

ENHANCING EVIDENCE BASED DENTISTRY PRACTICE AT BPKIHS

*Singh SK, MDS **Singh RK, MDS *** SS Hiremath, MDS **** Singh S, BDS

ABSTRACT

Evidence – based dentistry is part of the initiative referred to as evidence- based health care that includes EBM and EBN.

Evidence based dentistry is the conscientious, explicit and judicious use of current best evidence in making decision about the care of individual patients. The practice of EBD means integrating individual clinical expertise with the best available clinical evidence from systematic clinical research.

“In practice this would help individual clinicians to judiciously adopt treatment strategies and purchase material that have the best clinical effects for their patients. Patients will also not be wrongly advised by their dentists to undergo a line of treatment that may not be the most appropriate to their need.”

Meta analysis was performed on the dental literature since 1970, presenting clinical data of conventional bridges.

42 publications were found. They dealt with 33 different samples. The data of 4118 conventional bridges were analyzed. The calculated overall survival rate was $74 \pm 1\%$ after 15 years.

Evidence based dentistry is not a threat to clinical freedom since it is not supposed to replace individual expertise, experience and judgment; but instead meant to complement the above.

Key words – EBD –Evidence based dentistry, Meta analysis, Cohort study, Randomized trials, Clinical trials, Fixed partial denture, Removable partial denture, Cantilever bridge, Resin bonded prosthesis. EBM Evidence based medicine, EBN- Evidence based Nursing

DEFINITION

“Evidence based dentistry is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patients¹.”

It is a process of systematically reviewing, appraising and using clinical research findings to aid the delivery of optimum clinical care to patients. EBD forms part of the multi faceted process of assuring clinical effectiveness, the elements which are production of evidence through systematic research and scientific reviews².

PRODUCTION AND DISSEMINATION OF EVIDENCE-BASED CLINICAL GUIDELINES.

Implementation of evidence based–effective practice through education and management of change.

Evaluation of compliance with agreed practice guidance and patient outcomes. This process includes clinical audits.

LEVELS OF EVIDENCE

Evidence is presented in many forms, and it is important to understand the basis on which it is

* Dr. S. K. Singh, M.D.S. Assistant Professor, Dept. of Prosthodontics, ** Dr. R. K. Singh, M.D.S. Professor and Head, Dept. of Prosthodontics, *** Dr. S. S. Hiremath M.D.S. Associate Professor & Head, Dept. of Pedodontics, **** Dr. Smita Singh B.D.S. Dental Surgeon, College of Dental Surgery, BPKIHS, Dharan, Nepal.

stated. The value of evidence can be ranked according to the following classification in descending order of credibility:

1. Strong evidence from at least one systematic review of multiple well designed randomized controlled trials.
2. Strong evidence from at least one properly designed randomized controlled trials of appropriate size.
3. Evidence from well designed trials such as non-randomized trials; cohort studies time series or matched case-controlled studies.
4. Evidence from well designed non-experimental studies from more than one center or research group.
5. Opinion of respected authorities, based on clinical evidence, descriptive studies or reports of expert committees.

WHY IS THERE A NEED TO PRACTICE EBD

"In practice this would help individual clinicians to judiciously adopt treatment strategies and purchase materials that have the best clinical effects for their patients. Patients will also not be wrongly advised by their dentists to undergo a line of treatment that may not be the most appropriate to their need."

Well-designed clinical trials provide the most robust evidence for therapies provided to patients. This allows for faster acceptance for a good treatment and the rejection of a bad one in practice. The use of systematic reviews in particular, can shorten the time between medical research discoveries & the implementation of effective diagnostic or treatment strategies. In practice, this would help individual clinicians to judiciously

adopt treatment strategies and purchase materials that have the best clinical effects for their patients. Patients will also not be wrongly advised by their dentists to undergo a line of treatment that may not be the most appropriate to their need.

Evidence based dentistry allows the young dentist to quickly acquire & to keep up-to-date in later years, a wealth of knowledge than otherwise may only be acquired as part of clinical experience. Furthermore, knowledge thus acquired is less prone to errors, as compared to unsystematic observations derived from clinical experience that may overestimate efficacy. This is because favorable treatments tend to be more likely to be recognized & remembered by clinicians when their patients comply with treatment and follow up. Therefore good compliance may be a marker for better outcomes even if the treatment had been useless. They move away to make more informed decisions regarding treatment options.

Skills acquired practicing EBD enable dentists to constantly monitor & audit themselves and thus develop their clinical performances further.

- Dentists can provide proper documentation during lawsuit.
- The true professionals stand out from the plethora of "alternative practitioners".
- Help during final scrutiny by the government or insurance companies.
- Government agencies and insurance companies demand more for their money.

