Technique Innovation and Clinical Application of Electrical Impedance Tomography: Bibliometric Research from 2001 to 2020

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Background: Electrical impedance tomography (EIT) is a new test that has been widely used by clinicians in recent years at bedside or in ICU wards. Studies and publications on EIT increased quickly and the hotspot trends changed; however, the overview and characteristics of such studies have not yet been reported. Therefore, we have attempted to interpret the evolution of EIT and to anticipate its possible future clinical use by conducting a statistical analysis of EIT articles over the past 20 years.

Material/Methods: We analyzed EIT-related articles from 2020 and the 20 years prior, sourced from the Web of Science database. The data collected included the number of articles published, the classification of the articles, basic information, and author affiliation.

Results: Our study retrieved a total of 1427 EIT-related articles through screening, with the most articles published from Chinese authors and the Chinese Air Force Military Medical University, and the most cited article type being EIT-related basic research. Most articles on EIT have been published in the journal Physiological Measurement. Furthermore, the hotspots and research trends of EIT have changed from basic innovation development to clinical application in the past 20 years.

Conclusions: This paper presents a statistical analysis of articles on EIT over the last 20 years, focusing on trends from the mechanisms of EIT to its clinical use.

Keywords: Anesthesiology • Positive-Pressure Respiration • Respiration

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Background

Since its discovery, EIT has been widely used in clinics and has now become a new type of imaging tool [1-5]. Compared with other techniques, EIT has the advantages of non-radiation and non-invasiveness, and the imaging results depend on the electrical potential of the chest wall surface. When EIT is conducted, an electric current passes through the set plane, generates a potential gradient on the surface of the chest wall, and displays two-dimensional impedance imaging on the computer. Previous studies have shown that EIT can cause local changes in lung ventilation [6-10]. The final qualitative information extracted by EIT was similar to that reported by computed tomography (CT) or ventilation scintillation [11-13]. EIT can reflect the state of lung ventilation function from the side and can be used as an index to evaluate the effect of positive end-expiratory pressure [10,14], which helps understand the risk of ventilator-induced lung injury [10,14].

EIT can dynamically observe regional lung ventilation [15] and calculate the size of the local mechanical energy. Positive end-expiratory pressure (PEEP) is an important component of mechanical energy. The adjustment of PEEP can affect the distribution of gas in the lungs [16], in turn affecting the magnitude of the local mechanical energy. In recent years, clinicians have used EIT technology to observe the characteristics of moisture distribution and local mechanical energy changes during PEEP titration, which can provide useful information for the setting of PEEP parameters [14].

Bibliometric analysis is a uniform and objective analysis of a number of published papers that have had some influence in a particular line of research [17,18]. We searched databases and found that there are no high-quality bibliometric analyses of EIT. This study aimed to discover the citation trend of published papers on EIT to help understand the current status of EIT research and provide clinicians with better lung function reference indicators.

Material and Methods

Search Strategy

The Web of Science database was used to survey articles on EIT published between 2001 and 2020. The search was conducted using “Electrical impedance tomography” as the title, restricting the article type to “article review” and searching for English language publications only. The following bibliometric information were collected: year of publication; country; journal publication; number of citations; author; grant; discipline; institution; and subject. No other exclusion criteria were used.

Statistical Analysis

SPSS 22.0 statistical software was used for statistical analysis of the data. The data are expressed as mean±standard deviation by t test, and the count data are expressed as rate (%) by the chi-square test. P<0.05 indicates that a difference was statistically significant.

Results

Year and Country of Publication

For articles since 2001, our statistical analysis revealed no significant differences in the number of publications per year until 2013, and the number of published articles was small. However, the number of EIT articles rose sharply since 2014, and China and Germany have contributed a larger proportion, with over 100 articles/year published in 2019 and 2020 (Figure 1A). A statistical analysis showed that the largest number of articles were published by authors from China (n=254), followed by England (n=246), and Germany (n=244). The US ranked fourth highest in number of published articles, but they had the highest number of citations (n=15792) (Table 1). The number of collaborations by country was also counted, and the number of collaborations with Germany and China was greater than in other countries (Figure 1B). For more detailed data, see Figure 1 and Table 1.

