Evidence Based Periodontal Therapy- A Review
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ABSTRACT

With regard to dentistry, these are indeed the best of times. We have available materials and techniques that visionaries could only dream of 25 years ago. We can predictably replace missing teeth with implant-supported prosthesis, regenerate tissues lost to disease and trauma. Yet as our profession hurdles ahead these are also the worst of times. The new technologies are so enamoring that the collective common sense is lost.

This paper attempts to review the periodontal therapy and evidence based approach.

Key Words: Evidence based dentistry, Systematic Review, Meta analysis, Guided tissue regeneration (GTR), Open flap debridement (OFD).

Introduction
The concept of evidence-based medicine dates back to the time of Frederick II, Emperor of the Romans and King of Sicily and Jerusalem, who lived from 1192 to 1250 AD, and who was interested in the effect of exercise on the digestion, took 2 knights and gave them identical meals. One was then sent out hunting and the other ordered to bed. At the end of several hours he killed both and examined the contents of their alimentary canals; digestion had proceeded further in the stomach of the sleeping knight. [1]

EBD was borrowed from medicine. [2] Evidence based medicine has only been known for just over a decade and the term was coined by the clinical epidemiology group at McMaster University in Canada. One of the earliest to take up the challenge in periodontology was Alexia Antczak Bouckoms in Boston, USA. [3]

1980s: Bouckoms and colleagues challenged the methods and quality of periodontal clinical research.
1994: Oral Health Group as part of the Cochrane Collaboration set up
1996: World Workshop in Periodontology held by the American Academy of Periodontology included elements of evidence-based healthcare, supported by Michael Newman at UCLA.
1997: The editorial base of the Oral Health group subsequently moved to Manchester University with Bill Shaw and Helen Worthington as co-coordinating editors.
2001: The first Cochrane systematic review in periodontology was published and researched the effect of guided tissue regeneration for infrabony defects.
2002: European Workshop on Periodontology became the first international workshop to use rigorous systematic reviews to inform the consensus.

The PICO Process [5]
The formality of using PICO to frame the question forces the questioner to focus on what the patient/client believes is the most important problem and the desired outcome. It allows you to determine the type of evidence and information required to solve the problem and the outcome measures that will be used to determine the effectiveness of the intervention.

One of the greatest difficulties in developing each aspect of the PICO question is providing an adequate amount of information without being too detailed. Each component of the PICO question should be stated as a concise short phrase.

Applying the PICO Process
The first step in developing a well-built question is to identify the patient problem or population [P] by describing either the patient's chief complaint or by generalizing the patient's condition to a larger population.
Identifying the Intervention [I] is the second step in the PICO process. It is important to identify what you plan to do for that patient. This may include the use of a specific diagnostic test, treatment, adjunctive therapy, medication, or the recommendation to the patient to use a product or procedure. The intervention is the main consideration for that patient.

The third phase of the well-built question is the Comparison [C], which is the main alternative you are considering. It should be specific and limited to one alternative choice in order to facilitate an effective computerized search. The Comparison is the only optional component in the PICO question since oftentimes there may not be an alternative.

The final aspect of the PICO question is the outcome [O]. This specifies the result(s) of what you plan to accomplish, improve, or affect, and it should be measurable. Outcomes may consist of relieving or eliminating specific symptoms, improving or maintaining function, or enhancing esthetics. Outcomes yield better search results when defining them in specific terms. "More effective" is not acceptable unless it...
Critical appraisal of the quality of selected articles.
Extraction of outcome data from the selected articles.
Data combination (where appropriate) to synthesize and summarize the best evidence.
Report of findings relative to the knowledge base and new questions raised by the findings.

What To Look For In A Useful Systematic Review[7]
- Was a clinical question clearly stated and addressed?
- Were the search methods comprehensive enough to find all relevant articles?
- Were explicit methods used to evaluate which articles to include in the review?
- Was validity of the articles assessed, and was this assessment reliable and free from bias?
- Were inconsistencies in the findings of the included studies analyzed?
- Were the findings of the primary studies combined appropriately?
- Were the reviewers' conclusions supported by the data?

