



# An Analysis of Publications on Cervical Plexus Blocks

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## Abstract

Bibliometric analysis provides measures of the quality and quantity of researches undertaken by departments/individuals and indicates countries' contribution toward scientific development. The aim of this bibliometric study is to analyze scientific publications on cervical plexus blocks. Institute for Scientific Information (ISI)/Web of Knowledge Science was used for the analysis. A retrospective search was performed using the terms “cervical plexus block (CPB),” “superficial-CPB,” “intermediate-CPB,” “deep-CPB,” “regional anesthesia in CPB,” and “loco-regional anesthesia in CPB”. We further analyzed these results by the “analyze” function of the software in terms of number of papers from each country, type of documentation, number of publications per year, name of journals, and authors. The number of citations to published works was also calculated by using the citation function of the same software. Two hundred sixty papers were found related to cervical plexus block. The biggest contribution was from the USA (14.61%). The acceleration of the publications began in 2004. But there were three sharp declines in 2007, 2014, and 2016, respectively, after the acceleration in publications. CPBs were most frequently employed for carotid endarterectomy. Other indications for CPB application were otoplasty, thyroid, and parathyroid surgery (for analgesia and/or anesthesia) and recently perioperative analgesia during cervical spine surgery; but the number of publications on these topics is very limited.

**Keywords** Cervical plexus block · Bibliometric analysis · Regional anesthesia

## Abbreviations

ISI	Institute for Scientific Information
CPB	Cervical plexus block
USA	United States of America
WoS	Web of Science™ Core Collection
SCI-E	Science Citation Index Expanded
UK	United Kingdom
CAS	Carotid artery stenosis

## Introduction

Scientometrics is a discipline that measures and analyzes scientific reports quantitatively, often by using bibliometric

analysis in practice [1]. Bibliometric analysis provides measures of the quality and quantity of researches undertaken by departments and/or individuals and also indicates countries' contribution toward scientific development [1, 2]. There are multiple options (Scopus, Google Scholar, Harzing's Publish or Perish, Scholarometer, PubMed) available for bibliometric web searches [2]. The introduction of the Science Citation Index in 1961 as a tool for bibliographic retrieval allowed qualitative evaluation of published work [1, 3].

We used Thomson Reuters Web of Science™ Core Collection (WoS), which is a software application included Science Citation Index Expanded journals from 1975 to date for this study [2, 4]. To our knowledge, this is the first bibliometric study in the scientific area of cervical plexus blocks (CPBs).

## Materials and Methods

This study was conducted on March 10, 2019, using the WoS software to analyze cervical plexus block publications included in Science Citation Index Expanded (SCI-E). We searched all papers in the area of CPBs published between 1975 and March 10, 2019, using the terms “cervical plexus block,”

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“superficial cervical plexus block,” “intermediate cervical plexus block,” “deep cervical plexus block,” “regional anesthesia in cervical plexus block,” and “loco-regional anesthesia in cervical plexus block” in the topic search section of the software. Then using the “analyze” function of WoS, we analyzed the number of publications for each country, author, categories, languages, journals, publication years, and the types of the documentations. The number of citations was also calculated by using the citation function of the same software.

## Results

Overall, 260 papers were published in cervical plexus block and were included in SCI-E between 1975 and March 10, 2019.

In this period, the biggest contribution was from the USA ( $n = 38$ ), followed by Germany ( $n = 26$ ), England ( $n = 25$ ), Italy ( $n = 20$ ), France ( $n = 17$ ), Turkey ( $n = 17$ ), and the People’s Republic of China (PRC) ( $n = 13$ ). Other countries’ number of publications were under 13 (<5%) (Fig. 1).

The first study was published on CPBs in 1990. This report was an article, published by MJ Davies from Australia on carotid endarterectomies using CPBs. There was no significant increase in the number of publications until 2000. There was no publication in 2000 and 2001. The acceleration of the publications began in 2004. But there were three sharp declines in 2007, 2014, and 2016, respectively, after the acceleration in publications (Fig. 2).

