Editorial

Evidence Based Medicine: Why should we be practicing it all the time?

Evidence Based Medicine (EBM) is best defined as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research.[1] The first real experiments with the practice of EBM date back to early 19th century in Paris.[2]

Currently, we are obliged to practice EBM and hence it is imperative that we understand what constitutes the evidence in EBM and how to gather and incorporate it in individual practice. In medical parlance, evidence means the proof that a given treatment works better than the earlier one or that the treatment cures the patient of his or her illness. It is essential to understand that the evidence in EBM is not absolute and has various levels. The Canadian Task Force defined the four levels of evidence as follows [Table 1]:[3]

While scanning a journal, one comes across terms such as randomized clinical trials, multi-center trials, systematic meta-analysis, case series, and case reports. These are all various levels of evidence. All types of evidence are important (in understanding and managing patients' problems) but not all evidences are equally important.

These levels of evidence are categorized according to the freedom from the biases which may creep into any medical research. At present, RCTs probably constitute the strongest evidence for the efficacy of a therapeutic modality. However, the results from one RCT may not be replicable by another researcher. The RCTs may not be needed in all cases, and they may be inappropriate or impractical. A meta-analysis of RCTs would logically give more robust evidence and would qualify as Level Ia evidence. A study which has a control group but is not randomized is likely to have greater bias and qualifies for Level IIa. One should recognize that expert knowledge still has some value attached to it, though a lower value than case–control studies or case series. The most logical approach is for the clinician to use the best available external evidence and combine this with his clinical expertise to decide on the best approach to the individual patient.

At the root of the EBM practice is the principle that the patient should get the best available treatment. The first step is to gather this "evidence" of EBM:

1. One may wish to consult his more experienced colleague/s and request for an expert opinion, but it has its limitations.
2. One can upload the problem on certain scientific web sites. Eg: All India Ophthalmological Society web site: www.aios.org[4]
3. One may attend continuing medical education programs or specific courses to gather the opinion of many experts.
4. One can search the literature or internet (PubMed, Medline, Embase, TRIP or Google) and get an answer.

Literature search is the best way of searching for evidence, as all the four levels of evidence can be collected and compared. However, there are some limitations, access to internet or libraries may not always be available and it is time consuming. The lack of initiative/interest and the deluge of information available on the net might lead to confusion. While searching the literature, one should be aware of appropriate key words to use for the search. The readers should never assume that the literature search is only for those writing papers in journal! It is important for any one involved with patient care as illustrated in the following example.

A diabetic patient who has been on regular follow-up for the past few years complains of reduced vision since few days. The vision has been recorded to have dropped by three lines due to cataract and the macula looks a bit abnormal.

Now the questions to ponder would be:

1. Is the macula normal or edematous?
2. Is the drop in vision due to diabetic macular edema alone or has cataract progressed enough to account for this?
3. What is the role of optical coherence tomography (OCT)?
4. Should grid laser be done for diabetic macular edema immediately?
5. Does grid laser work in all patients with diabetic macular edema?

Table 1: Levels of evidence

(Canadian Task Force on the Periodic Health Examination)	
Ia	Meta-analysis of randomized controlled trials (RCTs)
Ib	≥On RCT
IIa	≥One controlled, but not randomized trial
IIb	≥One good experimental trial
III	Comparison-, correlation-, case–control trials
IV	Expert knowledge

6. Does the patient need cataract operation besides laser therapy?
7. Does the diabetic retinopathy progress at all after cataract surgery even if the cataract surgery is an uncomplicated one?
8. Is grid laser followed by the cataract extraction the better option?
9. There are discussions about the use of intra-vitreal Bevacizumab for diabetic maculopathy at the time of cataract extraction. Is this a better approach?
10. Are there any other alternatives?

One can logically answer these questions with the help of various levels of evidence.

Q1. Macular thickness is reliably and easily assessed by OCT. If the macular thickness by OCT is more than 225 μm, there is definite macular edema. The various OCT machines have different normative databases (again EBM) illustrating the normal and abnormal macular thickness.

In this above example, assume that macular thickness was recorded as 375 μm confirming macular edema.

Q2. Your clinical expertise may help in diagnosing , but you may want confirmation. So one may choose to search in a book on OCT[5] or perform internet search. If you type the words: Macular edema and vision loss at www.google.com you get 234,000 results for the word macular edema and vision loss! Disconcerting! Addition of the word "meta-analysis" and "diabetic macular edema" will yield 10,300 results which is still a staggering number. Addition of OCT to the search results will lead to 7,960 articles containing these words. Google search is a very broadbased search and may not always provide reliable, useful and authentic information. Google and other search engines often show sponsored links which may be biased and unscientific and so it is important to consider the source of the information obtained when using a search engine like Google. It is probably better to do a search using TRIP databases (tripdatabase.com) or PubMed (http://www.ncbi.nlm.nih.gov/pubmed) which is a service of the US National Library of Medicine that includes over 19 million citations from Medline and other life science journals. Searching PubMed with the words: "Retinal thickness diabetic retinopathy vision loss" will reveal 57 articles. Addition of the word OCT will bring it down to 21 articles, an easily manageable number. It is easier to read 21-57 articles and select a reference article that gives the best answer. The study clearly states "OCT has now added another quantitative dimension in the assessment of diabetic macular edema and could lead to better visual outcomes via earlier detection and more targeted therapeutic approaches. Arguably, OCT is the single most important diagnostic and prognostic tool in the management of diabetic macular edema."[6]

Based on this information and the clinical evaluation of cataract, it is possible to decide on the relative contribution of the cataract and macular edema to the drop in vision. Once a decision has been made to proceed with cataract surgery, all the other questions from 3 to 10 need to be clearly answered. These answers can be obtained via literature search.

Does the diabetic macular edema progress after an uncomplicated cataract operation? A PubMed search reveals 54 articles some of which show that diabetic retinopathy progresses and the others say that it does not! How does one proceed now? A careful scrutiny of the articles will be necessary to isolate the RCTs and meta-analyses which obviously have a higher validity when compared with case reports and expert opinions.

A PubMed search will reveal that grid laser is ineffective in resolving diabetic macular edema in 20% of patients. Currently in the literature, there are many reports of short-term visual gain and resolution of diabetic macular edema in patients who received Bevacizumab injection at the same time as cataract operation. These are obviously case series and not RCTs. The use of intra-vitreal Bevacizumab at the conclusion of the cataract surgery to treat both cataract and diabetic macular edema is also evidence-based practice, but it is to be clearly understood that it is only Level 3 evidence. To fully establish the truth, RCTs and preferably multicenter trials are needed. These patients need grid laser treatment for diabetic retinopathy within 4 weeks of the intra-vitreal Bevacizumab injection as the effect of the injection is transient. It is important to understand that systemic control of the diabetes is equally important in these patients.

In conclusion, the practice of EBM is mandatory for everyone and though initially tedious, it significantly improves patient care. EBM practice is not just a research tool to publish papers but is essential to properly manage the patients at an individual level. All levels of evidence, though not equally important, are needed in clinical practice.

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