Investigation of Colposcopy Information on the Internet

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The Internet is a massively expanding body of information which includes medical resources. It is easier than in the past for anyone with some knowledge and effort to access the Internet. Medical professionals as well as patients have a similar ability to research a medical topic through the Internet. As medical professionals, we are concerned whether the medical information found on the Internet by patients is current and accurate. There are relatively few reports that critically examine where patients and family members acquire medical information. To assess the accuracy and completeness of information regarding colposcopy on the Internet, we categorized and defined the information on the Internet through systematic study. We chose eight search engines available on the homepage of Explorer to search and analyze the information obtained from a search for the topic of colposcopy. In addition, we analyzed whether the colposcopy information contained peer-review or reference in order to evaluate its reliability. The numbers of uniform/universe resource locators (URLs) varied considerably, ranging from 11 to 23300, when we tested the search engines using different combinations of capitalization and spellings. Descriptions of information from 181 sites located by a search engine (Yahoo) were also evaluated into five types, ranging from diagnostic to anecdotal information. In terms of the peer-review system, inaccurate or misleading information was found on web pages which might lead patients to doubt and distrust their medical specialists whose information was contradictory to that which they had obtained themselves. We recognize that the Internet has a positive and potential power in partnership with medical professionals to educate patients, helping them to overcome their disease. Nevertheless, we suggest the need to take an active role in identifying the Web sites containing accurate medical information and evaluating their quality.

Key Words: Colposcopy, internet, information

INTRODUCTION

There has been a dramatic change over the past 20 years in Internet use ever since 1969 when the Internet was originally a part of federally-funded research programs of the United State Department of Defense. During the late 1980's, however, the population of Internet users and network constituents expanded internationally and began to include commercial facilities. Indeed, the bulk of the system today is made up of private networking facilities in educational and research institutions, and businesses and government organizations across the whole world.[1] The development of the World Wide Web (WWW) in the 1990s has revolutionized the computer and communications world like nothing before. It makes it possible for anyone with basic computer skill to obtain and exchange any kind of information regardless of geographic location. The number of world-wide Internet users is over 60 million and the number of Korean Internet users has surpassed 5 million. They surf the Internet playing computer games, shopping and even making airplane reservations, as well as getting useful information.

There has also been much change in accessibility to medical information. We are living in an expanding world of the Internet in which any kind of medical information can be easily found by patients as well as medical professionals.[2-4] Even prior to the advent of the Internet as a source of medical information, patients were becoming more informed regarding their diseases

and treatments.[5] These patients used to depend on medical professionals for this information through conversations, pamphlets, videos, or books available to physicians. Some active patients would search Index Medicus or MEDLINE in the medical libraries or public institutions to get peer-reviewed medical articles.[6,7] Nowadays, the massive body of the Internet provides patients with a boundless amount of information. In addition, not only medical experts but also anyone with basic computer skills can establish web sites where they are able to share medical information with others. However, the quality of this newly gained information should be considered as an important issue.

As medical professionals, we can not but be concerned about the accuracy and currency of the medical information which our patients have found on the Internet. The reliability and scientific usefulness of the medical information of medical journals or papers are due to the peer review system, in which publications have been reviewed by acknowledged experts for their opinions and recommendations.[6] The peer-reviewed articles provide a guarantee to readers that they have been scientifically examined and that the conclusions drawn by the authors are reasonably reliable.

Cervical cancer is the most common gynecologic malignancy in Korea, occupying approximately 12% of all female malignancies. According to the annual report of the committee of the Korean gynecologic cancer registry, around 4000 women are newly diagnosed with the disease every year, suggesting its importance in female healthcare.[8] Colposcopy is a technique that allows for stereoscopic, binocular magnification of the tissues of the vulva, vagina, and cervix under a focused beam of light. The technique was originally described by Hans Hinselman in Germany in 1925 in an effort to gain an enhanced understanding of the pathogenesis of cervical neoplasia.[9] Over the last three decades, colposcopy has developed as an integral component in the detection and diagnosis of cervical cancer.

If our patients search for information about 'colposcopy' through the Internet, can they obtain information with the same reliability and assurance as from peer reviewed articles? In this study, we conducted a systematic analysis of the

'colposcopy' information found on the Internet to evaluate its accuracy and reliability. We also categorized the information about 'colposcopy' available through the Internet.