The types of publications were articles (74.23%), followed by letters (10.38%), meeting abstracts (6.92%), and reviews (5.76%) (Table 1). Publications were dominantly in English (91.53%), then in German (5.00%), French (1.53%), Czech (1.15%), Italian (0.38%), and Turkish (0.38%).

Regarding authors’ contributions, MD Stoneham (3.46%) was ranked first, MJ Davies (3.07%) was ranked second, JJ Pandit (2.30%) and BS Silbert (2.30%) shared third, and EJ Castresana, MR Castresana, DA Scott, and H Ueshima

(1.92%) shared fourth row in the list (Table 2). Other authors’ publication counts were under 5.

For those 260 publications, the sum of total citations during this time period was 2432 (1360 without self-citations), and the citation-to-work ratio was 9.35 with h-index of 25. The first citation was in 1991, and the number of citations fluctuated over the subsequent years (Fig. 3).

Anesthesiology (64.6%), surgery (13.4%), medicine general and internal (8.0%), peripheral vascular disease (8.0%), critical care medicine (7.3%), and cardiac and cardiovascular systems (5.7%) published that involved cervical plexus blocks. Other web of science categories’ percentages of contribution were under 5%.

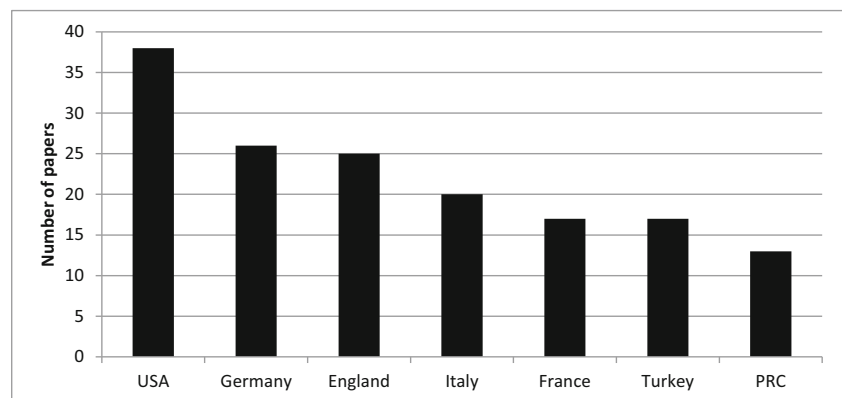
Journals that published over 5 papers were *Anesthesia and Analgesia* ( $n = 27$ ), *British Journal of Anesthesia* ( $n = 16$ ), *Journal of Cardiothoracic and Vascular Anesthesia* ( $n = 11$ ), *Regional Anesthesia And Pain Medicine* ( $n = 11$ ), *Journal Of Clinical Anesthesia* ( $n = 10$ ), *Anesthesia* ( $n = 9$ ), *Anesthesia and Intensive Care* ( $n = 7$ ), *Anaesthetist* ( $n = 7$ ), *Anesthesiology* ( $n = 7$ ), and *Minerva Anesthesiologica* ( $n = 6$ ).

## Discussion

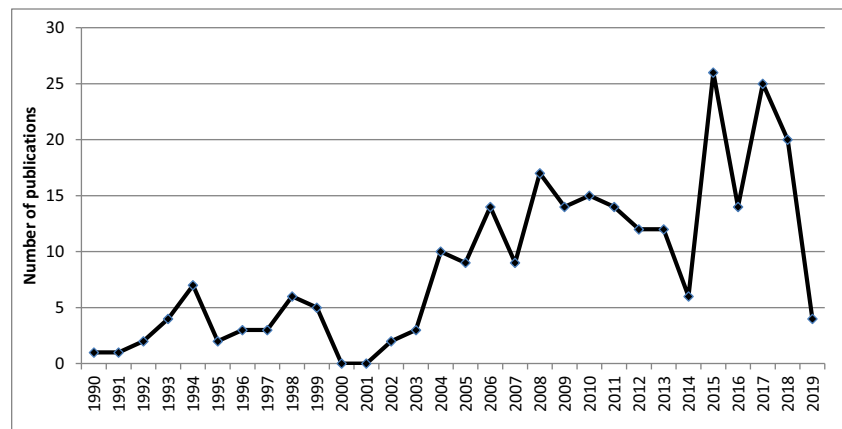
Halsted is credited with performing the first CPB in New York in 1884 [5]. CPBs for surgical anesthesia were first described by Kappis in Germany in 1912 using the posterior approach and by Heidenhein in 1914 using a lateral approach [5, 6]. These techniques gained popularity in France with Pauchet and in the USA with Labat [5]. CPBs were traditionally classified as superficial and deep blocks until Telford and Stoneham identified the intermediate cervical plexus block in 2004 [7–10].

