified, argued, debated and criticised about this subject, there still are considerable misconceptions and misunderstanding about the scope and role of evidence based medicine. We hope to address some of these issues and explore the rational use(s) of EBM in child health without duplicating excellent self-learning material that is readily accessible elsewhere(1-5). For want of a specific definition, the principles, processes and practice of evidence based medicine for the health and well-being of children are together recognised as ‘Evidence based child health’.

### **SCOPE OF EVIDENCE BASED MEDICINE**

There is no uniformly agreed upon definition of EBM and the scope has been defined differently by various experts(6-10). The multiplicity of definitions demonstrates two important points; first that the concept of EBM is undergoing refinement with time and second, its correct use depends upon integrating evidence with clinical expertise for the care of individual patients. A parallel may be drawn between EBM and the laboratory or radiological tests we advise everyday. A good clinician uses laboratory tests (and their results) to confirm (or rule out) what is suspected/expected based on knowledge and clinical judgment (expertise) in the circumstances of an individual patient. On the other hand there are many who order tests and/or take decisions on the basis of the results, without using clinical judgment. We need to understand that laboratory reports do not dictate what one should do, but provide information based on which a clinician may take a decision to do (or not to do) something. Clinicians with experience and expertise interpret

lab reports in terms of their context, validity, reliability and applicability, using these reports only as tools to guide decisions. This parallel holds good for the appropriate use of “evidence” also.

Professionals sometimes hope and expect that ‘evidence’ will answer their questions such as, “Should I use spacers in children with acute asthma?” To their chagrin, ‘evidence’ provides answers like, “*the length of hospital stay in the emergency department was significantly shorter, pulse rate was lower and peak flow and forced expiratory volume were similar, compared to nebulisers*”(11). This apparent difference is because evidence is geared to respond to a clinical question (with clear information on population, intervention, comparison and outcome), rather than a decision question. The ‘science’ of evidence based medicine hinges on the ‘art’ of turning decision questions into clinical questions! In short, evidence does not tell us what to do (or not to do), but provides information based on which decisions may (or not) be taken.

### **STRENGTHS AND LIMITATIONS OF EVIDENCE AND EVIDENCE BASED MEDICINE**

Judges in court ensure that the prosecution (and defence) spare no time, energy and expense to provide evidence (proof) that someone is guilty (or not guilty), before they decide to convict (or otherwise). This often appears unnecessary, even irrelevant to many people who “saw the person commit the crime” and/or “know that he did it”. However, the judicial process not only assures that innocent people are spared punishment, but more importantly documents the ‘evidence’ based on which decisions are taken. It also enables others to analyse and understand how the decisions were arrived at. This is the strength of the judicial system. Evidence based medicine works on similar principles.

In a criminal case, sometimes enough facts are not available to prove or disprove guilt. In such cases, the judge recognises that evidence is wanting but still has to take a decision (usually on the

principle of causing no harm) independent of personal opinion, bias or prejudice. Depending on the viewpoint, some hail this as a strength of the legal process, while others argue that it reflects a weakness in the system. Similar situations are often encountered in the realm of evidence based medicine also, where many systematic reviews conclude that enough evidence 'is not currently available'. Irrespective of whether this is regarded a strength or weakness of EBM, it cannot be used to reject the system altogether.

In some court cases, juries and judges themselves come to different (sometimes contrary) conclusions on the basis of the same set of facts (evidence) presented. This means that they interpret the 'evidence' differently, perhaps based on experience and expertise but (hopefully) not on personal whims. Even this apparent subjectivity does not argue against the validity and reliability of the legal system. In much the same manner, clinicians practising EBM have to judge the evidence critically and take informed decisions; although these may differ from decisions taken by others in the same or different settings. This independence must be recognised a strength rather than flaw of EBM.

It is interesting that sometimes different courts come to contrary conclusions in the same case. This happens either because additional facts appear that change the existing 'evidence' or the same facts are examined in a different way. In the context of EBM, this is a real possibility as new data becomes available and/or the same data is examined (analysed) differently. This has to be recognised and accepted as a part of practising medicine in general and evidence based medicine in particular.

In the legal process, it is not uncommon to observe that some lawyers fail to gather facts zealously (incomplete facts), some others fail to present the collected facts fully (half-truths) and yet others embellish the facts and present them in such a manner that the meaning and interpretation are altered (jugglery). These can result in flawed evidence and lead the entire decision making process astray. When this happens, the reputation of the legal system as a whole is dented, which is unfair and unfortunate. Similar situations exist in EBM as well when those who gather, analyse and present

evidence fail in their expected role. This results in criticism and condemnation of the principles, process and practice of EBM.

