Johannes de Gorter: vertigo and the evidence-based medicine

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Abstract
In the last decade of the sixteenth century, we witnessed the emergence of a new way of conceiving medicine as a clinical method for transferring knowledge derived from scientific research to the treatment of individual patients. This method, based on the analysis and use of scientific evidence, has been proposed to support clinical, managerial and health policy decisions. Both the guidelines and open access were born from this new way of considering medicine and the need to make access to scientific contributions more usable and universal. This contribution aims to underline that in reality the idea of an evidence-based medicine was already present in the eighteenth century and that had as its exponent Johannes de Gorter, a Dutch doctor and prolific author of medical texts who was born in Enkhuizen, in the second half of the seventeenth century he arrived at the study of medicine at just 19 years old, he was a student of Herman Boerhaave, and who in the book " Medicina Dogmatica " expresses exactly the principles that also regulate the current EBM.

Introduction

The need for a scientific method not based solely on empirical experience has always been a constant concern for man. In the field of human health, the term "Evidence-based medicine" (EBM) was introduced in 1990 by Gordon Guyatt and the Evidence-Based Medicine Working Group (1) at McMaster University in Hamilton, where the best use of scientific literature for medical updating was studied, and is based on three fundamental parameters.

ATTITUDE: Knowing how to communicate with the patient and satisfy the "need for information" through well-defined clinical care questions

TECHNICAL SKILLS: Finding the best available evidence with maximum efficiency; Critically interpreting this evidence in terms of validity, relevance and applicability

CLINICAL EXPERIENCE: this determines the decisional weight of the evidence considered, taking into account the patient's preferences and expectations and the social, economic and organisational context

Ultimately, Evidence-based medicine requires new skills from the doctor,

- Knowing how to research sources
- Learning how to criticise them and evaluate their importance.
- Acquiring clinical experience based on the application of universal knowing

This new concept originated from a series of studies begun over 10 years earlier at the Department of Clinical Epidemiology and Biostatistics of McMaster University in Canada, whose objective was to make the best use of the scientific literature for medical updating.

From these roots, EBM has developed the concept that "evidence" must play a prominent role in therapeutic decisions, where "evidence" means updated, methodologically valid information from the medical literature.

Originally defined as "a new emerging paradigm for medical practice", EBM received, four years later, a more specific definition from Sackett et al. as "*the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients*."(2)

It was originally used to describe an approach to teaching medicine and improving physicians' decisions about individual patients. EBM aims to combine the clinician's experience (expertise), the patient's values, and the best available scientific evidence to inform clinical decisions.

EBM has developed in two areas of application: public health macro-decisions or decisions regarding homogeneous population groups, and medical practice on individual patients. This area of interest in EBM has given itself an essentially didactic mission: to teach doctors how to translate the need for information that emerges during a patient encounter into clear, defined ("answerable") questions. , and how to search the literature, select and apply the "evidence".

Even in the 18th century, scientific dissemination was in the hands of a few printers such as Manfrè in Padua, Ebner & Seubert in Stuttgart, Gronemberg in Wittemberg, and Vandenhoeck in London, often orbiting around the universities that managed knowledge by approving or not it's printing. The texts were essays and books by university professors, re-editions of ancient texts, Commentaries, Disputatio, etc. This spread the global approach to knowledge, which until then had been monopolised by the large scientific publishing multinationals, and practically allowed the diffusion of open access, the current system of large-scale scientific dissemination.

Johannis de Gorter

Among the many historical figures who expressed, in writing, ideas regarding a medicine free from prejudice and universal, particular attention is due to Joannis de Gorter (1689-1762 - Figure 1), an 18th-century author who was among the most prolific scientists of his time (Tab I). This Author may be interested us in his concept of Evidence-Based Medicine, particularly in **De Medicina Dogmatica** (Figure 2)

Johannis de Gorter was born in Enkhuizen, a popular port in the western part of the IJsselmeer (NL), on 19 February 1672. He became interested in medicine at a very young age and, at just 19, obtained his surgeon's license in his hometown. He enrolled at Leiden University in 1709 and became a student of Herman Boerhaave, considered the founder of clinical teaching and the modern hospital. His main achievement was demonstrating the relationship between symptoms and lesions. After three years, he obtained his doctorate with the dissertation de Obstructione (Leiden 1712- Figure 3). The same year, he returned to Leiden, where he opened a practice and continued his medical studies.

