

EVIDENCE BASED MEDICINE: AN OVERVIEW

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يعتبر الطب المبني على البرهان إحد أهم التطورات التي طرأت على الممارسة الطبية في السنوات الحديثة الماضية، ونشأ هذا الطب كأحدى الأدوات التي تستخدم لتحسين جودة الرعاية الصحية. وقد أظهرت العديد من الدراسات أن الطب المبني على البرهان آمن وذو جدوى اقتصادية. ورحب الأطباء الممارسين بهذا التطور الطبي وأظهروا تجاوباً معه وعبروا عن رغبتهم في التعرف على هذا التطور بصورة أكبر. وكان هناك اتفاق على هذه الثوابت بين معظم الدراسات التي عملت في كثير من البلدان. وكانت أهم العقبات التي تواجه التطبيق الأمثل لهذا التوجه هو عدم كفاية الوقت والبرهان، ورغبة المريض، ومحدودية الموارد. ويعتبر التدريب عاملاً مساعداً في تطبيق وتطوير الطب المبني على البرهان. ويطبق الآن بعض البلدان العربية الطب المبني على البرهان ومن المخطط تضمين الطب المبني على البرهان في المناهج الدراسية لطلبة الطب. وتم البدء في تطبيق الطب المبني على البرهان في المملكة العربية السعودية في نهاية التسعينات وذلك من خلال تشكيل الهيئة الاستشارية الوطنية للطب المبني على البرهان.

الكلمات المرجعية: الطب المبني على البرهان، الأطباء، الممارسات، المعوقات.

Evidence based medicine (EBM) considered one of the most important developments in the practice of medicine in recent years, has evolved as a tool for improving the quality of health care. Several studies have shown EBM to be safe and cost-effective. Physicians have welcomed EBM and shown a positive attitude toward it and have expressed desire to learn more about it. This is consistent in most studies done in different countries. However, some studies found considerable misunderstanding about terms and websites used in EBM. The major barriers to the practice of EBM perceived by physician in different studies include insufficient time and evidence, patients' preference and financial constraints. Training has been found to be conducive to the implementation and promotion of EBM. Some Arab countries are already implementing EBM and plan to include it in the undergraduate curriculum. In Saudi Arabia EBM was introduced in the late 90's and a National EBM Advisory Board was formed.

Key Words: Evidence based medicine, Physician, Practice, Attitude, Barriers.

Evidence based medicine (EBM) has evolved as a promising tool for the improvement of health care. David L Sackett, (contemporary founder of

evidence-based medicine) and his colleagues defined EBM as "the conscientious, explicit and judicious use of current best evidence in making decisions

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about the care of individual patients. They said further that practising EBM aims at integrating individual clinical expertise with the best available external clinical evidence from systemic research and patient values.¹

EBM has been considered one of the most important developments in medical practice in recent years. As a new concept, little is known about its background, concept, and implementation. This overview will be a literature review on the history of EBM, its practice and implementation by health staff, mainly physicians, at the global, regional and local levels.

Different bibliographic sources: books, Medline and retrieval of information from the internet, as well as direct and e-mail communications with authors are in the literature review. Priority has been given to reviewing local and regional literature, though unfortunately, not much has been found.

HISTORICAL REVIEW

EBM is the product of a long tradition of the medical model and rationale in medicine. It first appeared in medical literature in 1991, when it was proposed by a group of academic physicians as a new way of teaching the practice of medicine.² It was based on the belief that a paradigm shift was occurring, from "intuition, unsystematic clinical experience and pathophysiological rationale" to an emphasis on evidence collected from research. This core group tried to demonstrate that medical decisions should be based on distillation of the best evidence obtained from research as well as the physician's clinical experience. The new approach was consolidated and named EBM in 1992 by a group led by Gordon Guyatt from the Department of Clinical Epidemiology and biostatistics at McMaster University in Ontario, Canada¹. The origin of EBM, however, can be traced back to the late 1980s³ or even earlier when in 1970 a

committee of physicians and administrators tried to evaluate literature to understand how health professionals learn and keep up-to-date after they graduate.⁴

Bella asserted in an editorial that EBM is not a new discovery.⁵ He traced the origins of the concept to the 9th Century when the famous Muslim physician Rhazes (865-915 AD) made a clear statement embracing the concept of EBM. It read "What has become physicians' consensus, based on analogy and supported by research experiments, should be your guide" (ما أجمع عليه الأطباء و شهد عليه القياس و عضدته التجربة فليكن إمامك). Bella also stated that many Muslim physicians after Rhazes made clearer statements relevant to the concept of EBM.