MATERIALS AND METHODS

We used eight search engines available on the homepage of Microsoft Internet Explorer, a popular Internet browser, to evaluate the number of Internet addresses or universal resource locators (URLs). Supposing patients search for medical information related to gynecologic diseases through the Internet, huge amounts of information will be yielded because of the wide breadth of the topic. To narrow the boundary of our search, one medical topic, colposcopy was selected in the present study.

Firstly, we selected eight search engines including four Korean (http://www.yahoo.co.kr, http://www.simmani.com, http://www.infocop.com, http://www.mochanni.com) and four foreign (http://www.yahoo.com, http://www.altavista.com, http://www.lycos.com, http://www.webcrawler.com) ones, to assess the number of addresses or URLs given for the topic of colposcopy.

Secondly, to examine the variability occurring from such information searches, each search engine was tested according to the use of combinations of capitalization and the Korean word for colposcopy, "Jilwhacdaegyung", besides "colposcopy" in the case of Korean search engines.

Thirdly, a rating system was developed to evaluate each Internet Web page for its usefulness and relevance to the search topic. It was specifically examined whether the site included medical information, whether the information was general or anecdotal, and whether it was peer reviewed.

Finally, each evaluation of the site was conducted on the basis of the initial appearing page; hyperlinks were not be followed to other parts of the web site. An exception, in which one hyperlink was allowed to the page listed, was made if the initial page was a table of contents with "colposcopy" listed.

The Pearson's chi-square test was used for statistical analysis with the assistance of the SPSS package (SPSS, Chicago, IL, USA). A p value less

than 0.05 was considered a statistically significant difference.

RESULTS

The numbers of URLs varied considerably from 11 to 23300 when we tested eight search engines using combinations of capitalization and spellings. Each search engine presented different numbers of URLs; among the 8 search engines Yahoo showed the greatest number and Missdachani the smallest number. The use of different language affected the results from the Korean search engines; in the case of Shimmani, a Korean search engine,161 sites were obtained when the searched term was the Korean "Jilwhacdaegyung", while 3829 sites were presented when "colposcopy" was searched. However, there was no significant difference in the number of URL outputs among the search engines. Although Alta Vista and Lycos gave equal numbers of URLs, independent of capitalization, the others (Yahoo and Webcrawler) did not (Table 1).

In our study, we selected YahooKorea (www.yahoo.co.kr), one of the most frequently used search engines in Korea, to evaluate and analyze all 181 URLs found on Yahoo Korea. Of the 169 URLs evaluated, after 12 sites which couldn't be recognized by content were excluded, 101 sites contained web pages related to diagnostic description or general information for colposcopy, and another 25 sites dealt with information regarding specific treatment. However, there were 12 sites which provided interesting anecdotal information which contained no medical information, and a further 30 sites were homepages of private clinics or general hospitals advertising their hospitals with brief medical information (Table 2).

We also categorized the providers or reference sources of the sites to evaluate the quality of the medical information supplied (Table 3). Sixty sites were provided by university or public institution and gave useful medical information to be peer reviewed. On the other hand, 47 sites were prepared by companies or general institutions that were not related to medical professionals, and these only gave superficial information. There were 48 sites provided by lay people or obstetrics and gynecology (OBGYN) private clinic doctors, and 26 sites contained no reference to peer review.

DISCUSSION

Many review systems for medical information

Table 1. Yield of Sites by Search Engine with Different Spellings of the Search Topic

Search Engine	URL	Spelling 1 colposcopy	Spelling 2 Colposcopy	Spelling 3 Jilwhacdaegyung	p value
Domestic Engines					0.998 (chi-square)
	http://www.yahoo.co.kr/	181	181	246	
	http://www.simmani.com/	161	160	3829	
	http://www.infocop.com/	22	17	73	
	http://www.mochanni.com/	14	14	11	
International Engines					0.963 (chi-square)
	http://www.yahoo.com/	21900	23300		
	http://www.altavista.com/	143950	14395		
	http://www.lycos.com/	14796	14796		
	http://www.webcrawler.com	7254	7256		

Statistics were analyzed with SPSS for Windows (SPSS, Chicago, IL). Pearson's chi-square test was used in statistical analysis. A p-value of < 0.05 was considered statistically significant.