Different clinical research questions require evaluation through different study designs. Although RCTs and systematic reviews of RCTs may well be the ‘gold standard’ upon which to base the decisions on the effectiveness of interventions, they are not necessarily appropriate, or ethical to answer all the questions. For questions regarding prognosis or etiology, cohort studies would be more appropriate.

The emphasis on patient centered decision making has facilitated the focus on patient outcomes in particular, research design for questions of therapeutic effect, based on a clear understanding of the difference between effect, efficacy, effectiveness and efficiency.[8]

To offer patients the best treatment for their unique set of problems and preferences, the clinician must be able to do the following:[4]
- Have accurate historical, physical, behavioral information about the patient; perform a comprehensive periodontal, restorative, and occlusal examination on all patients.
- Find out about as many risk factors as possible and determine how they will modify treatment decisions and treatment response.
- Have access to the best and latest information about the patient’s problems and the treatment alternatives best suited to solve the problem.
- Have a system for evaluating the evidence and a method for incorporating a new technique in the practice.
- Having justification for choosing the end points of treatment and monitoring the patients’ status. These include both the physical endpoints such as probing pocket depths, and patient centered end points such as preferences.

![Table/Fig 4: The influence of risk factors on the anatomic changes that in turn determine the clinical status of the patient.][8]

Routes of evidence [9]
- Asking someone.
- Consulting a textbook.
- Finding relevant article in our own reprint file.

Using bibliographical database such as medline

Advantages [9]
It does not take clinical decisions out of the clinician’s hands and put them into the hands of literature. EBD gives guidelines for the clinician and relies first on clinical expertise. It relies on evidence rather than authority for clinical decision-making.

It uses resources more effectively. The clinical problem solving approach to dentistry favours the early uptake of new and better treatments. Systematic reviews in the form of overviews or meta-analyses offer a solution for busy practitioners who have difficulty keeping abreast of current literature. Because systematic reviews can condense numerous studies into reliable and valid summaries of the best available evidence for a specific clinical problem, they offer significant benefit to busy clinicians.

Systematic reviews are now considered the most reliable method for summarizing large volumes of research evidence. These reviews are less prone to subconscious and subjective forms of bias often seen in reports by experts because they follow
principles of research design similar to those found in primary research.

Disadvantages:

- Amount of evidence
- Quality of evidence
- Dissemination of evidence
- Practice based on authority rather than evidence

Information in an article about the prognosis of a condition should be applied to a special patient can be decided by the following questions:[10]

- Will the results lead directly to selecting or avoiding treatment for an individual patient?
- Are the results useful for reassuring or counseling patient?

Example with the clarification of the prognosis of juvenile periodontitis treatment can be more focused and aggressive.

Certain questions specific to article about therapy will help determine when to apply improvements to patients and when not to:

- Are the results reported as outcomes that are important to patients?
- Were all clinically important outcomes reported?
- Are the likely treatment benefits worth the potential harms & costs?

For example a Meta analysis presented recently suggested that GTR procedures would result in a mean increase in attachment level of 4.0mm. The result is impressive but the application of this information to an individual patient requires that an increase in attachment level predicts greater tooth longevity- an outcome more likely to be of interest to the patient than the level of attachment.

[10]

Conclusion

A major push to integrate the principles of the evidence-based approach into the mainstream of clinical practice has come from the fact that there is great variation in both clinical decision-making and results of therapy.

Evidence based approach conducts systematic appraisal of quality evidence, is more objective, transparent and less biased. It allows greater acceptance of levels of uncertainty.
The traditional approach however has unclear basis of evidence, unclear or absent appraisal or quality evidence, is more subjective, more opaque and more biased. It has greater tendency to black and white conclusions.

Despite the cited differences both the evidence-based and traditional approach emphasize on high value of clinical skills, experience and integrating evidence with patient values. Research evidence helps to decide which interventions are most effective. It should not replace our clinical findings from history and examination, but harness our clinical intuition from years of experience and help us recognizing gaps and uncertainties in our knowledge.
