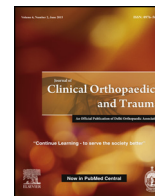




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Full length article

India contribution to Spine Surgery: 15 most influential articles

Bhavuk Garg, Sahil Batra*, Vivek Dixit

Department of Orthopaedics, All India Institute of Medical Sciences, New Delhi, 110029, India

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ABSTRACT

Objective: To determine the number of articles published by Indian authors related to spine surgery and to enumerate the 15 most influential articles from India published in the field of spine surgery in national & international journals based on the citations they have received both in pubmed and google scholar.

Material and methods: A retrospective study using Pubmed database was performed for the years between 1960 and 2015, for the articles published from India in the field of spine surgery in various national and international journals. A total of 3181 citations were received for top 15 most influential articles in the field of spine surgery from India.

Results: A total of 885 papers from India were identified which were published by Indian authors related to spine surgery between year 1960 to 2015. The largest numbers of papers were published in International journals such as Spine (82) and in European Spine Journal (47).

Conclusion: There are an increasing number of papers from India in the field of spine surgery literature. Most of the highly cited papers were related to tuberculosis. We expect further contributions from our country to the medical literature in the future.

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1. Introduction

There has been tremendous advancement in the orthopaedics in the last 50 years especially in the field of spinal surgery, and in turn, an increase in the number of spine-related studies. These studies are published in older and relatively new spine related journals, including Asian Spine journal, European Spine Journal, the Spine Journal, and the most rated orthopaedic Journals such as JBJS and CORR. There are many other journals apart from these journals which publish such studies. However, the contribution of India to spine surgery literature is not known. The aim of this study was to determine the number of spine-related publications written by Indian authors over last 60 years and to highlight the top 15 most influential articles based on their citations.

2. Materials and methods

A Retrospective study using PubMed database was performed for the years between 1960 and 2015 for the literature in the field of spine surgery in various national and international journals. Various Keywords were used to identify articles published by Indian authors related to spine surgery such as spine, scoliosis, tuberculosis, tumor, cervical spine, dorsal/thoracic spine, lumbar

spine, surgery, cord. Two authors (SB) and (VD) independently reviewed all the articles and in case of any disagreement; senior author (BG) was consulted. We checked for the institution where the study was being conducted and included studies of India origin.

After determining the titles of papers originating from India, these articles were analysed in detail with the following aims: 1. Determine the number of spine-related publications written by Indian authors over last 60 years. 2. Determine the distribution in various spine sub-specialities, and 3. Determine the citations received by the publications both in the Pubmed and Google scholar.^{16–18} Google scholar also includes the citations of Scopus.

3. Results

There were a total of 885 papers from India in field of spine surgery between (1960–2015). The number of publications has increased over the time (Fig. 1) and it has been seen there is increase in the publications in the international Journals over last few years (Fig. 2).

1. The largest numbers of papers were published in Spine (82) and in European Spine Journal (47) (Table 1).
2. Contribution of different states to the spine surgery literature (Table 2).
3. Majority of the papers were found to be either on infection or scoliosis. A total of 180 and 76 articles were related to infection and scoliosis respectively (Fig. 3).

* Corresponding author.

E-mail address: sahilbatra25@gmail.com (S. Batra).

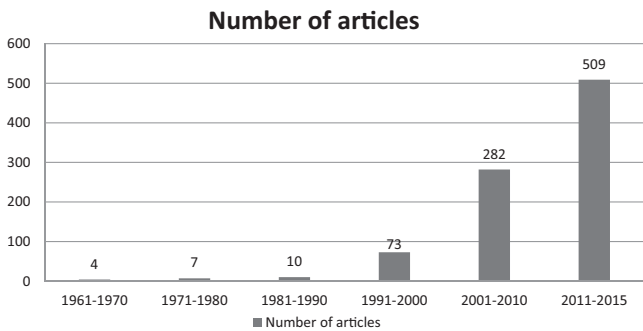


Fig. 1. Number of articles published over period of time.

