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# Representation of South Asian countries in five high-impact anesthesia journals

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## Original Article

# Representation of South Asian countries in five high-impact anesthesia journals

### ABSTRACT

**Context:** The South Asian region is comprised of eight countries, i.e., Pakistan, India, Bangladesh, Sri Lanka, Afghanistan, Bhutan, Nepal, and Maldives. There is dearth of literature documenting anesthesia research in this region.

**Aim:** The aim of this audit was to look at research productivity in the region by examining the volume and the type of anesthesia publication in five high-index anesthesia journals.

**Settings and Design:** The study design was a survey of literature in the top five high-impact anesthesiology journals carried out at a tertiary care hospital.

**Materials and Methods:** The journal citation report 2016 was accessed to identify the top five anesthesia journals based on their impact factor. We identified articles published in these journals between January 2000 and December 2015.

**Statistical Analysis:** Microsoft Excel 2003 worksheet was used for data collection from extracted articles.

**Results:** The highest number of publications came from India ( $n = 487$ ) 95.9%; 58.5% of these were correspondence, 21% were original articles, 12.8% were case reports and case series, 1.2% reviews, and 1% editorials. Fourteen articles were published from Pakistan, with 1.2% original articles, 0.8% letter to editor, 0.6% audits, and 0.2% case reports. Nepal and Sri Lanka contributed seven publications. There were no publications in these journals from authors from Bangladesh, Afghanistan, Bhutan, and Maldives in the reviewed journals. The highest number of publications was equally distributed between two journals, i.e., "Anesthesia and Analgesia" (29.5%) and "Anesthesia" (28.9%).

**Conclusion:** We found that scientific contributions from the South Asian region in terms of original anesthesiology research in five high index anesthesiology journals was suboptimal and has not shown an increasing trend over the last 16 years.

**Key words:** Anesthesiology journals; high impact; research; South Asian countries

## Introduction

Enhancement of patient safety is related to evidence produced by medical research. Like other medical specialties, this holds true for anesthesia. Publication of original research in a high-quality journal may reflect the creation of new knowledge and may be used as a tool to measure research productivity.<sup>[1]</sup>

The South Asian region is comprised of eight countries, i.e., Pakistan, India, Bangladesh, Sri Lanka, Afghanistan, Bhutan, Nepal, and Maldives. It represents nearly 21% of the world population and has a mix of both middle- and low-income countries.<sup>[2]</sup> Several of the problems relating to anesthesia services are common to the region. There is dearth of published literature documenting anesthesia research in

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this region. An attempt was made by Kapor *et al.* to quantify the contribution of Indian authors only in seven high indexed anesthesia journals and the authors pointed out the small contribution made by Indian authors.<sup>[3]</sup>

The aim of this audit was to look at the trend of research productivity in the region by examining the volume and the type of anesthesia publication in five high index anesthesia journals over a 16 years period

## Materials and Methods

The study design was a survey of literature in the top five high-impact anesthesiology journals and did not require the Institutional Ethical Review board approval. The journal citation report (JCR) 2016 was accessed to identify the top five anesthesia journals based on their impact factor.<sup>[4]</sup> Pain and subspecialty anesthesia journals were excluded from the list. A computerized search was conducted between December 20, 2016, and March 20, 2017 for articles published from these eight South Asian countries over a 16 years period, January 2000 until December 2015.

Each journal website was accessed and the name of the country was used as a search term to identify articles published from these countries between 2000 and 2015. Only papers where the first or the corresponding author's affiliation was from any of the eight South Asian countries were included in this study. The following data were captured on a specially designed Excel sheet; name of journal, year of publication, departmental affiliation of authors, country of publication, title of article, publication subspecialty, type of publication and collaborative publications with high-income countries (HIC).

The type of publication was further categorized as original articles (randomized controlled trails [RCTs], observational studies, laboratory, and animal studies), reviews (narrative and systematic), editorials, audits, correspondence/letters to editor/e-letters, and case reports or case series. If the article did not fit in any of these categories, the publication was characterized as miscellaneous. Articles where the authorship was shared with authors from HIC were also included if the first or the corresponding author was from one of the South Asian countries.

If the paper listed more than one institution, the institutional affiliation of the first author was taken.

