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Evaluation of the Impact of COVID-19 on Internet Searches for Bariatric Surgery in United Kingdom

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Abstract

Aim: The COVID-19 pandemic has significantly decreased the provision of UK bariatric surgery. We hypothesised that Internet searches for bariatric surgery might have increased during COVID. This study evaluated the impact of COVID on Internet searches for bariatric surgery in the UK population.

Materials and methods: A Google Trends data search using search topics: 'gastric bypass surgery', 'sleeve gastrectomy' 'adjustable gastric band' and 'gastric balloon' was performed. Relative Search Volume (RSV) indices were reported from March 2017 to March 2022. Mean RSV pre-COVID (March 2017-March 2020) and during COVID (March 2020-March 2022) were compared. ANOVA was performed to determine the impact of COVID on RSV

Results: Pre-COVID, gastric bypass surgery was most searched, whilst during COVID, sleeve gastrectomy became most commonly searched. ANOVA analysis revealed a significant increase in searches during COVID for sleeve gastrectomy (20.4% pre-COVID *vs*. 47.2% during COVID; p<0.001), gastric bypass surgery (25.4% *vs*. 30.7%; p<0.001) and gastric balloon (8.4% *vs*. 12.0%; p<0.001) but not adjustable gastric band (38.7% *vs*. 37.8%; p=0.350).

Conclusion: During the pandemic there was a significant increase in Internet searches for bariatric surgery, likely reflecting lack of availability of bariatric surgery during this time.

Keywords: Bariatric and metabolic surgery; Google trend; Public perception; Relative search volume; COVID-19 and obesity

Introduction

The COVID-19 pandemic has negatively impacted every aspect of elective surgery provision, including bariatric surgery [1]. It has been postulated that obesity could be one of the pre-existing diseases associated with higher mortality from COVID [2]. In addition, obesity could shift severe COVID morbidity to younger ages [3]. Bariatric, or weight loss, surgery, has been shown to provide long-term reduction in weight and obesity-related disease in those having this treatment [4].

There is good evidence that public perceptions and overall awareness of bariatric surgery can be influenced positively or negatively by the media (print and online information). This in turn reflects on how and when patients with obesity seek medical intervention.

The Royal College of Surgeons of England has recently produced guidance regarding consent and shared, supported decision-making. As part of their recommended consenting process, they encourage surgeons to give patients time for reading online resources relating to treatment options and suggest that patient access suitable material (including written and online materials) prior to initial consultation. It is important that this information is of high quality and accessible to patients [5]. The Internet is often used by patients seeking information on bariatric surgery. However, the quality of information online is highly variable, and on average only of poor or fair quality [6].

In a systematic review performed to check online healthcare information relating to bariatric surgery, 20 websites (10 in the UK) were identified. These were assessed according to readability, content, quality, and standards of the accreditation. No single source has achieved the minimum recommended level [7]. Such resources require improvement to help the shared decision-making process.

Google Trends (GT) is a website sponsored by Google that analyses the popularity of most commonly searched queries across various regions and languages [8,9]. GT provides access to a largely unfiltered sample of actual search requests made to Google. It is anonymized (searching individuals not identified), categorized (determining the topic for a search query) and aggregated (grouped together). This allows the website to display interest in a particular topic at different scales ranging from local to global. GT normalizes search data to the time and location of a query in order to make comparisons between terms easier.

The Google Trends Data (GTD) reflects individual daily searches made on Google, and can be used to check the interest in each keyword. Carneiro and Mylonakis used the more generic GT tool to show that disease activity can be tracked [10]. GTD has been used recently to measure a variety of public interests around the world. GTD regarding bariatric surgery represent a specific trend and is increasingly being studied by healthcare providers.

Relative Search Volume (RSV) or relative popularity is the ratio of a query's search volume to the sum of the search volumes of all possible queries. The resulting numbers then get scaled on a range of 0 to 100 based on the proportion of the topic to all searches.

The aim of this study was to examine the impact of the COVID-19 pandemic on Internet searches of bariatric surgery, to include different types of bariatric surgery before and during the pandemic.

Materials and Methods

Potential search terms were identified by the authors using an exploratory method reported by Bramer, et al., using the most recent International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) Global Registry reports, the most common procedures were identified [11,12]. Internet search terms likely to be used for specific bariatric operations were explored, to include "Roux-en-Y gastric bypass", "One-anastomosis gastric bypass", "gastric bypass", "Sleeve gastrectomy", "gastric sleeve", "lap band", "gastric band" and "gastric balloon" (AC and RW). Initial searches indicated that some terms had limited yield on Google Trends; therefore, the list of terms was reduced to include the classic bariatric operations "gastric bypass", "gastric sleeve", "adjustable gastric band" and "gastric balloon". The RSV for each of these terms is used to compare the data generated from GTD within UK population before and after the pandemic.

Search criteria were entered into Google Trends to generate a graph of searches for the UK over time. A value of 100 represents peak search volume as a percentage, with values below this the corresponding percentage over time. Using the data generated by GT, a database was created for the interest volume for each search term from March 2017 to March 2022, and scatterplots were created. Each individual point represents perceived interest in a term for the corresponding month and year. Fitted spline polynomial trend lines approach was chosen to best fit the data over a range of data points. The impact of the COVID pandemic was assessed by comparing March 2017-March 2020 (pre-COVID) and March 2020-March 2022 (during COVID). Trend analyses were completed using Microsoft Excel Version 14.3.5 and SPSS v 25. ANOVA was used to compare Pre-COVID and during COVID search volumes. $P<0.05$ was considered to be statistically significant.

