

The Contribution of Indian Endodontists in Rotary Endodontics to Pubmed Database, from 2000-2017

Sathish Abraham, Disha Lalit Mehta^{*}, Shashidhar C. Bellad, Sayli Patil, Aradhana Babu Kamble, Salil Chaudhari

S.M.B.T Dental College and Hospital and Post Graduate Research Centre, Sangamner, Maharashtra, India

Abstract

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***Correspondence:** Disha Lalit Mehta. S.M.B.T Dental College and Hospital and Post Graduate Research Centre, Sangamner, Maharashtra, India. E-mail: disham1010@gmail.com

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AIM: This study aimed at assessing the trends of publications of Indian Endodontists in the field of rotary Endodontics in the PubMed database from 2000-2017.

METHODS: The date of publication was set from 1st January 2000 to 31st December 2017, wherein keywords entered in the advanced search were "Indian" AND "Dental" AND "Rotary Endodontics". From the collected articles the following criteria were noted: year of publication, the name of the journal, status of the journal, name of the first author, state of origin and the rotary Endodontic file system used.

RESULTS: All data was subjected for statistical analysis by SPSS software version 16. The data were subjected to chi-square test, and a statistically significant difference ($p < 0.001$) was obtained in the inter-6 yearly interval starting from 2000-2017; in the status of the journal; the state of origin and in the generation of rotary files which were published during the study period.

CONCLUSION: The plethora of publications by Indian Conservative Dentists and Endodontists is on the rise, and with the advent of better technology a greater interest in the mechanics and properties of these rotary file systems has invoked greater research work.

Introduction

PubMed-Medline is a widely used and an elaborate database devised by the National Centre for Biotechnology Information and National Institute of Health, USA. This database is updated almost daily and contains details of millions of manuscripts in the field of life sciences. It is the most widely used search tool for millions of health and life sciences researchers. PubMed-Medline is the NLM's (National Library of Medicine, USA) premier online bibliographic database which is freely accessible and covers all the fields such as medicine, nursing, dentistry, veterinary medicine, health care system, and the preclinical sciences [1].

This kind of analysis may help inform the development of scientific and technological policies in dentistry; of special relevance in emerging economies that are currently undergoing rapid transformation [2]. This study aimed to assess the trends of research and

publications of Indian Endodontists in the field of rotary endodontics in the PubMed database from 2000-2017.

The two main objectives of this study were: (i) to assess the total number of articles published by Indian Conservative Dentist and Endodontists, in the field of Rotary file systems in Endodontics from 1st January 2000 to 31st December 2017; (ii) and to understand the state-wise distribution; the status of journals in which articles are published and the frequency and most widely studied rotary file system used during the study period.

Methods

The search commenced on the first fortnight of January 2018 at 7:30 pm and ended at 7:35 pm. The research was conducted in the PubMed database

with a date limitation set from 1st January 2000 at to 31st December 2017. The keywords inserted in the advanced search were “INDIA” AND “DENTAL” AND “ENDODONTICS” AND “ROTARY”. After search completion, a total of two hundred and twenty articles were displayed (Figure 1). These articles were then subjected to a rigorous inclusion criterion wherein the First Author was of Indian nationality. Only the first author was considered for the study. The first author’s affiliation was to be a research institute belonging to an Indian state only. No other speciality except, Conservative Dentistry and Endodontics were included. No journal or types of article limitation were set. All articles, from all types of journals including basic sciences, clinical medical sciences, and dental journals were included. All the articles displayed were considered for the analysis. All articles pertaining to information about Rotary file systems were considered. Articles which included comparisons between Rotary and Reciprocating files systems were considered but only the Rotary systems used in the article were noted.

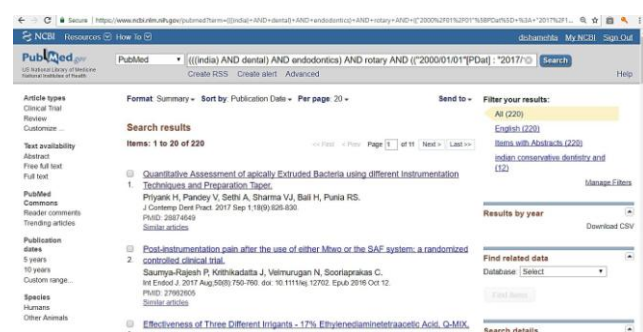


Figure 1: The result page after entering the keywords in advanced search option of PubMed Database, displaying a total of 220 results

On applying the necessary definitive inclusion criteria, a total of one hundred and twenty articles were shortlisted. From this collection of articles, the subsequent information was then charted out in a Microsoft Excel sheet for ease of assessment: the title of the published article, the year of publication, name of the journal, status of the journal (national or international), first author (Only conservative dentists and endodontists), state of origin and finally the type of rotary file system used (including rotary retreatment file systems).

