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Is evidence-based medicine a gold standard or can it be influenced?

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Editorial "Does modern medicine increase life-expectancy: Quest for the Moon Rabbit?"[1] is very timely and really very important given the hype created by the pharmaceutical industry about drugs and devices highlighting their mortality benefits. Question is, what are the methods or parameters which tell us about the mortality benefits of a particular drug or intervention and whether these can be influenced or not?[2]

1. Evidence-based medicine

Over the past 2 decades, evidence-based medicine (EBM) has increasingly been accepted as the gold standard for decision-making and standard for medical practice. Evidence-based practice guidelines and EBM approaches are at the core of today's scientific thinking with RCTs being regarded as the fundamental research response of EBM for healthcare.[3] The beginnings of the EBM approach were clearly focused on understanding the complexities of the 'workings of the healthcare system' and its relationship to making the 'best possible decision's for the care of patients'. However, these complexities have rapidly been reduced to a narrow focus on standardized and typically single disease management guidelines.[4,5] Epstein subscribing to the gold standard of RCTs, mentioned the difficulty of using them as the main source of information in outcome management/implementation and mentioned 'prospective effectiveness trials' as the alternative to RCTs.[6] The reliance of EBM on the RCT is useful for acute (mostly single disease) conditions treated with simple interventions, but this approach is not suitable in the current epidemiological context characterized by chronicity and multimorbidity in complex health systems. In particular, EBM has largely disregarded the importance of social determinants of health and local context and its real impact on the 'effectiveness' and 'efficiency' of healthcare on the 'equality' of needed healthcare services.[7,8]

2. Can EBM be influenced?

Doubts have been raised by large number of health professionals that pharmaceutical companies have infiltrated the medical research institutions and influenced peer-review process to promote drug marketing and a few but influential medical critics believe that the validity and veracity of peer-reviewed research is being undermined, subverting the foundation of EBM.[2,9] Researchers believe that unfavorable research results are eliminated from or camouflaged in the texts of industry-influenced studies and that data often are remolded in ways that present favorable results when a more transparent analysis might reveal substantial risk for patients taking the "hyped" medications.[10] Internist John Abramson,[11] wrote that the pharmaceutical industry has inserted itself into every aspect of medical practice from medical education to basic research and clinical care, enticing a number of respectable research physicians into endorsing questionable studies, co-opting the mechanisms of evaluation of effective treatment for widely accepted illnesses, but also it has successfully colonized the healthy population by the construction of an array of new illnesses.[12] Despite the idealized claim that EBM would be the product of objective research conducted by disinterested medical researchers, pharmaceutical industry-sponsored clinical trials can have a corrosive impact both on physicians who derive substantial income from their participation and, in turn, on evidence claims themselves. Moreover, not all clinical trial results are published, especially those whose results fail to demonstrate the benefits of an agent in a pharmaceutical-sponsored trial.[13] Because of increasing concerns of EBM being influenced, a special communication published in January 2006 in JAMA by a consortium of distinguished researchers, practitioners, and ethicists urged adoption of a series of measures aimed at insulating practitioners and academic medical researchers from what they believed to be the pharmaceutical industry's corrosive effect on medical research and practice.[14] These recommendations reveal the growing anxiety, among some highly regarded and influential medical faculty, that the pharmaceutical industry has placed the practice of medicine, especially EBM, at dire risk.

3. Medical research and funding

Since 1980, the share of biomedical research funding from industry sources has grown from 32% to 62%.[15] In USA, industry-sponsored research accounts for 58% of expenditures, NIH for 27% of expenditures, state governments for 5% of expenditures, non-NIH-federal sources for 5% of expenditures, and not-for-profit entities accounted for 4% of support.[16] The relationship that exists with industry-funded biomedical research is that of which industry is the financier for academic institutions which in turn employ scientific investigators to conduct research. A fear exists that a project funded by industry might hide negative effects to promote their product.[17]

4. Medical research and pharmaceutical industry

Three recent systematic reviews have shown that pharmaceutical industry funding of clinical trials is strongly associated with pro-industry results. There are multiple demonstrated causes of the

association of funding and results, ranging from trial design bias to publication bias; these are all rooted in close contact between pharmaceutical companies and clinical research.[18] To practice, EBM physicians need data on the clinical effectiveness, toxicity, convenience, and cost of new drugs compared with available alternatives and an article highlighted examples of published drug studies that are defective, sometimes because pharmaceutical industry funding has affected their content and quality.[19] There was a statistically significant association between the sources of funding and the outcome of the study. Three hypotheses were considered to explain these results: industry selects drugs likely to prove efficacious, study results are flawed because of sample not large enough, and researchers fear discontinuation of funding if studies do not show favorable results.[20] Results of several studies suggest that the source of funding affects decision-making by recipients. Research support from pharmaceutical companies was an independent predictor of requests for formulary additions from internal medicine faculty members at seven Midwest US teaching hospitals.[21] Another study reported a bias in favor of the sponsoring company's drug.[22] Another study showed a greater increase in prescriptions for the drug made by the sponsoring company than for other drugs in the same class.[23]

5. Is there a conspiracy preventing a disease cure?

There are people like me who believe that research on disease cure will never get funding and promotion because pharmaceuticals have a vested interest in keeping disease around as long as possible because treating disease is simply far too profitable than a cure could ever be. Take the example of diabetes, which is a multi-billion dollar industry, including sales of insulin, new and old oral agents and medical devices such as insulin pumps, glucose monitors and their pricey test strips, and new continuous glucose monitors. Why any pharma company will fund a cure for diabetes and kill a goose with golden eggs. John Thomas in an article explains why the current cancer industry prospers while treating cancer, but cannot afford to cure it.[24] An article reported that in 2010, Gleevec grossed $4.3 billion. Roche's Herceptin (the HER2 drug) and Avastin did even better: $6 billion and $7.4 billion respectively. Cancer plays a huge role in the rising costs of healthcare. America's National Institutes of Health predict that spending on all cancer treatment will rise from $125 billion last year to at least $158 billion in 2020.[25] The cancer factory is truly big business in America. This system cannot afford to permit anyone to find a cure for cancer. If any of the low cost highly successful alternative cancer treatments were to be approved for use, then this entire system would come crashing down. The pharmaceutical cartel will not let that happen.[26]

6. Conclusion

Benefits of therapeutic interventions (drugs and devices) are measured by various trials, what is known as EBM and fears are expressed that it can be influenced. Hype is created in favor of mortality benefits of drugs and devices, neglecting the immense morbidity and mortality benefits of life style modifications, which remain the most useful strategy for prolonging life at any stage, primary, secondary, or tertiary prevention. Moreover, drugs and devices are expensive and have some side effects, where as a healthy lifestyle is inexpensive, safe, and effective. Interventions or drug treatment of acute single disease definitely scores over life style modifications, but for all other stages of diseases, life style modifications are the best for mortality benefits. Such a scenario leaves common physician confused which trial to believe and follow. I firmly believe that under the hypnotizing influence of commercialization and market forces, common physician are reduced to a miserable pawn in the larger game of disease and fear.

Conflicts of interest

The authors have none to declare.

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Vitull K. Gupta[a,b*]
[a]*Kishori Ram Hospital and Diabetes Care Centre, India*
[b]*AIMSR, India*

Praneet Wander
Department of Medicine, Mount Sinai St Lukes Roosevelt Hospital, New York, United States

Meghna Gupta
Adesh Institute of Medical Sciences and Research, Bathinda, Punjab, India

*Corresponding author at: AIMSR, India
E-mail address: vitullgupta2000@yahoo.com (V.K. Gupta).

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