CPBs can be used to provide anesthesia for a variety of surgical procedures, including superficial operations on the neck and shoulders, thyroid operations, and carotid endarterectomies [5–7]. Although the first successful carotid endarterectomy was performed by De Bakey in 1953 [11], the first report was published by Eastcott in 1954 [6, 8, 11]. CPBs were

**Fig. 1** Number of papers published in journals included in Science Citation Index Expanded according to countries, between 1975 and March 10, 2019, in the field of cervical plexus block



**Fig. 2** Number of papers published in journals included in Science Citation Index Expanded according to years in the field of cervical plexus block



used in anesthesia management for carotid endarterectomy by Rainer et al. in 1966<sup>11</sup> and for surgery of the thyroid gland by Aimala et al. in 1970 [12].

Carotid surgery is the most commonly used surgical procedure for CPBs. Publications suggest that “awake” patient is the “gold standard” of cerebral function monitoring in carotid endarterectomy. None of the cerebral function monitoring tests to evaluate the cerebral function, such as stump pressure, somatosensory evoked potential, transcranial Doppler ultrasound, electroencephalography, near-infrared spectroscopy, jugular venous oxygen, and cerebral oximetry, performed under general anesthesia during a carotid endarterectomy is better than the awake patient’s cerebral function evaluation [8]. In addition, cervical plexus blocks in carotid endarterectomy have many advantages as lower shunt insertion rate, lower cost, shorter hospital stay, lower morbidity, and mortality [8].

Although the biggest contribution for the publications on cervical plexus blocks was from the USA, the authors from the UK were the most frequent contributors. While authors from the USA contribute to the literature with articles, authors from the UK contribute to the literature with reviews.

Stroke is the first cause of disability and third leading cause of death among adults in the USA. Carotid artery stenosis

(CAS) caused by atherosclerotic plaques is the main cause of stroke. In the 1970s and 1980s, carotid endarterectomy was the most frequent surgery employed for CAS [11].

Other indication areas of CPB in the literature were otoplasty, thyroid and parathyroid surgery (for analgesia and/or anesthesia), and perioperative analgesia during cervical spine surgery.

The limitations of this study are as follows:

1. By the use of WoS database, we could not obtain the article(s) about cervical plexus blocks included in SCI-E published before 1975. The implementation of CPB was first in the 1900s. Although the definition is so past, the first publication in the WOS program was in 1990.
2. Some of the articles of 2018 and 2019 may not have been processed yet into the WoS system. Therefore, it may not be appropriate to make a clear comment for the publications on these recent years.

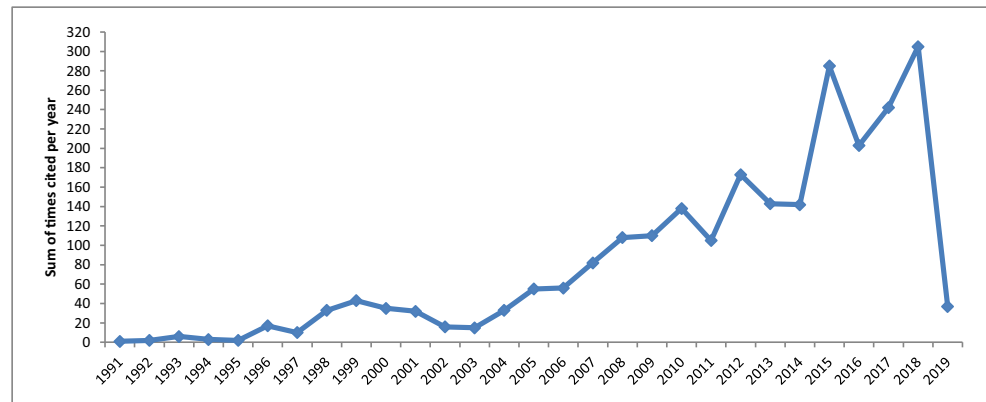
In conclusion bibliometric studies show the scientific interest by evaluating the quantity of published papers. With this study, we have detected that research papers on CPB were less than we expected in the literature, because first CPBs’