Results

All data thus gathered were entered in SPSS software (version 16.0). From this database, the performance of Conservative Dentist and Endodontist was assessed. Descriptive analysis was performed and presented. Inter-annual distributions, State-wise distribution, the mean number of rotary files in each year, and the trend analysis using the present trend of

articles published was charted in Microsoft Excel.

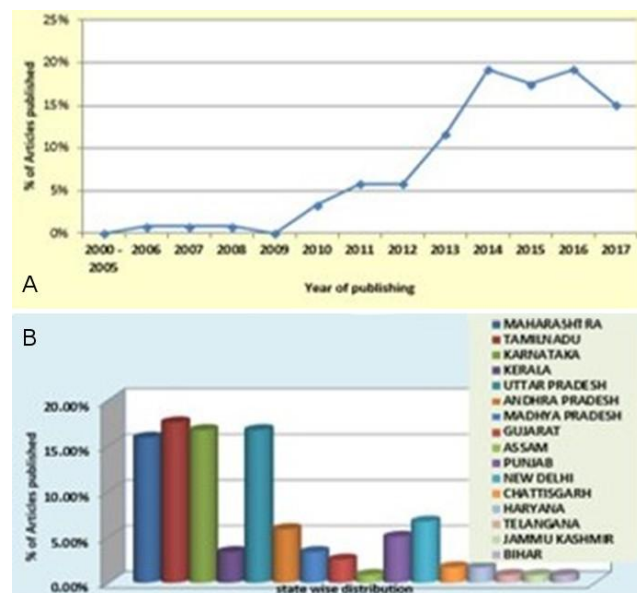


Figure 2: A) Represents the publication trends featuring in articles from 2000-2017 in the field of rotary Endodontics; B) State-wise distribution of the published articles

A trend analysis and an exponential growth in the publications featuring rotary endodontics was seen beginning from 2012 was observed; being highly statistically significant in the third interval (Figure 2a) (Table 1). National journals (72.5%) presented with a highly statistically significant difference over International Journals (27.5%) when subjected to Chi-square test.

Table 1: Comparison of the number of journals which had publications by Conservative Dentist and Endodontics during the study period (2000-2017)

| 6 Yearly Intervals | N (%) | Chi-square test | P value, Significance |
|--------------------|-------------|-----------------|--------------------------------|
| 2000 to 2006 | 1 (0.83%) | 135.05 | p < 0.001*, highly significant |
| 2007 to 2012 | 20 (16.66%) | | |
| 2013 to 2017 | 99 (82.5%) | | |

*p < 0.001-highly statistically significant.

The state-wise distribution of publication trends during the applied study period revealed the maximum number of publications were from Tamil Nadu (17.5%), Karnataka and Uttar Pradesh (16.66% each) and thirdly by Maharashtra (15.83%), (Figure 2b). Table 2 describes the distribution of a file system used in publications during the study period (2000-2017) based on Generations.

Chi-square test was the statistical analysis which revealed that the second generation of the Rotary files was highly statistically significant (p < 0.001).

Amongst all the second-generation files, 26.14% were ProTaper Universal file system (Dentsply) which contributed to being the most featured system.

Table 2: Distribution of file system used in publications by Conservative Dentists and Endodontists during the study period (2000-2017) based on generation; N-percentage of totally publications

| Generation | N (%) | Chi-square test | P value, Significance |
|-------------------|--------------|-----------------|--------------------------------|
| First generation | 19 (7.19 %) | 46.81 | P <0.001* , highly significant |
| Second generation | 151 (57.19%) | | |
| Third generation | 48 (18.18%) | | |
| Fourth generation | 10 (3.78%) | | |
| Fifth generation | 36 (13.63%) | | |

*p<0.001-highly significant.

Discussion

Healthcare professionals usually establish their decisions on professional perspicacity, prevailing comprehensive clinical practice, peer consultation, dental schools, seminars and Continuing Education programs. Clinical know-how, technical prowess, and critical judgment are of utmost importance. Due to the complexity of information, scientific backing to clinical practice must be sought in the medical literature and derived from methodologically ratifying tools [3].