Abstracts of meetings, book reviews, and retracted articles were excluded.

## Statistical analysis

Microsoft Excel 2003 worksheet was used for data collection from extracted articles. As this information was descriptive and categorical only frequency and percentage were analyzed and reported for the following categories; type of publication, country of origin of publication, year wise distribution of the published articles, journal of publication, and collaborative publications with HIC.

## Results

According to JCR 2016, the five journals with highest impact factor were identified as British Journal of anesthesia, Anesthesiology, Anesthesia and Analgesia, Anesthesia, and European Journal of anesthesia. The impact factor of these journals ranged from 3.634 to 5.616. (European Journal of anesthesia 3.634, Anesthesia 3.794, Anesthesia and Analgesia 3.827, Anesthesiology 5.264, and British Journal of anesthesia 5.616).<sup>[4]</sup>

The total number of publications retrieved from the South Asian countries between 2000 and 2015 was 508. The distribution according to the type of articles is given in Table 1. Approximately sixty percent of the publications were correspondence/letters to editor or e-letters (59.8%).

Table 1 also shows the distribution of publications between three time periods, i.e., 2000–2005, 2006–2010, and 2011–2015. No significant difference was seen between these periods 2000–2005 (32.4% publications), 2006–2010 (43.7% publications), and 2011–2015 (23.8% publications).

Table 2 shows the number of articles according to country of publication and the distribution over the study period. The highest number of publications came from India ( $n = 487$ ) 95.9%; 58.5% of these were correspondence, 21.3% were original articles and 12.8% were case reports and case series, 1.2% reviews, and 1% editorials. Fourteen articles were published from Pakistan, with 1.2% original articles, 0.8% letter to editor, 0.6% audits, and 0.2% case reports.

The other seven articles were from Nepal ( $n = 6$ ) and Sri Lanka ( $n = 1$ ). There were no publications authored by local scientists from Afghanistan, Bhutan, Maldives, or Bangladesh, during the identified period.

Table 3 shows the distribution of articles in the five different high-impact anesthesia journals. The highest numbers of publications were equally distributed between the journals "Anesthesia and Analgesia" (29.5%) and "Anesthesia" (28.9%).

**Table 1: Number of publications according to type of document (n=508)**

| Type of publication                        | n   | Percentage | Year of publications |                      |                      |
|--|-----|------------|----------------------|----------------------|----------------------|
|  |     |            | 2000 to 2005 (n=165) | 2006 to 2010 (n=222) | 2011 to 2015 (n=121) |
| Original articles                          | 115 | 22.6       | 34                   | 60                   | 21                   |
| RCT  | 98  | 19.3       | 29                   | 51                   | 18                   |
| Observational study                        | 15  | 3.0        | 5                    | 8                    | 2                    |
| Laboratory or animal study                 | 2   | 0.4        | 0                    | 1                    | 1                    |
| Review articles                            | 7   | 1.4        | 1                    | 1                    | 5                    |
| Narrative                                  | 1   | 0.2        | 1                    | 0                    | 0                    |
| Systematic review and meta-analysis        | 6   | 1.2        | 0                    | 1                    | 5                    |
| Audits                                     | 8   | 1.6        | 5                    | 3                    | 0                    |
| Editorials                                 | 5   | 1.0        | 3                    | 2                    | 0                    |
| Case reports/series                        | 68  | 13.4       | 31                   | 19                   | 18                   |
| Case reports                               | 64  | 12.6       | 30                   | 17                   | 17                   |
| Case series                                | 4   | 0.8        | 1                    | 2                    | 1                    |
| Technical communication                    | 1   | 0.2        | 0                    | 0                    | 1                    |
| Letters to editor/correspondence/E-letters | 304 | 59.8       | 91                   | 137                  | 76                   |

