Googling for a diagnosis—use of Google as a diagnostic aid: internet based study

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Googling for a diagnosis—use of Google as a diagnostic aid: internet based study
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Abstract

Objective To determine how often searching with Google (the most popular search engine on the world wide web) leads doctors to the correct diagnosis.

Design Internet based study using Google to search for diagnoses; researchers were blind to the correct diagnoses.


Cases 26 cases from the New England Journal of Medicine; management cases were excluded.

Main outcome measure Percentage of correct diagnoses from Google searches (compared with the diagnoses as published in the New England Journal of Medicine).

Results Google searches revealed the correct diagnosis in 15 (58%, 95% confidence interval 38% to 77%) cases.

Conclusion As internet access becomes more readily available in outpatient clinics and hospital wards, the web is rapidly becoming an important clinical tool for doctors. The use of web based searching may help doctors to diagnose difficult cases.

Introduction

Doctors adept at using the internet use Google to help them diagnose difficult cases. As described in the New England Journal of Medicine, a doctor astonished her colleagues (including an eminent professor) by correctly diagnosing IPEX (immunodeficiency, polyendocrinopathy, enteropathy, X linked) syndrome. She admitted that the diagnosis “popped right out” after she entered the salient features into Google.

It seems that patients use Google to diagnose their own medical disorders too. After evaluating a 16 year old water polo player who presented with acute subclavian vein thrombosis, one of us (HT) started to explain that the cause of the thrombosis was uncertain when the patient’s father blurted out, “But of course he has Paget-von Schröter syndrome.” Having previously googled the symptoms, he gave us a mini-tutorial on the pathophysiology (hypertrophy of the neck muscles leading to dynamic compression of the axillary vein at the thoracic inlet—leading to thrombosis) and the correct treatment of the syndrome. This experience led us to ask: “How good is Google in helping doctors to reach the correct diagnosis?”

Method

We selected a convenient sample of one year’s (2005) diagnostic cases presented in the case records of the New England Journal of Medicine. We excluded management cases. After discussion, we selected three to five search terms from each case record and entered them on a data sheet. We then did a Google search for each case while blind to the correct diagnoses (that is, before reading the differential diagnosis and conclusion of each case record). We selected and recorded the three most prominent diagnoses that seemed to fit the symptoms and signs. We then compared the results with the correct diagnoses as published in the case records.

Results

We identified 26 cases from the case records (table 1). Google searches found the correct diagnosis in 15 (58%, 95% confidence interval 38% to 77%) cases. In some cases (for example, case record 9), Google gave the correct diagnosis (extrinsic allergic alveolitis) but we felt that it was not specific enough to be considered correct (extrinsic allergic alveolitis caused by Mycobacterium avium, also known as “hot tub lung”).

Discussion

Clinical decision support programs have been reported to be valuable aids in diagnosing difficult cases. Hoffer reported using a clinical decision support program to make the diagnosis of Addison’s disease expeditiously when it was missed by many expert clinicians. We think that Google is likely to be a useful aid in diagnosis too. It has the advantage of being easier to use and is freely available on the internet.

A few limitations of this study should be mentioned. Arguably, everything could be found on An extra table is on bmj.com
We chose between three to five search terms for each case, depending on symptoms and signs that we felt would not return a non-specific result. We selected “statistically improbable phrases” whenever possible, such as “cardiac arrest sleep” in case record 37. We generally selected likely diagnoses from the first three pages (maximum five pages) of the search result, containing 30 documents, to see if the condition would fit the case record. As Google does not “suggest” a diagnosis, we selected the diagnosis that we felt would fit best with the case record. When none of the diagnoses found with Google fitted the case record well, we chose up to three most likely diagnoses. If one of the diagnoses was correct, we regarded the search as successful.

We suspect that using Google to search for a diagnosis is likely to be more effective for conditions with unique symptoms and signs that can easily be used as search terms, such as the one described by Greenwald.1 Searches are less likely to be successful in complex diseases with non-specific symptoms (case records 10 and 14) or common diseases with rare presentations (case record 18).

The efficiency of the search and the usefulness of the retrieved information also depend on the choice for retrieving medical articles. Searching with Google may help doctors to formulate a differential diagnosis in difficult diagnostic cases. What is already known on this topic

Doctors and patients are increasingly using the internet to search for health related information.

Google is the most popular search engine on the web.

What this study adds

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tools in clinical medicine, and doctors in training need to become proficient in their use.

Contributors: HT had the idea and designed the study. JHKNN helped in the study design. Both authors did the search and analysis and wrote the paper. HT is the guarantor.

Funding: None.

Competing interests: None declared.

Ethical approval: Not sought. The subjects were published cases in the New England Journal of Medicine with no patient identifiers.

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Lifetime cost effectiveness of simvastatin in a range of risk groups and age groups derived from randomised trial of 20 536 people

Heart Protection Study Collaborative Group

Abstract

Objectives To evaluate the cost effectiveness of 40 mg simvastatin daily continued for life in people of different ages with differing risks of vascular disease.

Design A model developed from a randomised trial was used to estimate lifetime risks of vascular events and costs of treatment and hospital admissions in the United Kingdom.

Setting 69 hospitals in the UK.

Participants 20 536 men and women (aged 40-80) with coronary disease, other occlusive arterial disease, or diabetes.

Interventions 40 mg simvastatin daily versus placebo for an average of 5 years.

Main outcome measures Cost effectiveness of 40 mg simvastatin daily expressed as additional cost per life year gained. Major vascular event defined as non-fatal myocardial infarction or death from coronary disease, any stroke, or revascularisation procedure. Results were extrapolated to younger and older age groups at lower risk of vascular disease than were studied directly, as well as to lifetime treatment.

Results At the April 2005 UK price of €4.87 (€7; $9) per 28 day pack of generic 40 mg simvastatin, lifetime treatment was cost saving in most age groups and vascular disease risk groups studied directly. Gains in life expectancy and cost savings decreased with increasing age and with decreasing risk of vascular disease. People aged 40-49 with 5 year risks of major vascular events of 42% and 12% at start of treatment gained 2.49 and 1.67 life years, respectively. Treatment with statins remained cost saving or cost less than £2500 per life year gained in people as young as 35 years or as old as 85 with 5 year risks of a major vascular event as low as 5% at the start of treatment.

Conclusions Treatment with statins is cost effective in a wider population than is routinely treated at present.

Introduction

Large randomised trials have shown that lowering blood concentrations of low density lipoprotein cholesterol with statins greatly reduces rates of heart attacks, strokes, and revascularisation procedures in a wide range of people at high risk, largely irrespective of their cholesterol concentrations and other characteristics at presentation.1 The heart protection study has shown that, especially when cheaper generic versions are used, 40 mg simvastatin daily is cost effective for a wider range of people with vascular disease or diabetes than previously thought.2

A table, a technical appendix, and details of collaborators, participating hospitals, and committees are on bmj.com

This is the abridged version of an article that was posted on bmj.com on 10 November 2006: http://bmj.com/cgi/doi/10.1136/bmj.38993.731725.BE