STRATEGIES FOR EVIDENCE BASED DENTISTRY

- Address of clearly defined questions
- Application of specific research strategies
- Detailed preparation of results
- Application of results to the patient care

STEPS IN A SYSTEMATIC REVIEW OF SCIENTIFIC EVIDENCE

Steps

- Research questions

Comments

Focused and clinically relevant

Methods

- Data sources

Published and unpublished studies. Secondary data analysis

- Study selection

Inclusion and exclusion criteria

- Outcome measures

Relevant to the clinical questions

- Data extraction

Protocol for summarizing the information from the studies

- Sub group comparison

Are there any difference between different groups of patients

- Statistical analysis

Quantitative methods: Meta analysis

- Quality control

Methods to ensure that Biases are controlled

- Peer review

Process to incorporation of the comments from the reviews included studies and excluded studies

Results:

- Evidence tables

- Secondary analysis

- Meta analysis

Conclusions

Limitations and summaries

Future research

Questions that is still unanswerable.

Systematic reviews will

- Assist in selecting effective and scientifically validated treatment.
- Provide information on the success/failure of treatment for given patients characteristics.
- Caution about the procedures that have not been scientifically evaluated and will help dentist to communicate limitations of treatment.

EBD AND QUALITY OF HEALTH CARE

U.S. Health Care Financing Administration (HCFA) defines good health care as:-

Doing the right thing, at the right time, the right way, for the right people –and the getting the best possible results.

Components of good quality health care

1. Provision of effective interventions
2. At the right time
3. The right way
4. For the right patient
5. Getting the best possible results

Tools for quality health care

- Scientific reviews
- Patient preferences and professional expertise
- Technical skills and expertise
- Decision making principles and systematic reviews
- Patient preferences and outcome assessment

Types of scientific publications and their potential impact on clinical practice

Randomized clinical trials:-

Provides the strongest evidences if eliminating or controlling the effects of multiple variables is adhered³ to

- Randomization is done
- Control group
- Double blind study

Meta analysis: -

Meta analysis is the retrospective systemic identification, appraisal and comparison of all clinical trials relevant to a selected topic of interest using statistical methods to combine and summarize results from the related studies⁴.

The overall result represents a weighted average of results of the individual studies. Provides one of the strongest evidences.

Review articles: -

Consists of a summary of two or more scientific papers on a specific topic. Although the quality of these articles may vary due to the bias of the authors, review articles often provide an excellent source of information on a particular topic.

Retrospective and Prospective longitudinal (cohort) studies:-

Follows a group of patients over a period of time

Prospective:

Used to follow patterns of disease activity in groups of patients as their age as well as examining the clinical performances of medication, surgical procedures, medical and dental devices over a specific period of time.

Cross sectional studies:-

- Examines one /several phenomena at only one patient in time.

- Less compelling evidence than that of either randomized clinical trials or longitudinal studies.

CASE STUDIES

Quite common and typically present a new procedure, technique/clinical result which may be unusual. They are usually observational in nature and provide less compelling evidence, since they typically lack control groups and are of inadequate sample size.

OPINION PAPERS

Represents the views of one or more authors on a particular topic. These views may /may not be based on scientific facts⁵.

Evidence based dentistry and dental education

Tedesco⁶ suggested that dental education still strives to teach students to do mechanical dentistry the right way.

The translation of biological knowledge into clinical training is weak and evaluation studies of outcomes of dental treatment have not yet been widely carried out⁷.

EBD and dental education will work best in schools that have a broad definition of scholarly activity where research represents more than conducting basic sciences studies.

The practice of EBD is a process of lifelong, self-directed learning in which caring for our own patients creates the need for clinically important information about diagnosis, therapy & other clinical & health related issues.

“EBD as a vision for dental education opens a new path for clinical dental faculty, which integrates research into clinical teaching & practice”.

The essence of dental education should be the development of lifelong learning skills in dental students to do mechanical dentistry the right way.

Dental curricula have two distinct sets of course-basic sciences and clinical courses. The translation of biological knowledge about oral health into clinical training is weak.

“Thus EBD should not be viewed as a threat but should be embraced, for if used appropriately will improve patient management”.

EBD as a vision for dental education opens a new path for clinical dental faculty, which integrates research into clinical teaching & practice. It is a path that permits clinical faculty to become engaged into clinical research or, most importantly, dissemination and translation of findings from clinical research into education and practice.

EBD, Ethics and Professionalism

The Dental profession has adopted normative principles of bioethics in its code of ethics⁸:

Autonomy – valid and tested on healthcare decisions.
Justice – patients are informed of or lack of evidence.