Mechanistic theories, begun with Descartes a century before, became the new basic structure for every science. All the research was oriented towards the close relationship between the organic structure (anatomy) and its functions (physiology), even if evaluated solely in terms of local movement. De Gorter also tried to apply mechanistic scientific methods. He measured the human body, weighed it and performed various experiments, which he published in 1725 in the text Perspiratione Insensibili (Figure 4). On Boerhaave's recommendation, he was appointed professor of Pharmacology at the University of Harderwijk on 15 October 1726, where he taught for almost thirty years. He corresponded with the famous scholars of his time. He made himself known through his writings, and this reputation also reached the court of the Russian Tsarina Elizabeth. She wanted to appoint him as her successor to Abraham Boerhaave at the court of St. Petersburg. In 1758, he returned to Nederland, where he died in 1762 He married Susanna van Bassen. With whom he had five children, four of whom pursued scientific careers; David de Gorter, would also become an excellent name in the scientific world as a doctor and botanist, Theodor de Gorter, also became a doctor and John de Gorter and Hermanus Boerhaave de Gorter, who took his name from his great master, that accompanied his father to Russia, later becoming a doctor in Amsterdam and a member of the

Dutch Society of Sciences in Haarlem and the Batavische Society in Rotterdam.

A prolific author, he produced an impressive number of scientific texts, some of which are still re-edited for enthusiasts of the history of medicine (Table 1)

His main work was **Medicina Hippocratica**. This is an overall presentation of the practical medicine of his time, which he explains using the aphorisms of Hippocrates, commenting on them and often contradicting them with the knowledge of then-modern medicine. In the preface to the reader, de Gorter expresses his concept of what a doctor should base his profession on: Experience, dogmas, and study, synthesised in two fundamental precepts: Check what you have read and Learn from the experience

The manifesto of his idea of a doctor was well defined in the dedication that De Gorter wrote to Boerhave in the work de perspiratione insensibili. When declaring his devotion to the master, he establishes the verification of experiments as the basis of medical science and considers it necessary during public exhibitions or conferences. The text, adhering to its dogma, verifies the statements of Santorio (Figure 4), an Istrian doctor and professor in Padua in 1611, who, in the De statica medicina (1614), discusses his quantitative research on metabolism and metabolic transformations using the medical steelyard. De Gorter verifies his observations and also broadens them by examining differences across countries.

But the book most interesting for evidence-based medicine is De Medicina Dogmatica (1751 - Figure 2) As in the commentaries of Hippocrates, in this publication, he also adopts the method of aphorisms, starting with a general statement, which he then comments on in light of the statements of ancient and contemporary authors who have made observations and carried out experiments on the topic. The exhibition provides a comprehensive update on the topic and includes not only the diagnosis but also the anatomical, pathophysiological, and therapeutic elements known at the time. It becomes a medical manual centred on three prevalent symptoms at the time

THE DELIRIUM, which he considers originated from three possible causes, described in the medicine of the time, leading to the alteration of the vital spirit: those disturbing the aqueous flow of the spirit, those which reduce it so that it is no longer sufficient to maintain the integrate the brain and those that change its character to the point of being unsuitable for function.

THE COUGH, which he defines as «sonic, alternating, convulsive expression of the air from the lungs through the larynx, which, however, the will can imitate in any way». The author clarifies all the pulmonary, laryngeal, cardiac, tuberculous, and inflammatory causes.

THE VERTIGO, where we find a very modern description and the distinction between objective and subjective vertigo.

Each chapter concludes with a series of questions for readers, a learning test similar to the ECM questions usually given at modern-day conferences.

I will not go into the merits of his observations as we know that Prospero Menière had not yet published his works. Therefore, vertigo was entirely centred on the eye, the brain, and the vital spirit. In this writing, the anatomy and physiology of the eye and the movements of the spirit are extensively described. However, the author curiously suggests a relationship between the ear and vertigo, stating that if the cerebral humour that leaves the ear is drained, vertigo disappears. And he writes a sentence that is unfortunately still valid for us today: "***Quodnam medicamentum est specificum? Respondemus nullum , quia vertigo est morbus ex phœnomeno***" (What medications are effective for vertigo? Nobody knows, because vertigo is a phenomenon disease).

But the most important chapter for evidence-based medicine is the oratione from which the book was born. De Gorter, addressing young students, contrasts two types of doctors. **The Empirical** doctor bases his art solely on his knowledge and experimentation with treatments, not on the disease but on the symptoms, and the therapy proceeds through trial and error. If, by chance, he has a result, he remembers it for possible other uses, often without effect. On the contrary, **the Dogmatic** doctor bases his art on dogmas, that is, on certainties. But who can give certainties to a dogmatic doctor? On the Lit-

erature. The books like this, which refer to all modern knowledge about Delirium, Tussim and Vertigo

Only the ability to investigate by asking the right questions, study diseases and remedies, and experiences described in the works of other doctors and verify them through the experiences gained during the practice of medicine. It is the modern vision of evidence-based medicine condensed in one sentence:

Nemo equidem potest tollere morbi causam quam ipse ignorat

No one can eliminate the cause of a disease they do not know.