Eighteenth century Britain witnessed the proliferation of learned societies and journals for the dissemination of ideas, encouraging decent and honest analysis of the successes and failure of medicine. Ulrich Trohler, a distinguished Swiss physician and medical historian, mentioned that EBM could be traced back to British origins in the 18th century. Publications in the 18th century calling for a more critical evidence-based approach to medicine included an "attempt to improve the evidence of medicine" by George Fordyce in 1783, "the improvement of Medicine in London" (1775) by John Lettsom, John Gregory's "observations on the Duties and Offices of a physician" (1770), and John Aikin's "Thoughts on Hospital" (1771).⁶ However, Sackett, a contemporary pioneer in EBM, stated that the philosophical origins of EBM date back to the mid-19th century in Paris, when clinicians like Pierre Louis (1834) rejected the pronouncements of authorities and sought the truth in systematic observation of patients.¹

AWARENESS AND ATTITUDE TOWARDS EBM

McColl et al conducted a questionnaire

survey in 1998 for general practitioners (GPs) in Wessex in England, the aim of which was to determine the attitude of GPs towards EBM and their related needs.⁷ Respondents welcomed EBM and agreed that its practice would improve patient care. They had little awareness about journal extraction, review of publications, and databases (40% of the physicians knew the Cochrane Database of Systematic Reviews). Even among those who were aware, many did not use them. Most had some understanding of the technical terms used in EBM, and one third of them felt able to explain to others the meaning of some of these terms. However, this was a self-administered questionnaire. The need was to assess real practice, as there was the potential of self-reporting bias.^{8,9}

Hagdrup et al criticized the McColl study because only physicians were included in the sample, not all members of the health team. In view of this, they distributed the questionnaires to the other health team members.¹⁰ It revealed that the members of the primary health care team were aware of the importance of EBM in the daily management of patients' problems in East London.

Coleman et al conducted a postal survey, to examine the influence of seven different sources and types of evidence-based guidance among senior health professionals in England¹¹. The study included directors of public health, clinical directors/consultants in hospitals, and GPs. This revealed some knowledge of selected evidence-based guidance, previous use, beliefs in quality, usefulness, and perceived influence on practice. It was found that 82% of the respondents had consulted at least one source of evidence-based guidance in the past. Professional respondents in the health authorities responsible for directing or purchasing health policy (87%) were significantly more likely than either hospital

consultants (52%) or GPs (57%) to perceive any influence on change of practice emanating from the specified evidence-based sources. Since a self-reported questionnaire was employed, bias of overestimation by the respondents cannot be excluded.

Holten et al conducted a study in Canada and USA to determine the attitude, knowledge, and educational needs of family practice residents on EBM.¹² Most of the respondents ranked themselves as having a positive attitude towards EBM. In this study, the actual background of the respondents was not known. Had they, for example, had previous training or any critical appraisal of EBM?

In another study, McAlister et al assessed the attitudes of practising general internists towards EBM in Canada¹³. The participants demonstrated a high level of interest in further education about EBM and reported high usage of traditional (non-EBM) information source. Only a minority used EBM-related information sources such as research studies (45%), clinical practice guidelines (27%), and Cochrane collaboration reviews (5%) on a regular basis. Less than half of the respondents were confident about the basic skills of EBM, such as, conducting a literature search (46%) or evaluating the methodology of published studies (34%).

Olatunbosun et al conducted a study about physicians' attitudes towards EBM obstetrics practice in Canada.¹⁴ The study included family physicians and obstetricians, 76% of whom were aware of EBM. More than half (51%) consulted a respected authority when faced with a difficult clinical problem, (37%) used traditional textbooks or clinical practice guidelines, while only (8%) conducted Medline researches. Obstetricians used Medline more than family physicians. Although only 40% considered EBM

applicable, (88%) expressed an interest in learning more about it. Apart from the problem of self-reported questionnaires, the methodology used was not clear.

In Australia, Young et al conducted a study in which physicians were asked to rate their understanding of EBM terminology.⁹ The participants were also asked to identify the criteria that indicated that they knew the correct meaning of the terms.

The participants' self-rating of their understanding of terms used in EBM differed from objective, criterion-based assessment. The participants' comments showed considerable misunderstanding about terms. Again, the method of sample selection was not mentioned nor was there an indication of how many GPs had had formal training in critical appraisal.

One investigator asked the respondent physicians to report their knowledge on EBM web resources. He put fictitious sources and called them "Effective Medicine Today". A number of respondents claimed to have had access to those fictitious publications. Over 11% of all respondents claimed to have read the publication while 7% stated that they had actually used it to improve their own clinical practice in the last two years.⁸ This is a clear demonstration that responses on EBM may not be reliable.