Therefore, it is necessary that surveys should be undertaken, for they provide a scientific basis to professionals in their search to deliver better quality treatment. The importance of bibliometrics has become increasingly useful in analyses of scientific applicability. It is that statistical support that allows gauging and generation of a variety of data and management indicators; particularly from the scientific, technological, productivity-related information gathering and communication systems.

These necessitate the planning, evaluation and management of given scientific context [4]. Publication analysis, as with any method chosen to assess scientific production, does not cover the entirety of the scientific production. However, a similar approach has been successfully used in other partial analysis of dental research production. The applicability of this scientific approach enabled us to understand the scientific productivity by Indian Endodontists in 17 years to understand and calibrate the publication trend specifically in the field of Rotary Endodontics [1] [5] [6] [7].

All the data gathered was from the PubMed database, starting from 1st January 2000 to 31st December 2017, spanning over 17 years. All the data gathered was entered into Microsoft Excel and based on the columns allotted, the articles published were distributed according to our analysis criteria. For ease of distribution the three-time intervals, of 6 years each was considered. The pattern of publications in the first yearly interval, only a single article was published by Indian Conservative Dentists and Endodontists in the period from the year 2000-2006. It was only in the second 6 yearly intervals beginning from 2007, one article per year was published barring 2009. The

articles in this time frame were lesser, as Rotary Endodontics was fairly recent regarding a clinical application in the Indian scenario and the file systems used mainly belonged to the first generation.

Slowly and gradually with the increase in the popularity of rotary endodontics, there was a massive multiplication in the availability and application of the same, this is represented by the exponential growth in the third 6 yearly intervals, comprising of 82.5% of the total articles published in the period of study.

The drastic increase in publication in 2012 could also be due to the following reasons: (1) increase in quantity and quality of conservative dentists and endodontists, (2) increased technological advancements in rotary file systems (3) widespread awareness and ease of use of rotary file systems, (4) increase in number of journals published from India, are some of the common factor to support the same.

The state-wise pattern of publications revealed that the maximum number of articles were published by Conservative dentists and Endodontists from Tamil Nadu state (17.5%) followed by Karnataka and Uttar Pradesh (16.66%) taking the second place and Maharashtra (15.83%) in the third place. Based on the status of the Journal in which the articles were published majority articles featured in National Journals; that complied with 72.5% of the total articles published.

Root canal treatment is one of the most technically challenging procedures in dentistry, and the success depends on the diagnostic acumen, instruments used and the technologies adopted. The adoption of endodontic nickel-titanium rotary technology by Endodontists in India has increased two folds in the last two decades. Hence, this survey was conducted to understand the scenario of publication trends involving Rotary Endodontics by Endodontists in India.

The nickel-titanium rotary instruments are undoubtedly a massive leap in the field of endodontics. The clinical endodontic breakthrough was progressing from utilising a long series of stainless steel hand files and several rotary Gates Glidden drills to integrating nickel-titanium (NiTi) files for shaping canals. Regardless of the methods, the mechanical objectives for canal shaping were brilliantly outlined almost 40 years ago by Dr Herbert Schilder [9]. When properly performed, these mechanical objectives enhance the biological objectives for shaping canals, 3-D disinfection, and filling root canal systems.

The File-systems that featured in all the articles were assessed and then regrouped based on the Generations of evolution of Endodontic Rotary File systems beginning from the first generation to the fifth generation. The second-generation file systems collectively featured in 151 articles and therefore being the highest, this result complied with the trend in

publications seen in the second 6 yearly intervals.

Following the second generation were the third generation, fifth generation, first generation and finally the fourth generation. The least number of publications were with the fourth-generation files systems mainly because the only article containing the Self-Adjusting File system (ReDent Nova) was included as it uses a specialised type of handpiece which has two major functions of vibration and rotation [10].

The fourth generation of files mainly employed the use of single-file based cleaning and shaping protocol and the introduction of a new reciprocating type of motion. Hence, articles containing file systems with reciprocating function were excluded. Therefore, the top 5 file systems in decreasing order of being published in majority articles were ProTaper Universal, Mtwo, K3 & RaCe, ProTaper Next and 5th being profiles & twisted files.

In conclusion, a descriptive study of the contribution of Conservative Dentists and Endodontists' publications to Rotary Endodontics during 2000-2017 in PubMed database is presented. The locational variations and interannual variations are presented. The result of this study clearly shows the lacunae of Conservative dentists and Endodontists' contribution to Indian research in Rotary Endodontics and publications. Efforts should be made by Conservative Dentists and Endodontists in India to increase their global presence regarding scientific contributions.

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