Potential Abuses of Evidence – Based

Jokstad-A, 1998, started that, EBD is much more than randomized controlled trials and must always be regarded as an adjunct to, and not as a substitute for, sound clinical judgment and patient Preferences⁹.

- Insurance companies that pay for any portion of a treatment will use “evidence” to determine which procedures they pay for and which procedures they will not cover. They will dictate what technique and treatment will be acceptable. It will eliminate the concept of professional judgment and the desires of the patient.
- With a view of cost containment, the ownership and the validity of the “evidence” becomes very important.
- The dental schools all under great pressure from their parent institution to justify their existence academically and financially and

will leave them vulnerable to the influences that fund research⁹.

- Lawrence and Richards¹⁰ 1998, stated that a “research alliance” between a dental school and a foundation to bring-forth “evidence” may question the validity of the research outcome.

Evidence based practice in replacement of missing teeth

For replacement of missing teeth we have various Prosthodontic option available are

- Removable partial denture
- Fixed partial denture
- Cantilever fixed partial denture
- Resin bonded fixed partial denture
- Implant retained fixed partial denture

Fixed partial denture is the most widely accepted option for replacement of missing teeth. McCracken² said, “at the risk of over simplification, I believe a rule may be stated to the effect that the replacement of missing teeth by fixed restorations always should be the method of preference”. Unless a fixed bridge restoration is contraindicated for some reason one cannot justify removable partial denture restoration for arbitrary reason alone.

CANTILEVER FPD

Long-term prognosis is poor¹¹

Cantilever design may be preferred since re-adhesion after failure is greatly facilitated and often leads to predictable long-term success¹².

An analysis of clinical studies on resin bonded bridges (sixty publications) were done

since 1966. Out of that sixteen are included in the study¹³.

Review articles suggests that, survival rates:

1year	89±1 %
2years	84±1%
3years	80±1%
4years	74±1%

Meta analysis of durability data on conventional fixed partial denture.

Meta analysis was performed on the dental literature since 1970, presenting clinical data of conventional bridges.

42 publications were found. They dealt with 33 different samples According to the exclusion criteria 26 studies were excluded. The data of 4118 conventional bridges were analyzed. The calculated overall survival rate was 74±2.1percent after 15years¹⁴.

Data shows variables as a result of the difference in patient selection, clinical procedures. Variations in the presentation of results are responsible for the inconsistency in data only study published in German, Dutch, and English were used. Inclusion and exclusion criteria's were

- Minimal follow up period of 5 years
- Publication should provide information about the patients and selection procedure of patients.
- Sufficient information about the design of the bridges.
- Publication should present survival data or contain relevant information to calculate / access survival data including confidence levels.

CONCLUSION

Evidence based dentistry is not a treat to clinical freedom since it is not supposed to replace individual expertise, experience and judgment; but instead meant to complement the above. Clinical expertise and the dentist's understanding of patient needs will help decide what external evidence best applies to the individual patient. Without clinical expertise, practice risks being randomized evidence; and without current best evidence, practice risks becoming rapidly out of date.

Thus EBD should not be viewed as a threat but should be embraced, appropriately and thus it will improve patient management and teaching learning activity as well.

REFERENCES

1. **Sackett DL, Rosenberg W, Gray MJ, Haynes BR, Richardson WSJ:** *J Am. Dent. Assoc:* 1996; 6; 205-9.
2. **McCracken WL:** Differential diagnosis: Fixed or Removable partial dentures: *J Am. Dent Assoc:* 1961; 65; 767-75.
3. **Eddy, Rosenberg W, Sackett DL:** *J Am. Dent Assoc:* 1993; 3; 16-19.
4. **Abet E:** Evidence based dentistry: An overview of a new approach to dental practice. *Gen Dent:* 1999; 47; 369-73.
5. **Palmer AJ, Sendi PP.:** *Comm Dent Oral Epidem:* 1998; 49-61.
6. **Tedesco:** *J Dent Edu:* 1995; 5; 16-18.
8. **Kenny:** *J Am Coll Dent:* 1999; 369-373.
9. **Jokstad A:** *J Evid Based Dent:* 1998.
10. **Lawrence, Richards:** Evidence Based Dentistry: 1998.
11. **Cheung:** *J Ooral Rehab:* 1990; 14; 45-49.
12. **Briggs P:** *Br Dent J:* 1996; 9; 5-9.
13. **Creuger, Hoff:** *J Dent Res:* 1991; 8; 12-16.
14. **Creuger, Kayser, Martin:** *Comm Dent Oral Epidem:* 1994; 9; 33-36.