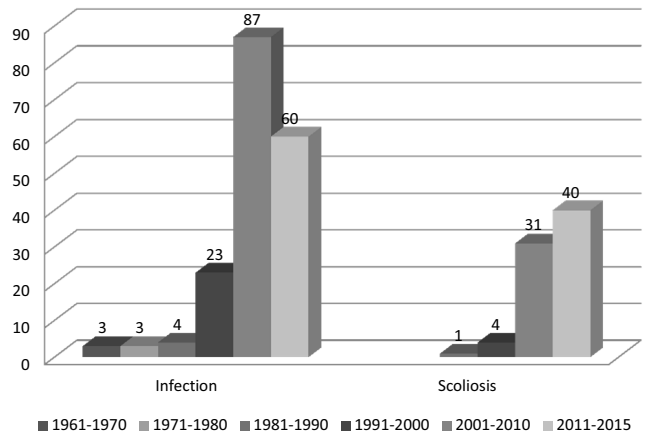


Fig. 3. Distribution of infection and scoliosis publications over period of time.

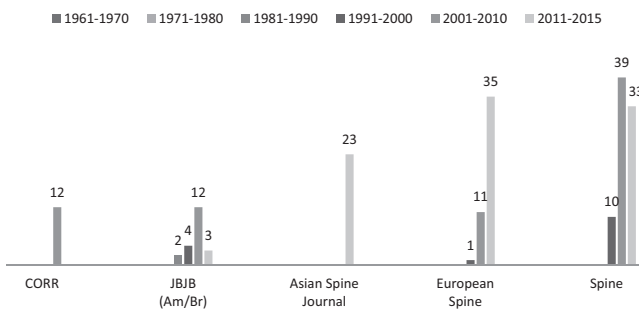


Fig. 2. Articles published in various journals over period of time.

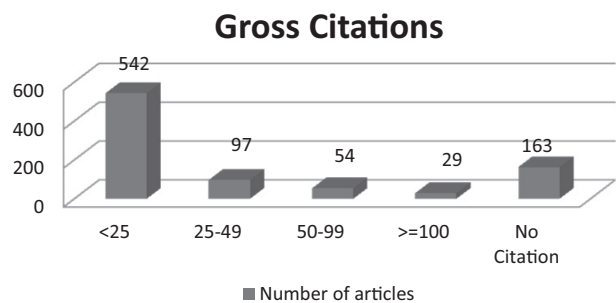


Fig. 4. Number of publication with different citations.

Table 1
Distribution of Publications in various journals.

Journals	Number of publications
The Spine	82
European Spine	47
Asian Spine Journal	23
JBJS(Am +Br)	21
CORR	15
Other journals	697

4. The gross citations (Pubmed + Google scholar)^{16,17} received by the publications were divided into four categories: <25, between 25 and 49, 50–99 and >100 citations (Fig. 4).

Table 2
State Wise contributions to spine related publications.

S.No.	State	Contribution
1.	Maharashtra	172
2.	Tamilnadu	159
3.	New Delhi	159
4.	Karnataka	75
5.	Uttar Pradesh	72
6.	Andhra Pradesh	32
7.	Kerla	21
8.	West Bengal	16
9.	Gujrat	16
10.	Madhya Pradesh	12
11.	Punjab	10
12.	Rajasthan	08
13.	Orrisa	06
14.	Rest States	127

4. Discussion

There has been tremendous increase in the number of publications especially over last decade. So we would like to enumerate top 15 most influential articles based on the citations followed by brief description about these articles (Table 3).

5. Highlights and brief description of the articles

1. The first article (Rajasekaran S., 1989)¹ is based on the progression of kyphosis in tuberculosis of the spine in patients treated by anterior arthrodesis. 81 patients who had tuberculosis of the spine were treated by debridement and anterior arthrodesis and were reviewed 8 years or more post operatively and progression of the kyphosis and the fate of the bone grafts were evaluated. The article concluded that it is unwise to rely solely on the graft to prevent vertebral collapse in patients in whom the length of the graft exceeds two disc spaces. Additionally, non-weight-bearing, posterior arthrodesis after six to twelve weeks, and prolonged use of a brace until complete consolidation may also be beneficial.
2. The article (Jain A.K., 2010)² describes the evolution in the field of diagnosis and treatment of tuberculosis from pre-antibiotic era to current status. The author discussed the treatment, complications and indications of surgery in active and late stage of disease and risk factors associated with poor outcome of disease.
3. This article (Rajasekaran S., 2007)³ was a randomized study to compare the accuracy of navigated and non-navigated thoracic pedicle screws in deformity correction surgeries. This study included 27 patients both with scoliosis (N = 27) and kyphosis

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