RCT: Randomized controlled trial

**Table 2: Number of publications in high impact anesthesia journals with respect to origin (n=508)**

| Type of documents (n=508)                  | n   | Origin of publications |                 |               |
|--|-----|------------------------|-----------------|---------------|
|  |     | India (n=487)          | Pakistan (n=14) | *Others (n=7) |
| Original articles                          | 115 | 108 (21.3%)            | 6 (1.2%)        | 1 (0.2%)      |
| RCT  | 98  | 94                     | 3               | 1             |
| Observational Study                        | 15  | 11                     | 3               | 1             |
| Animal Study                               | 2   | 2                      | -               | -             |
| Review articles                            | 7   | 6 (1.2%)               | -               | 1 (0.2%)      |
| Narrative                                  | 1   | 1                      | -               | -             |
| Systematic review and meta-analysis        | 6   | 5                      | -               | 1             |
| Editorials                                 | 5   | 5 (1%)                 | 0 (0%)          | 0 (0%)        |
| Letters to editor/correspondence/E-letters | 304 | 297 (58.5%)            | 4 (0.8%)        | 3 (0.6%)      |
| Case report/series                         | 68  | 65 (12.8%)             | 1 (0.2%)        | 2 (0.4%)      |
| Case report                                | 64  | 61                     | 1               | 2             |
| Case series                                | 04  | 4                      | -               | -             |
| Audit                                      | 8   | 5 (0.1%)               | 3 (0.6%)        | 0 (0%)        |
| Technical communication                    | 1   | 1 (0.2%)               | 0               | 0             |

All percentages were computed by 508. \*Others: Nepal (6) Sri Lanka (1)

**Table 3: Number of publications in high impact anesthesia journals with respect to country of origin (n=508)**

| Country of origin of publication | Total | Journal             |                       |                                  |            |            |
|----------------------------------|-------|---------------------|-----------------------|----------------------------------|------------|------------|
|                                  |       | Anaesthesia (n=147) | Anesthesiology (n=39) | Anesthesia and Analgesia (n=150) | BJA (n=88) | EJA (n=84) |
| India                            | 487   | 136                 | 38                    | 148                              | 83         | 82         |
| Pakistan                         | 14    | 9                   | 1                     | 0                                | 2          | 2          |
| Nepal                            | 6     | 1                   | 0                     | 2                                | 3          | 0          |
| Sri Lanka                        | 1     | 1                   | 0                     | 0                                | 0          | 0          |

There were only 22.6% (n = 115) randomized clinical trials, observational, and animal studies published from this region, mainly from India. Thirty-nine percent of these articles related to pain, drug-related research or regional anesthesia, the rest were on miscellaneous topics covering pediatric, obstetric, neuroanesthesia, ambulatory anesthesia, etc.

There were five collaborative studies with HIC and two collaborative editorials. Out of the five studies, two were RCT's, two observational, and one animal study. Three of these were undertaken in collaboration with the United States of America (USA) institution, one with an Australian institution and one was with a pharmaceutical company in the USA.

## Discussion

This survey shows that the volume of anesthesia publication from South Asia in five leading anesthesia journals was 508 with nearly 60% correspondence and only 22.6% original research. The highest contribution was from India. What our survey highlights are the poor contribution of South Asian countries to the original research published in five high-impact journals.

The eight countries represent a mix of low- and middle-income countries (LMIC) with six middle and two low-income countries. A highly significant relationship has been seen between a country's economy and its capacity to generate quality research.<sup>[1]</sup> However, the information regarding the scientific spending on research in these countries was not available to us, and may be different in different countries.

Papers at global level have previously looked at the geographical source of publications in anesthesiology in other regions.<sup>[5,6]</sup> In 2003, Figneredo *et al.* looked at the source country of 10 anesthesia journal articles between 1997 and 2001 indexed in Medline. From the South Asia region, only 0.85% of the articles were from India and 0.05% from Pakistan. Sri Lanka published two and Bangladesh and Nepal one each. There was no contribution from the other three countries.

Bould in 2010, analyzed 9684 articles published in 18 anesthesia journals between 2007 and 2008 and quantified national contribution.<sup>[1]</sup> India was the only South Asian country included. It produced 71 (1.7% of total) articles.

Li *et al.* in 2011 conducted a 10-year survey 2000–2009 and published data from top 20 countries. The only South Asian country listed was India with 522 papers and 19<sup>th</sup> position on the list.<sup>[6]</sup> Chen *et al.* have recently made an attempt to look at the trends of anesthesiology publications from 1995 to 2014.<sup>[7]</sup> More than 45% of the 64,199 articles were published by the five journals we studied. The majority of the articles originated from the USA and Europe.