Table 2. Description of Information on Web Pages for the Search Term 'Colposcopy' (n=169)

Number of Type of information	Web pages
Diagnostic or general information	101
Treatment information	25
Commercial view with medical information	30
Anecdotal or testimonial	12
Alternative medicine	1

Table 3. Type of Information for Web Pages with the Search Term "Colposcopy" (n=181)

Number of Sources	Web pages
University or Institute	60
Company	47
Private sites	48
Others*	26

*Only linked web pages.

have been developed for Internet use. However, they remain incomplete and it is doubtful whether they are actually helpful or not. In this study, web pages which are apt to be misunderstood or which contained unclear facts were found and they are thought to have lots of problems. For a publication, the peer review system plays the important role of information censorship; however, on the Internet there is no such system to apply sanctions and this is one of the major problems of the Internet. However, if a person accesses a website about colposcopy and finds some information on the Internet, thousands of records about colposcopy will be encountered. Many people do not recognize that a precise instrument like a computer can present inaccurate and wrong information. In this flood of information, it is of concern that the technical appearance of websites, such as graphics, sound and color, is more influential on patients and people than the quality and value of the medical information they contain. As seen in this study, most of the data reviewed on the Internet have not undergone a peer review system and some of the presented information is erroneous.

One of the negative effects arising from patients searching for medical information through the Internet is that it could promote mistrust between doctors and patients.[2-4] Although the proportion of documents that are inaccurate and apt to be misunderstood is small, the negative effect on patients is significantly larger. Even a very subtle inaccuracy can cause mistrust between doctors and patients. For example, if a doctor gave a different explanation about colposcopy to that which the patient had obtained from the Internet, the patient could experience doubt and a lack of trust in the doctor. Furthermore, no matter how hard a patient may look for medical information, only a few truly helpful websites will be found, resulting in a waste of much precious time for the patient. It remains extremely bothersome trying to access medical information by using searching tools and a great deal of time can be expended. Actually, 28% of URLs presented in the list from each search engine were inaccessible or written in other languages than English, and some of the websites only have links without any contents.

Nevertheless, the Internet has useful potential for both doctors and patients. It seems that the Internet can be a powerful and positive partner for medical workers in educating patients if

appropriate and accurate information can be provided through the Internet with a peer review system.[3,4,10] The more a patient is interested in selecting the appropriate remedy, the more the patient will know about his/her illness, and the more the patient will take care of his/her health; consequently better results can be expected from treatment.

Therefore, first, doctors should not be afraid of receiving information newly received by patients from the Internet. They should rather analyze the information with their patients and use this situation as an opportunity to develop themselves. Medical workers should recognize the case of patients arriving with medical information that they are not yet aware of, not as a challenge to themselves but as a part of patients' efforts to learn about their illness. Second, medical workers and other health-related professionals should take the initiative in actively educating patients regarding the variety of web documents and the presence of wrong information. In addition, they should let their patients know about the procedure of the peer review system so that patients can understand the importance of this system in reviewing medical information. If patients are aware of the strictness of the reviewing standards that are applied to medical journals, they will be able to distinguish between the important information that can be found in such journals from the erroneous information that can easily be obtained over the Internet. Finally, doctors should be able to offer the best possible help to patients by making the most relevant and recommended websites in cooperation with experts in each field. For this, our department runs a search engine for medical information websites (http://www. severance.or.kr/obgyn/). Medical workers should review websites carefully, using the opinion of experts in specific fields, and should classify the information carefully with orthodox methods before uploading it onto the websites over the Internet.

The Internet is an ever expanding, huge mass of information.[11-14] Patients, as well as medical professionals, can easily obtain huge amounts of information through the Internet. As demonstrated in this study, 23300 websites could be found by searching for 'colposcopy'. Though

only a little information is inaccurate or wrong, we can't ignore the negative effects that might affect patients. Medical professionals should be open-minded in accepting the habit of patients to retrieve information from the Internet, and they should direct patients to those websites with accurate information. Therefore, medical professionals should actively educate patients about the variation in the value and quality of the medical information available from the Internet, and demonstrate that the peer review system contributes a lot in spreading accurate and important medical information. In order to improve the education and treatment for patients through the Internet, it is time for medical professionals to facilitate a fair reviewing system to judge the accuracy and helpfulness of the medical information available on the Internet for the patients' sake.

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