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. 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 the web if only one knew the correct search terms. In this case, we chose a combination of search terms that we felt would be unique (see extra table 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 such as Paget–von Schrötter 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.

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”).
and signs that can easily be used as search terms, such as the one described by Greenwald. 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 searchers’ knowledge base. In this case, although we were blinded to the correct diagnosis, one author was a respiratory and sleep trainee and the other a rheumatologist; sometimes the diagnoses were evident to us, and this could have affected our choice of search terms. When choosing the “correct” diagnoses from a list of possible choices returned by Google, we tried to avoid using specialist knowledge but chose diagnoses that were ranked most prominently and seemed to fit the case record. Therefore, for case record 9, where we made the correct diagnosis of “hot tub lung,” searching with Google did not give enough prominence to hot tub lung for it to be considered the correct answer.

Patients doing a Google search may find the search less efficient and be less likely to reach the correct diagnosis. We believe that Google searches by a “human expert” (a doctor) have a better yield, as Google is exceedingly good at finding documents with co-occurrence of the signs/symptoms used as search terms and human experts are efficient in selecting relevant documents. Furthermore, doctors in training would find the Google searches educational and useful in formulating a differential diagnoses.

The role of diagnosticians remains one of the most challenging and fulfilling roles of a physician. Physicians have been estimated to carry two million facts in their heads to fulfill this role. With medical knowledge expanding rapidly, even this may not be enough. Search engines allow quick access to an ever increasing knowledge base. Google gives users ready access to more than three billion articles on the web and has far exceeded PubMed as the search engine of choice for retrieving medical articles. Google has been so popular that the word has entered the English lexicon as a verb. Google Scholar, currently in beta form (www.scholar.google.com), is likely to be even more useful as it searches only peer reviewed articles.

Conclusions

Doctors and patients are increasing proficient with the internet and frequently use Google to search for medical information. Twenty five million people in the United Kingdom were estimated to have web access in 2001, and searching for health information was one of the most common uses of the web. Computers connected to the internet are now ubiquitous in out-patient clinics and hospital wards. Useful information on even the rarest medical syndromes can now be found and digested within a matter of minutes. Our study suggests that in difficult diagnostic cases, it is often useful to “google for a diagnosis.” Web based search engines such as Google are becoming the latest tools in clinical medicine, and doctors in training need to become proficient in their use.

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

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References


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 world wide web

What this study adds

Searching with Google may help doctors to formulate a differential diagnosis in difficult diagnostic cases
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