Authors and Institutions

We ranked the number of posts and put together a tally of the information underlying these articles. Feng Fu from the Air Force Military Medical University (n=18) published the largest number of articles. The authors with the highest H-index among the top 20 were Inez Frerichs (H-index=11) from the University Medical Center Schleswig Holstein. More detailed data are presented in Table 2. The 20 most published institutions were also counted, and the 2 most published institutions were the University of London (n=90) and the University College London (n=87) from the UK, followed by the University of Kiel (n=70). The University of Eastern Finland (2575 citations; 39.62 citations per article) had the highest number of citations, with the third highest H-index of 27. This information is detailed in Table 3 and Figure 2.

Subjects and Funds

The journal disciplines were analyzed by counting the journal disciplines in which EIT articles were published. EITs consistently appeared most frequently in engineering (29%), followed by physiology (10%) and biophysics (9%). Anesthesiology accounted for approximately 1% of this field during this
period (Figure 3). Again, the top 10 organizations with the highest number of sponsored articles have been counted according to the number of sponsored articles. One sponsoring institution from China, 4 from the United States, and 5 from Europe were included. The funding agency with the most articles was the National Natural Science Foundation of China (n=168), followed by 2 sponsors from the USA, namely the National Institutes of Health (n=90) and the United States Department of Health and Human Services (n=90). More detailed data can be found in Table 4.

Journal Analysis

We then looked at the number of published EIT articles and ranked them by number (Table 5). The highest published journal was Physiological Measurement (n=228), followed by Inverse Problems (n=64), and IEEE Transactions on Medical Imaging (n=60). Among these journals, Intensive Care Medicine had the highest frequency of citations (76.14 citations per article) and the highest impact factor (IF=17.44). Figure 4 shows the results of a statistical analysis of the top 10 most published journals. Physiological Measurement accounted for a high percentage of the number of publications per year. Interestingly, from 2014 onwards, the number of journals receiving EIT articles and the number of articles published in these journals began to increase, like IEEE Transactions on Instrumentation and Measurement and IEEE Sensors Journal. One journal in anaesthesiology, Acta Anaesthesiologica Scandinavica, was included.
Table 1. Table of the 10 countries with the highest number of published EIT articles.

| Number | Country          | Number of publications | Number of cited | Average number of citations per article |
|--------|------------------|------------------------|-----------------|----------------------------------------|
| 1      | Peoples R China  | 254                    | 2245            | 8.84                                   |
| 2      | England          | 246                    | 5959            | 24.22                                  |
| 3      | Germany          | 244                    | 6146            | 25.19                                  |
| 4      | USA              | 241                    | 7972            | 33.08                                  |
| 5      | South Korea      | 134                    | 3089            | 23.05                                  |
| 6      | Finland          | 108                    | 3367            | 31.18                                  |
| 7      | Canada           | 60                     | 1566            | 26.1                                   |
| 8      | Australia        | 52                     | 1155            | 22.21                                  |
| 9      | Brazil           | 48                     | 1730            | 36.04                                  |
| 10     | Switzerland      | 46                     | 1179            | 25.63                                  |
| 11     | France           | 44                     | 910             | 20.68                                  |
| 12     | Netherlands      | 40                     | 1526            | 38.15                                  |
| 13     | Italy            | 37                     | 754             | 20.38                                  |
| 14     | Austria          | 33                     | 464             | 14.5                                   |
| 15     | Spain            | 26                     | 1162            | 44.69                                  |
| 16     | Scotland         | 25                     | 417             | 16.68                                  |
| 17     | Japan            | 24                     | 234             | 9.75                                   |
| 18     | Poland           | 23                     | 155             | 6.74                                   |
| 19     | Sweden           | 22                     | 948             | 43.09                                  |
| 20     | Turkey           | 22                     | 545             | 24.77                                  |

Table 2. Table of the 20 authors with the highest number of published EIT articles.