**Table 1** Distribution in the types of papers published included in Science Citation Index Expanded, between 1975 to 2019 in the field of cervical plexus block

Document type	<i>n</i>	Percentage (%)
Article	193	74.23%
Letter	27	10.38%
Meeting abstracts	18	6.92%
Review	15	5.76%
Proceedings papers	11	4.32%
Editorial material	4	1.53%
Note	1	0.38%

**Table 2** Distribution of authors ranked by the number of publications, who published over 5 publications, included in Science Citation Index Expanded, between 1975 to 2019 in the field of cervical plexus block

Author	<i>n</i>	Percentage (%)
Stoneham MD	9	3.46%
Davies MJ	8	3.07%
Pandit JJ	6	2.30%
Silbert BS	6	2.30%
Castresana EJ	5	1.92%
Castresana MR	5	1.92%
Scott DA	5	1.92%
Ueshima H	5	1.92%

**Fig. 3** Number of citations

application for carotid endarterectomy was in 1966, for thyroid gland surgery was in 1970, and applications for analgesia was in the 1950s. The most frequently used area for CPBs is carotid endarterectomy. The number of papers on other indications is very limited.

**Authors' Contribution** All authors made substantial contribution to the concept or design of the work and acquisition, analysis, or interpretation of data; drafted the article or revised it critically for important intellectual content; and approved the version to be published. All authors have read and approved the submitted version of the manuscript.

## References

- Mowaf HA (2012) Bibliometric analysis of the volume and visibility of Saudi publications in leading anesthesia journals. *Saudi J Anaesth* 6(4):393–397
- Moppett IK, Hardman JG (2011) Bibliometrics of anaesthesia researchers in the UK. *Br J Anaesth* 107(3):351–356
- Bas K, Derici S, Arkan T, Yener S, Atila K (2016) Global practice vs. research on bariatric surgery over the last decade. *Clin Surg Gen Surg* 1:1–7
- Yılmaz HO, Babazade R, Turan OA, Babazade B, Koyuncu O, Turan A (2017) Scientific publication performance of Turkish anaesthesia clinics in high impact factor international journals between 2005 and 2014: a bibliometric analysis. *Turk J Anaesthesiol Reanim* 45:16–25
- Waldmann SD (2007) Pain management. John L.PappasCarol A.Warfield. chapter 141 - Cervical Plexus Block. 2:1173–1190
- Hadzic A (2017) Hadzic's Textbook of Regional Anesthesia and Acute Pain Management, 2e. In: Vloka JD, Smeets AS, Tsai T, Bouts C (eds) Chapter 80A: Cervical Plexus Block, pp 1289–1297
- Kim JS, Ko JS, Bang S, Kim H, Lee SY (2018) Cervical plexus block. *Korean J Anesthesiol* 71(4):274–288
- Yılmaz F (2019) Anesthesia management for carotid endarterectomy: review article. *EJCM* 7(2):50–59
- Yılmaz F, Bas K, Ulugolge B (2019) Letter to editor: a request for a clarification about classification and nomenclature of cervical plexus blocks. *Ann Med Res* 26(5):966–967
- Rainer WG, McCrory CB, Feiler EM (1966) Surgery on the carotid artery with cervical block anesthesia. Technical considerations. *Am J Surg* 112(5):703–705
- Saha SP, Saha S, Vyas KS (2015) Carotid endarterectomy: current concepts and practice patterns. *Int J Angiol* 24(3):223–235
- Aimale F, Truffelli L (1970) Cervical plexus block in surgery of the thyroid gland. *Minerva Anesthesiol* 36(11):717–719

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