MAJOR BARRIERS TO THE PRACTICE OF EBM

Many barriers militate against EBM. In England, the main perceived barrier to practicing EBM in general practice was the lack of personal time; and McColl asserted that improving access to summaries of evidence would be more effective than teaching the skills of literature search and critical appraisal.⁷

In Canada and USA, insufficient time, insufficient evidence, and patient preference were the most cited barriers.^{2,12} While in

other studies, barriers cited by the respondents included the lack of relevant evidence, the fact that the concept was new, impracticality for use in day-to-day practice, and its negative impact on traditional medical skills and the "art of medicine".^{6,13} Scott et al in Australia, identified such barriers as insufficient time (74%), limited search skills (41%), and limited access to evidence (43%). Other reported barriers included: doubts about the applicability of trial data to particular patients, the effect of time and financial constraints, and the absence of an effective computer system.¹⁵ Similar results were obtained from a study in Saudi Arabia, where patient overload and the lack of personal time were considered the major perceived barriers to practising EBM.¹⁶

Many articles^{1,17-22} have pointed to the limitations of EBM, how to overcome them and the related misperceptions. They focused on three aspects; shortage of coherent consistent scientific evidence; difficulties in applying any evidence to the care of individual patients; and barriers to any practice of high quality medicine. There are also three limitations unique to the practice of EBM: the need to develop skills in searching and in critical appraisal; the limited time busy clinicians have to apply these skills; and the inadequacy of the resources required for access to evidence. There are unfounded so-called limitations, which arise from misunderstanding of what EBM really means. They state that it ignores clinical expertise and patients' values, or promotes a cookbook approach to medicine. Some believe that it is a cost-cutting tool. These are all not true.

PROMOTION AND IMPLEMENTATION OF EVIDENCE BASED MEDICINE

The internal medicine residency program at McMaster University has committed itself

to producing practitioners skilled in evidence-based medicine. Other clinical departments have devoted themselves to teaching EBM, and they have adopted strategies to implement the paradigm shift.¹⁸

A retrospective review was carried out by Gill et al to estimate the proportion of interventions in general practice that are based on evidence from clinical trials and the appropriateness of such an intervention in one suburban training general practice.²³ It was found that 81% of the interventions was based on evidence (partly based on controlled clinical trials), and others on convincing non-experimental evidence. Since it was a retrospective study within one training practice, its results cannot be generalized. The authors failed to find the evidence for all the interventions, and the methodological quality of the trials was not assessed. A similar study by Kenny et al to determine the proportion of pediatric surgical interventions that were evidence-based, demonstrated that the majority of pediatric surgical interventions were based on sound evidence.²⁴ However, only 11% of interventions were based on data on randomized control trials (RCT).

A project was undertaken within a network of GPs (the Monash Division of General Practice) in Melbourne, Australia, to promote evidence-based medicine.²⁵ The principal strategy was to conduct practice visits for academic detailing (which refers to university-based educational programs designed to improve physicians' clinical decision making with a view to enhancing the quality and cost-effectiveness of health care). Markey et al in another study measured the impact of academic detailing on GP attitudes and knowledge of EBM.²⁶ The sample was randomized into control and intervention groups. He found that academic detailing led to a significant improvement in knowledge scores and self-perceived understanding of EBM, but had

little influence on GP attitude towards it. In that study, the response rate was only 48%. It is possible that the group, which agreed to academic detailing, were more favorably disposed towards EBM. This means the positive findings in this study would only refer to GPs who are willing to be academically detailed.

Smith et al conducted clinical trials to measure the effectiveness of an educational intervention designed to teach residents four essential EBM skills: question formulation, literature searching, understanding quantitative outcomes, and critical appraisal in urban public hospital.²⁷ An EBM course was taught two hours per week for seven consecutive weeks. EBM skills were similar in the two groups. After the EBM course, the experimental group achieved significantly higher post-course test scores. This revealed that a brief structured educational intervention produced substantial and durable improvements in residents' cognitive and technical EBM skills.

SAFETY, EFFICACY, AND COST EFFECTIVENESS OF EVIDENCE-BASED MEDICINE

A case control study was conducted to compare the safety, efficacy, and cost effectiveness of evidence-based medical care versus usual care, for acute low back pain.²⁸ Special clinics were established, at which trained medical practitioners managed patients with acute back pain according to evidence-based guidelines. Evidence-based medical care resulted in significantly lower cost of treatment, significantly greater reduction in pain, sustained at both 6 and 12 months, significantly fewer patients requiring continuing care at 3, 6, and 12 months; significantly greater proportions of patients fully recovered at 12 months; and significantly greater proportions of patients

rating their treatment as extremely helpful and giving positive comments about their treatment.