| Number | Name              | Institution                          | Number of articles | H index |
|--------|-------------------|--------------------------------------|--------------------|---------|
| 1      | Fu, Feng          | Air Force Military Medical University| 18                 | 5       |
| 2      | Kim, Kyung Youn   | Jeju National University             | 16                 | 9       |
| 3      | Dong, Xiuzhen     | Air Force Military Medical University| 15                 | 9       |
| 4      | Hyvonen, N        | Aalto University                     | 14                 | 8       |
| 5      | Liu, Dong         | University Sci & Technol China       | 13                 | 9       |
| 6      | Zhao, Zhangi      | Furtwangen University                | 13                 | 7       |
| 7      | Frerichs, Inez    | University Med Ctr Schleswig Holstein| 11                 | 11      |
| 8      | Dong, Feng        | Tianjin University                  | 9                  | 4       |
| 9      | Mueller, J L      | Colorado State University            | 9                  | 5       |
| 10     | Oh, Tong In       | Kyung Hee University                | 9                  | 5       |
| 11     | Woo, Eung Je      | Kyung Hee University                | 9                  | 8       |
**Table 2 continued.** Table of the 20 authors with the highest number of published EIT articles.

| Number | Name                  | Institution                  | Number of articles | Cited times | Average citation per article | H index |
|--------|-----------------------|------------------------------|--------------------|-------------|------------------------------|---------|
| 12     | Kim, M C              | Cheju Natl University        | 8                  | 2205        | 24.50                        | 28      |
| 13     | Kaipio, Jari P        | University Kuopio            | 7                  | 2194        | 25.22                        | 28      |
| 14     | Yue, Shihong          | Tianjin University           | 7                  |             |                              | 4       |
| 15     | Borcea, Liliana       | Rice University              | 6                  | 1928        | 27.54                        | 25      |
| 16     | Choi, Charles T. M.   | Natl Chiao Tung University   | 6                  | 1889        | 27.38                        | 25      |
| 17     | Hamilton, Sarah Jane  | Marquette University         | 6                  | 1116        | 22.32                        | 16      |
| 18     | Holder, D S           | University London University Coll | 6             | 557         | 8.44                         | 14      |
| 19     | Jia, J B              | University Edinburgh        | 6                  | 1154        | 38.47                        | 17      |
| 20     | Ren, S J              | Tianjin University           | 6                  | 839         | 26.22                        | 12      |

**Table 3.** Table of the 20 institutions that publish the most EIT articles.

| Number | Institution                  | Number of articles | Cited times | Average citation per article | H index |
|--------|------------------------------|--------------------|-------------|------------------------------|---------|
| 1      | University of London        | 90                 | 2205        | 24.50                        | 28      |
| 2      | University College London   | 87                 | 2194        | 25.22                        | 28      |
| 3      | University of Kiel          | 70                 | 1928        | 27.54                        | 25      |
| 4      | Schleswig Holstein University Hospital | 69            | 1889        | 27.38                        | 25      |
| 5      | Air Force Military Medical University | 66           | 557         | 8.44                         | 14      |
| 6      | University of Eastern Finland | 65             | 2575        | 39.62                        | 27      |
| 7      | Tianjin University          | 54                 | 532         | 9.85                         | 15      |
| 8      | Kyung Hee University        | 53                 | 1736        | 32.75                        | 21      |
| 9      | Furtwangen University       | 50                 | 1116        | 22.32                        | 16      |
| 10     | Jeju National University    | 43                 | 484         | 11.26                        | 13      |
| 11     | Aalto University            | 41                 | 1263        | 30.80                        | 17      |
| 12     | Yonsei University           | 41                 | 1691        | 41.24                        | 24      |
| 13     | Ruhr Aachen University      | 37                 | 1235        | 33.38                        | 16      |
| 14     | University of São Paulo     | 36                 | 1537        | 42.69                        | 16      |
| 15     | Dartmouth College           | 35                 | 807         | 23.06                        | 16      |
| 16     | University of Sheffield     | 33                 | 936         | 28.36                        | 16      |
| 17     | Carleton University         | 32                 | 839         | 26.22                        | 12      |
| 18     | University of California System | 31             | 1312        | 42.32                        | 16      |
| 19     | Konkuk University           | 30                 | 1154        | 38.47                        | 17      |
| 20     | Middlesex University        | 30                 | 1131        | 37.70                        | 16      |
Citations and Correlation Analysis