In recent years attempts have also been made to identify the scientific publishing in anesthesiology from East Asia, and from Saudi Arabia.<sup>[8-10]</sup> As regards South Asia only one previous letter to editor in an Indian journal has attempted to quantify research from India in high-impact journals.<sup>[3]</sup> To the best of our knowledge, this is the first attempt to do so from the South Asian region.

An analysis of biomedical publications from 1985 to 2009 showed that South Asian Association for Regional Cooperation (SAARC) countries contributed to only 1.1% of

the total PubMed publications.<sup>[11]</sup> Swaminathan *et al.* examined clinical anesthesia research not limited to anesthesiology journals through Medline search from 2000 to 2005. Both India and Pakistan had 0.1 publications/million population in contrast to the USA 4.3/million, United Kingdom 7.8/million and Turkey 4.6/million.<sup>[12]</sup>

The reasons for poor contribution to research from South Asia could be several and may be similar to what has been highlighted in other specialties apart from anesthesia.<sup>[13]</sup> Problems that hinder research in anesthesia in developing countries have been identified by some authors. Factors that have been identified are lack of research training, lack of basic infrastructure, lack of incentive, poor access to literature, poor presentation in English, and bias of journals.<sup>[14,15]</sup> A 2004 study of the National Science Foundation found that scientific articles by Latin American authors tripled between 1988 and 2001 due to an increase in national public funding of research.<sup>[16]</sup> Poor participation in publication-related decision-making has also been identified as a factor.<sup>[13]</sup> It was not the purpose of this survey to identify these factors. There was also lack of collaborative studies with HIC. Only five studies and two editorials were identified where a South Asian institution had collaborated with an institution or a pharmaceutical company in HIC. This is an area, which can be used for improving research capacity in LMIC countries. Such collaboration in other areas such as cancer-related research has helped in building infrastructure as well as providing opportunities to establish translational and clinical research.<sup>[17]</sup> In addition, no collaborative research between the countries of the South Asian region was identified. These countries face similar challenges and it would be useful to do multicenter trials in the region. Problems that might be hindering collaborative research among the SAARC countries may be lack of focus on research due to shortage of anesthesia personal that are more focused on service delivery. Other factors are lack of research training, poor research culture, and no emphasis on research data collection in national policies. The recent World Federation of Society of Anesthesiologists workforce survey highlighted the issue of lack of human resource in this region.<sup>[18]</sup> Seventy-seven countries reported a physician anesthesia provider density of less than five, with particularly low densities in the African and South-East Asia regions. Discussing common issues at regional meetings is important and could lead to collaborative research.

The reason for maximum contribution of the SAARC countries publications in the journals of Anesthesiology and Anesthesia and Analgesia might be due to author's preference or the journal preference to encourage research from LMIC.

There are certain limitations to our survey. Our strategy was only applied to high-impact anesthesiology journal

publications in English only. The impact factor of these journals was only applicable to the year 2016 and may not have reflected the top five journals over 16 years. We did not include specialty journals dealing with pain, critical care, cardiac anesthesia, pediatrics anesthesia, etc., thus the articles that were published in these journals were not captured. A broader selection may have increased the percentage of contribution. Similarly, articles on anesthesia that may have appeared in nonanesthesiology journals may have been missed. There are at least six regional anesthesia journals published from the region, none of these journals have an index of more than two and were not included in our search. Therefore, our survey's methodology might have underestimated the research output from the targeted eight countries.

Classification of articles was not possible to be absolutely objective. We tried to overcome this using two reviewers. We also did not look at the quality of individual articles or the citation index, which may judge the significance of research more accurately. However, it is understood that quality is maintained by the peer review process of these high-impact journals chosen.<sup>[19,20]</sup>

We did not look at the clinical relevance of these studies to LIMC either. We feel that our survey despite these limitations has highlighted the trends of research publications in South Asia. It is the time that these research-related issues are actively discussed in the regional meetings.

## Conclusion

We found that scientific contributions from the South Asian region in terms of original anesthesiology research in five high index anesthesiology journals identified by JCR 2016 were suboptimal. It has not shown an increasing trend over the last 16 years.

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## Conflicts of interest

There are no conflicts of interest.

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