Results

In the pre-COVID era, adjustable gastric band was the most commonly searched for procedure (RSV=38.7%), followed by gastric bypass (RSV=25.4%), sleeve gastrectomy (RSV=20.4%) and then gastric balloon (RSV=8.5%). There was a notable seasonality effect, with an increase in interest in all procedures just prior to summer.

At the commencement of the COVID pandemic, there was a significant increase in relative search volumes (RSV) for all specific bariatric operations except for adjustable gastric band. The RSV for sleeve gastrectomy was (RSV=20.4% pre-COVID *vs*. 47.2% during COVID; $p<0.001$) followed by gastric bypass (25.4% pre-COVID *vs.* 30.7% during COVID; $p<0.001$) and gastric balloon (8.4% pre-COVID *vs.* 12.0% during COVID; $p<0.001$), but not for adjustable gastric band surgery (38.7% pre-COVID *vs.* 37.8% during COVID; $p=0.350$) (Table 1).

Table 1. Mean Relative Search Volume (RSV) for different bariatric surgery procedures comparing Pre-COVID and COVID periods.

Surgery	Pre-COVID (Mean (SD))	COVID (Mean (SD))	P value
Gastric bypass	25.4 (5.1)	30.7 (6.4)	<0.001
Sleeve gastrectomy	20.4 (4.4)	47.1 (19.7)	<0.001
Adjustable gastric band	38.7 (7.6)	37.8 (8.5)	0.35
Gastric balloon	8.5 (3.5)	12.0 (4.7)	<0.001

During COVID, sleeve gastrectomy searches substantially increased in RSV interest, such that it became the most commonly searched for bariatric surgery procedure (RSV=20.4% pre-COVID *vs.* 47.2% during COVID; $p<0.001$). Data from the GT search are shown Figure 1.

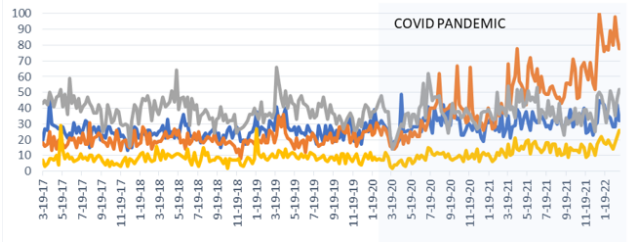

Figure 1. Relative search volumes (%) over time (every two months) for bariatric surgery procedures (March 2017-March 2022). **Note:** ( ) Gastric bypass surgery; ( ) Sleeve Gastrectomy; ( ) Adjustable gastric band; ( ) Gastric balloon.

Discussion

Using the GTD, we have explored the interest levels of the UK publication in bariatric surgery. We have used COVID-19 era as a comparable to assess variation in the interest among the UK population due to the COVID-19 pandemic. During the pandemic, there was a significant increase in the UK public online search for bariatric surgery compared to the pre-pandemic era. Also, there was a variation in the preference of the public for specific type of bariatric surgery, with a significant increase in searches for sleeve gastrectomy followed by laparoscopic gastric bypass surgery and endoscopic gastric balloon during the pandemic. Searches for adjustable gastric band surgery were reduced during COVID-19 compared to being the most searched term before the pandemic.

Sleeve gastrectomy is becoming more popular, possibly due to rapid weight loss, low rate of complications and relatively eases to perform. These results reflect the worldwide popularity of the sleeve gastrectomy but also reveal changes in the public interest in different bariatric procedures.

Rahiri, et al., used GT to explore the New Zealand public's interest in bariatric surgery between 2007 and 2017. This study also indicated increased interest in bariatric surgery especially sleeve gastrectomy [13]. Similarly, recent data from the US and Asia-Pacific Bariatric/Metabolic Surgery Survey (APMBSS) reflects the upward trend in sleeve gastrectomy. This is in contrary to the published UK National Bariatric Surgery Registry (NBSR) 2020 report that indicated Roux-en-Y Gastric Bypass (RYGB) (49%) followed by sleeve gastrectomy (35%) as the most common bariatric procedures performed in the UK [14].

Our findings reflect an interesting noticeable shift in the UK public interest in bariatric surgery when looking for the online advertised treatment options. However, it is not known whether this reflects a genuine interest in finding a suitable treatment option for those who are living with obesity, or if it is indicates increased viewing of the internet including a general interest in online bariatric advertisements [15].

To our knowledge, our study is the first study to assess changes in the public interest in bariatric surgery, while internet searching before and during the COVID-19 pandemic.

However, these results should be analysed carefully when considering treatment options with patients during consultations. It is rather important to be aware of this media effect on patient's choice of their preferred bariatric procedure and that the final decision should be based on a mutual agreement, based on a clinician evidence and patients' needs rather than a biased choice based on unaccredited advertisements and untrusted websites [16,17]. Hence, heath organisations, stakeholder and healthcare professionals need to provide trustworthy information on the internet in the form of accredited websites, information leaflets and continuous public education.

Conclusion

The use of Google Trends may provide us with an additional tool to evaluate public interest levels related to bariatric surgery and the popularity of a specific type of bariatric surgery over others. During COVID-19 pandemic, Google Trends insights have helped us understanding the change in users' behaviour which poses new challenges to stakeholders. UK weight management services need to provide accessible, relevant, heavily supervised, and reliable online public information regarding bariatric and metabolic surgery.

Limitations of the Study

This study has limitations. Firstly, our study is dependent on the search topic construction developed by Google and some terms that were of clinical interest may have been excluded. Secondly, Google is only one search engine and other search engines may not have generated the same findings. However, it is ubiquitous and other studies have demonstrated the validity of using Google Trends as a representation of public interest. Also, Relative Search Volume produces percentage data rather than the actual number of searches, therefore research volumes cannot be inferred. Finally, Google has significant demographic bias, with less use in older and socially disadvantaged groups, and these findings may not reflect their interest.

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