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What's trending now? An analysis of trends in internet searches for labor epidurals

C.D. Sutton, B. Carvalho

Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University School of Medicine, Stanford, CA, USA

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ABSTRACT

Background: The study aim was to investigate internet use for obtaining information about epidurals for labor and delivery.

Methods: Google Trends for US data was queried from 2004 to 2015 to find the most common searches and determine temporal trends. The Google Trends query used the term [epidural] and evaluated changes in search trends over time. Search comparisons were made for each year from 2004 to 2015, and three equal time epochs during the study period (2004–07, 2008–11, 2012–15) were compared. We also compared searches for epidurals with commonly searched birth-related terms.

Results: Internet searches are increasing; there were 726000 searches for [epidural] in 2015. Search terms with the most significant growth in the past 4 years (2012–15) were “birth with epidural,” “pain after epidural,” “labor without epidural,” “epidural birth video,” and “epidural vs natural.” Searches for epidural side effects, risks, and pain on insertion were among the most common and were increasing most rapidly. Searches related to epidurals were more common than searches related to “natural births”, “home births”, and “labor pain”, but were less common than searches for “midwives” or “doulas”.

Conclusion: The findings provide an insight into internet use by those seeking information about labor analgesic options. Identifying the most common and rapidly increasing online search queries may guide physician-parturient interactions and online content creation, to address labor analgesic topics that most interest users.

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Introduction

Pregnant women often make decisions regarding labor analgesia before speaking with an anesthesiologist or obstetrician. Typically, parturients meet an anesthesiologist for the first time during labor, often while in pain, when detailed discussion about analgesic options is difficult. Information about analgesic options is usually acquired by the expectant mother prior to the onset of labor and is obtained from various sources, including maternity care providers, childbirth education classes, books, friends, and the internet.^{1,2} In one study only 34% of women reported that physicians were their main source of information about labor analgesia.¹

A nationwide survey of pregnant women showed that use of the internet as a source of health information about childbirth is increasing, from 76% in 2005 to 97% in 2011–12.² Surveys have consistently shown that

internet search engines such as Google (Google Inc., Mountain View, California) are now the most common method of obtaining information online, with 94–99% of women searching for pregnancy-related information at some time during pregnancy.^{2–4} Obstetricians also use search engines to understand better the sources of educational information related to pregnancy and childbirth available on the internet.⁵ Despite widespread use of the internet to obtain health-related information, there are no published data providing detailed information regarding internet search habits related to labor analgesia. Understanding what internet users seek to learn about labor analgesia may help physicians more efficiently address the information needs of their patients, and guide internet content-creators to provide information most commonly sought by users.

The aim of this study was to investigate internet searches for information about epidural analgesia for labor and delivery. Specific study objectives were to use Google Trends to assess the most common searches related to epidurals between 2004 and 2015, identify

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Correspondence to: B. Carvalho.

E-mail address: bcarvalho@stanford.edu

temporal trends during the study period, and measure the number of searches related to epidurals and commonly searched birth-related terms.

Methods

After obtaining Stanford University Institutional Review Board exemption, we queried Google Trends for data regarding searches about epidurals. Google Trends is an open access tool that can be used to obtain information about internet search habits. It uses automated trend analysis of searches performed on the Google Search website. When users enter an input term into Google Trends, it provides data on temporal and geospatial trends and related searches performed by people who searched for that original input term. This real-time information is reported using the relative search volume (RSV), which is determined by scaling weekly search volume relative to the highest search proportion week (RSV=100). For example, if a week has an RSV of 25, the search volume for the specified query during that week was 25% of the highest ever observed search volume for that query. Data are presented in terms of relative volume to minimize the confounding effects of changes in raw search volume (for example, the total number Google searches is increasing over time). Users can restrict analysis by geographic location, time period, or category.

We performed a preliminary, unrestricted Google Trends query for the term [epidural]. The data output included many results in languages other than English, so the query was repeated but the geographic location was limited to the United States. As expected, not all searches for the term [epidural] were obstetrics-related. Previously published analyses of consumer search behavior for health information have shown that searchers use simple, short search terms and infrequently click on links beyond the first ten search results.⁶ The input term was further refined using selection of search input variables described in a systematic review of Google Trends use in healthcare research.⁷

“Top searches” are the most frequently searched terms during the same search session as the original input term (within the given restrictions for region or category). We identified the ten Google Trends “top search” results for the term [epidural], and then performed a standard Google search (www.google.com). If the standard Google search result did not contain an obstetrics-related result within the first full search results page, it was excluded from the final Google Trends term using the “-” command, which limits results to searches that contain the first word and excludes words that follow the “-” sign. Further refinement of the search term was made until a standard Google Search from the first ten “top searches” yielded obstetric-related results. The final Google Trends input

term, [epidural -cervical -hematoma -injection -steroid], provided data on searches including the word “epidural” but excluded any searches that used the words “cervical,” “hematoma,” “injection,” or “steroid.”

Data from the United States between January 2004 (the first date available for Google Trends data) and December 2015 were obtained without restriction by category. Total search volume was estimated using Google AdWords Keyword Planner which determined the average number of searches per month for the search term [epidural] over a one-year period from 2014–2015. A best-fit line for search volume over time was made using a least squares calculation with the raw data obtained from Google Trends.

“Rising searches” are terms that were searched for with the original search term, which had the most growth in search volume during a specific time period. Growth is expressed in percentage growth relative to the previous time period. Data were obtained for three equal time periods for both “rising searches” and “top searches”: January 2004–December 2007, January 2008–December 2011, and January 2012–December 2015.

Google Trends data were also evaluated for commonly searched labor-related terms. Terms for pain management in labor included medical options (including the most common neuraxial, intravenous and inhaled options) and non-medical options (derived from three pregnancy and birth websites that offer templates for creating a birth plan^{8–10}).

The review was performed by the study investigators, both board-certified anesthesiologists. The terms evaluated included the following: [epidural], [“nitrous oxide” + labor], [fentanyl + labor], [remifentanyl + labor], [meperidine (or Demerol) + labor], [“natural birth” + “nonmedical birth”], [“water birth”], [hypnobirth], [“home birth”], [midwife –call + doula]. Where an input term includes a phrase in quotation marks, only results that contain the exact phrase and word order are included. The “+” command denotes “OR,” and results will include searches for either term.

Descriptive data from Google search, Google Trends, and Google AdWords Keyword Planner are presented. Percentages relative to total search volume are given. Graphical representations were produced from Google Trends and Excel (Microsoft Corp, Redmond, WA). Trend line with 95% confidence intervals was obtained for relative search volume graphed over time.

Results

Google searches for [epidural] are increasing over time (Fig. 1). The best fit trend line for relative search volume against time was linear with an increase in search volume of 4.1% per week [$R^2=0.53$, 95% CI 3.8 to 4.4]. The total number of Google searches in the United

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