In conclusion, the cornerstones of evidence-based medicine outlined in 1992 correspond to what was already expressed more than 250 years earlier by De Gorter. He was among the first to understand and teach young doctors that practical experience is nothing if it is not accompanied by study and the ability to understand, to know how to interpret, and to verify what the literature says in the light of one's own experience.

Figures

1. Oratio inauguralis de dirigendo studio in Medicinae praxi, sive de tabb. Per disciplina med. concinnandis. Leida 1727, Patav. 1751.
2. De traspirazione insensibile. 1725, 1736.
3. Oratio de practice med. repurgatae certezza. Leida 1731, Patav. 1751.
4. Oratio de animi et corporis consensione mirabili, tam in secunda, quam adversa valetudine. 1731.
5. Descrizione dell'algemeene doorgaande ziekte. Amsterdam 1733.
6. Morbi epidemici brevis description et curatio. Harderwijk 1733. Patav. 1751.
7. Ipotesi nova de febrium intermittentium causa. Harderwijk 1735.
8. Chirurgia Repurgata 1735
9. Compendio medicinae in usum exercitat. domestico. digesto. 2 volumi 1731–1737.
10. Exercitationes medicae quatuor. Amsterdam 1737.
11. Medicina Hippocratica esponens aphorismos Hippocratis. Amsterdam 7 volumi 1739–1742
12. Medicinae Dogmatica, de Delirio, Vertigine ac Tussi. Harderwijk 1741, Patav. 1751.
13. Chirurgia repurgata, ab auctore recensita etc. Accessit materia medica Chirurgiae repurgata 1742
14. Esercizio medica quinta de actione viventium particolari. Amsterdam 1748.
15. Pratica medicae systema. Harderwijk 1750, 1767.
16. Methodus dirigendi studium medicum. Harderwijk 1753.
17. Formule medicinales cum indice virium. Amsterdam 1755.
18. Formulas medicinales: quo ad inventas indicaes inveniuntur medicamina. Amstelodami: de Tournes, 1755.