Gazarian et al conducted a study to evaluate the effectiveness of evidence-based guidelines for the use of spacer devices in children with acute asthma in a tertiary care metropolitan children's hospital.²⁹ They found that there were successful changes in standard practice from using nebulisers to spacers for bronchodilator delivery in children with mild to moderately acute asthma, with no difference in the need for or duration of hospitalization.

Bampton et al conducted a prospective study to determine whether applying EB guidelines for colorectal cancer prevention would reduce the number of follow-up colonoscopies.³⁰ They found that adhering to the guidelines resulted in a 17% reduction in colonoscopies performed on the bases of family history of colorectal cancer.

In 1992, North Mississippi health services (NMHS) implemented a program to improve physicians' clinical efficiency using evidence-based guidelines and found that NHMS progressively reduced its Medicare loss and its length of stay (LOS). Mortality and readmission rates were reduced in specific diagnoses. The community-acquired pneumonia project reduced the LOS from 7.7 to 5.1 days, decreased the mortality rate from 8.9% to 5%. In addition, the ischemic stroke project reduced the aspiration pneumonia rate from 6.4% to 0% and mortality from 11% to 4.6%. Patients' average LOS decreased from 10.7 days to 6.5 days, and their cost of care was reduced by \$1,100 per patient.³¹ All these finding demonstrated that the implementation of EBM not only improved the health care offered to patients, but also reduced cost, making it more affordable. For this reason, the application of EBM in our countries would be most prudent as health cost and expenditure escalates daily

outstripping financial resources.

Some other research projects have documented that patients who received proven efficacious therapies would have better outcome than those who had not.³²⁻³⁴

A randomized controlled study was done by Lagerlov et al to ascertain the effect on the quality of prescribing by GPs, using guideline recommendations, in peer review groups for asthma and UTI.³⁵ It was found that the mean proportions of acceptably treated asthma increased by 6% after intervention which was statistically significant, and increased by 13% in UTI group, which meant an improvement in treatment.

The Vermont Oxford Network is a voluntary collaborative group of health professionals committed to improving the effectiveness and efficiency of medical care for newborn and their families through a coordinated program. One of the important components of its work is to generate evidence of practice by performing randomized clinical trials. This is supported and directed by committees for safety. The first trials introduced corticosteroid for antenatal management of women at risk of preterm delivery, and it was found that mortality rates for infants weighing 501 to 1500 g decreased.³⁶

To the best of the author's knowledge, there were no other clinical trials to prove that evidence-based medicine improved health outcome. This may be due to ethical concerns, as withdrawal evidence from the control is considered illegal.

EBM IN THE ARAB WORLD

The United Arab Emirates is a pioneer on EBM in the region. A national committee on Evidence Based Health Care was established in 1998, to promote EBM practice in UAE. They started by training hospital physicians on EBM. Health institutions were equipped with computers

and high-speed Internet lines. It was planned that EBM practice be included in the undergraduate curriculum, and EBM courses be given in internship programs.^{37,38} In Bahrain, the College of Medicine and Medical Sciences, Arabian Gulf University, held an EBM workshop in 1999, in collaboration with Oxford University (Cochrane reviews). They also ran workshops on EBM for their students.³⁹

In Syria, there was a unique experiment of establishing an Arabian center for EBM, the main objective of which was to help physicians who are trained in Arabic to become familiar with EBM. It worked by translating the systematic reviews, especially Cochrane systemic reviews, into Arabic, summarizing them, and updated them regularly. The aim of the center was to transmit new medical facts quickly to practicing physicians in order to improve the quality of medical services.⁴⁰

EBM IN SAUDI ARABIA

The EBM concept was introduced into the Kingdom of Saudi Arabia in the late nineties. A national EBM advisory board committee was formed in November 2000. The Minister of Health approved the committee whose main objective was to promote implementation of EBM in Saudi Arabia. The committee met several times and prepared a proposal of activities at central and peripheral levels to implement EBM. This included the establishment of a reference library, the regular updating of local websites, the establishment of training on EBM, the running of workshops and short courses for training doctors on how to practice EBM.⁴¹

Al-Ansary et al¹⁶ conducted a survey to assess the attitude of GPs towards EBM and determine their related educational needs in five regions in Saudi Arabia namely the Eastern Province, Riyadh, Asir, Makkah, and Jeddah. Respondents welcomed EBM,

although they had little knowledge and experience of extracting journals, reviewing publications and databases. The respondents showed partial understanding of the technical terms used in EBM. Several workshops on EBM were, therefore, held in different parts of the Kingdom and medical schools.

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