A possible limitation in (but not of) EBM is that the evidence relies heavily on data from well conducted randomized controlled trials (RCT), which is generally accepted as the experimental design that minimises bias if care is taken to ensure appropriate randomization, allocation concealment, blinding and consideration of drop-outs. Most RCT recruit participants based on strictly defined inclusion and exclusion criteria, administer interventions under highly controlled conditions, perform stringent follow-up and complex measurements of (often multiple) outcome measures with great precision, all at considerable cost in terms of time, energy and money. These steps often do not resemble real life practice where patients cannot be 'selected', interventions can neither be stringently controlled nor monitored and only inexpensive & uncomplicated outcomes can be measured. It is hoped that pragmatic RCT, a study design that is still emerging, will help to resolve some of these issues.

Approximately 85% of the evidence that is available has been generated in developed countries and is therefore focused on clinical conditions relevant to these populations and interventions that are applicable in such settings. In many cases, it is not possible to extrapolate this evidence for practical use in the setting of our country because of variations in the clinical condition (biological factors, late presentation, complications) and the intervention (availability, accessibility and affordability). Therefore, personal and professional judgment is required to resolve issues of generalizability (can the intervention be implemented in my setting?) and transferability (if the intervention is applied, will it result in similar effects?), that together determine applicability(12,13). Unfortunately, there is no scientifically proven method to address these issues.

#### **USING EVIDENCE IN CHILD HEALTH**

Accepting the strengths and limitations of EBM, professionals caring for children need to use evidence as a tool to support but not subjugate their decision making process. For this, evidence should be available, accessible and applicable in the setting

of individual patients and professionals. Evidence that can be used in practice should have the following characteristics:

*Relevance:* Clinical questions raised, interventions examined and outcomes measured should be relevant to the promotion and practice of child health in the Indian context.

*Validity:* Evidence should be reliable, which depends on the use of valid and reproducible methodology performed in a transparent manner. Systematic reviews on interventions presented in the Cochrane Library best fit this description.

*Extendibility:* Most systematic reviews present evidence without commenting on the important issues of applicability and transferability (briefly alluded to above). For want of a better term, we intend to use the term 'extendibility' to examine whether a particular piece of 'external' evidence can be 'extended' to the local context.

*Periodically updated:* The practice of evidence based medicine is a dynamic process. For this, evidence needs to be periodically updated to tailor practice accordingly.

*Critical appraisal:* Any scientific literature necessitates critical appraisal for drawing correct interpretations and conclusions; particularly where evidence is concerned.

*Understandable:* Many pieces of evidence are presented in strictly scientific language which is perceived as jargon to the uninitiated reader; therefore it is important to present evidence in an easy to understand format.

#### **EURECA—A STEP FORWARD**

Recognizing the need for promoting and practising the principles of evidence based medicine, the Indian Academy of Pediatrics (IAP) has been collaborating with the Royal College of Pediatrics and Child Health (RCPCH) and the Centre for Evidence Based Child Health, London. Under the dynamic leadership of Prof. HPS Sachdev, former IAP President and Chairperson of IAP EBM cell, a training program is being conducted for pediatricians in India, annually. The RCPCH journal, *Archives of Disease in Childhood* has

permitted *Indian Pediatrics* to reprint selected pieces from their *Archimedes* section, which regularly presents up to date evidence summaries on clinically relevant questions and attempts to provide evidence based solutions for these.

Starting with this issue, *Indian Pediatrics* is initiating a section dealing with evidence based child health that will include relevant pieces from *Archimedes* as well as original material. Based on the principles outlined above, we intend to use the acronym **EURECA** (Evidence that is Understandable, Relevant, Extendible, Current and Appraised critically) for the new section. This slightly tongue-in-cheek name owes acknowledgments to *Archimedes*, the Greek citizen who made the word eureka famous (apologies for the spelling) and *Archimedes*, the section in the *Archives of Disease in Childhood* (thanks for the concept). We intend to review these contributions and present them in EURECA, so that the wide readership of *Indian Pediatrics* is benefited.

#### **CONCLUSION**

Evidence has to be recognized as a tool that can strengthen clinical decision making, if used appropriately. As for almost all innovations in health care, the initial hype (and hope) surrounding EBM are being tempered with improved recognition of its strengths and limitations. In other words, health professionals could fly with it, but must keep their feet firmly on the ground! We hope that the new section EURECA will achieve just that.

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