Table I. Johannes de Gorter bibliography

Figure 1. Johannes de Gorter Portrait

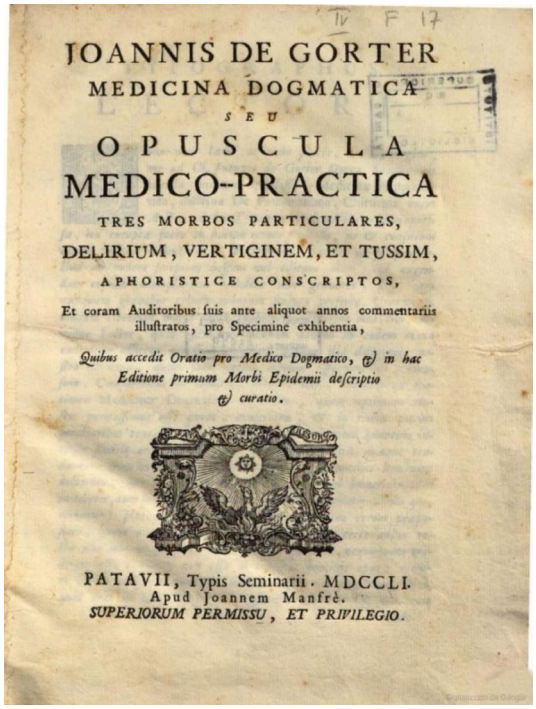


Figure 2. the front page of Medicina dogmatica 1751

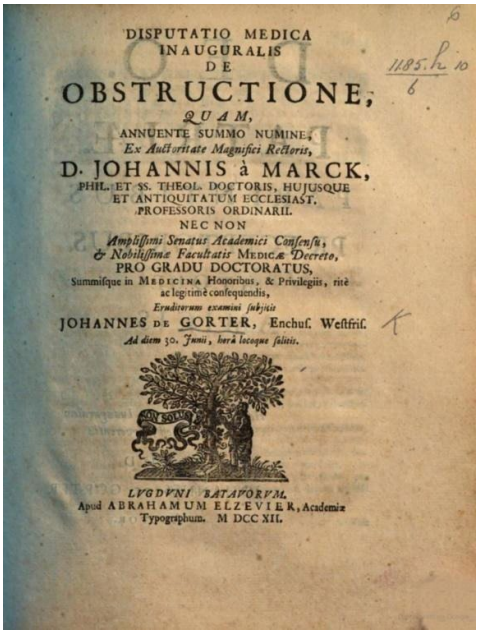
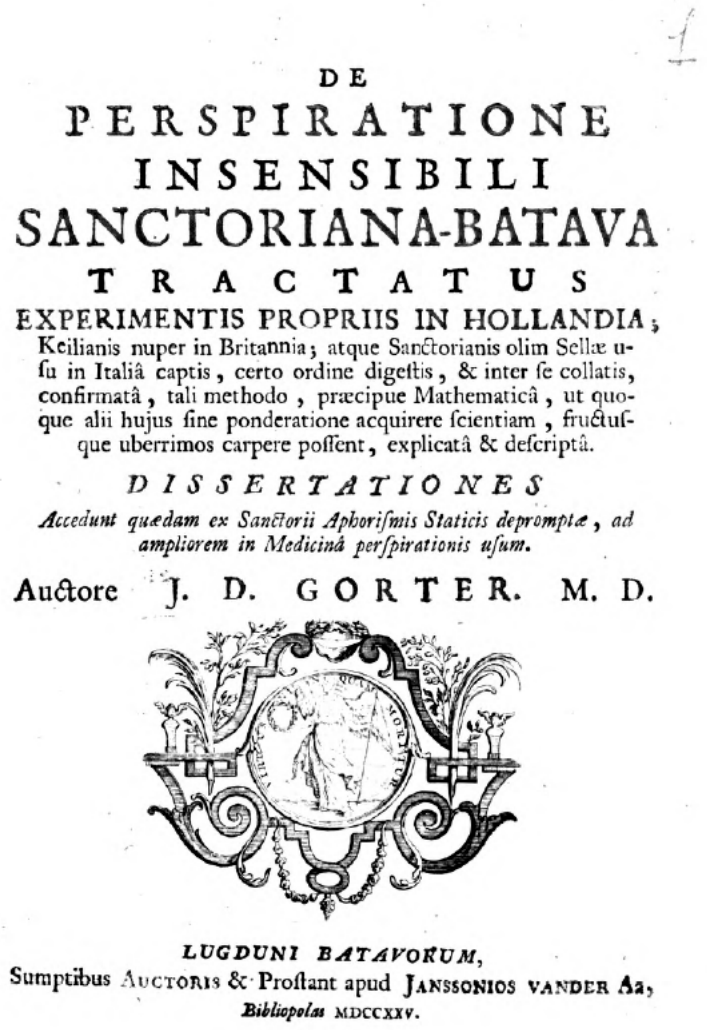


Figure 3. the front page of disputatio medica inauguralis De Obstructione (1712)

Figure 4. Santorio Portrait: Doctor (1561 - 1636). Having graduated from Padua in 1582, he settled in Venice in 1599, where he achieved considerable success as a practical doctor He, the inventor of the clinical thermometer, was called to the chair of theoretical medicine in Padua in 1611 (which he held until 1624)



DE
PERSPIRATIONE
INSENSIBILI
SANCTORIANA-BATAVA
TRACTATUS
EXPERIMENTIS PROPRIIS IN HOLLANDIA;
Keilianis nuper in Britannia; atque Sanctorianis olim Sellæ usu in Italiâ captis, certo ordine digestis, & inter se collatis, confirmatâ, tali methodo, præcipue Mathematicâ, ut quoque alii hujus sine ponderatione acquirere scientiam, fructusque uberrimos carpere possent, explicatâ & descriptâ.
DISSERTATIONES
Accedunt quædam ex Sanctorii Aphorismis Staticis deprompta, ad ampliorem in Medicinâ perspirationis usum.
Auctore J. D. GORTER. M. D.
LUGDUNI BATAVORUM,
Sumptibus Auctoris & Prostant apud Janssonios vander Aa,
Bibliopolas MDCCXXV.

Figure 5. Front Page Perspiratione insensibili

References

Guyatt GH. (1991). Evidence-Based Medicine [editorial]. ACP Journal Club 1991:A-16. *Annals of Internal Medicine; vol. 114, suppl. 2*

Sackett, D. L., Rosenberg, W. M., Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence based medicine: what it is and what it isn't. *BMJ* (Clinical research ed.), 312(7023), 71–72.