Each article has a different number of citations and we have summarized the most frequently cited articles over the last 20 years for comparison. These 20 articles included 14 basic studies, 1 retrospective clinical study, and 5 reviews (Figure 5A). The research content of the articles about new algorithms and protocols for EIT were classified as “EIT innovation articles” by us. EIT used to guide clinical treatment was classified as “clinical applications”. Fifteen articles described new ideas and proposed hypotheses for EIT, and 5 articles focused on the application of EIT to clinical work (Figure 5B). Interestingly, the...
### Table 4. Table of the 10 funding bodies that published the highest number of EIT articles.

| Number | Funding agency                                           | Number of publications |
|--------|----------------------------------------------------------|------------------------|
| 1      | National Natural Science Foundation of China (NSFC)      | 168                    |
| 2      | National Institutes of Health NIH USA                    | 90                     |
| 3      | United States Department of Health Human Services        | 90                     |
| 4      | European Commission                                      | 83                     |
| 5      | UK Research Innovation (UKRI)                            | 60                     |
| 6      | Academy of Finland                                       | 57                     |
| 7      | Engineering Physical Sciences Research Council (EPSRC)   | 50                     |
| 8      | NIH National Institute of Biomedical Imaging Bioengineering (NIBIB) | 38         |
| 9      | German Research Foundation (DFG)                         | 29                     |
| 10     | National Science Foundation (NSF)                        | 29                     |

### Table 5. Table of the 20 journals with the highest number of published EIT articles.

| Number | Name                                             | Number of articles | Number of cited | Citations per article | IF      | JCR partition |
|--------|--------------------------------------------------|--------------------|-----------------|-----------------------|---------|---------------|
| 1      | Physiological Measurement                        | 228                | 4610            | 20.22                 | 2.833   | Q3            |
| 2      | Inverse Problems                                 | 64                 | 2296            | 35.88                 | 2.407   | Q1            |
| 3      | IEEE Transactions on Medical Imaging             | 60                 | 2638            | 43.97                 | 10.048  | Q1            |
| 4      | IEEE Transactions on Biomedical Engineering      | 51                 | 2461            | 48.25                 | 4.538   | Q2            |
| 5      | Measurement Science and Technology               | 46                 | 1135            | 24.67                 | 2.046   | Q3            |
| 6      | IEEE Transactions on Instrumentation and Measurement | 31             | 346             | 11.16                 | 4.016   | Q1            |
| 7      | IEEE Sensors Journal                             | 28                 | 341             | 12.18                 | 3.301   | Q2            |
| 8      | Clinical Physics and Physiological Measurement   | 24                 | 330             | 13.75                 | –       | –             |
| 9      | Inverse Problems and Imaging                     | 23                 | 280             | 12.17                 | 1.639   | Q2            |
| 10     | Critical Care                                    | 22                 | 734             | 33.36                 | 9.097   | Q1            |
| 11     | Physics in Medicine and Biology                  | 20                 | 648             | 32.4                  | 3.609   | Q2            |
| 12     | IEEE Transactions on Magnetics                   | 18                 | 253             | 14.06                 | 1.7     | Q3            |
| 13     | IEEE Transactions on Biomedical Circuits and Systems | 17             | 298             | 17.53                 | 3.833   | Q2            |
| 14     | Siam Journal on Applied Mathematics              | 17                 | 494             | 29.06                 | 2.08    | Q2            |
| 15     | Medical Biological Engineering Computing         | 16                 | 406             | 25.38                 | 2.602   | Q2            |
| 16     | PLoS One                                        | 15                 | 140             | 9.33                  | 3.24    | Q2            |
| 17     | Intensive Care Medicine                          | 14                 | 1066            | 76.14                 | 17.44   | Q1            |
| 18     | Inverse Problems in Science and Engineering      | 14                 | 118             | 8.43                  | 1.95    | Q3            |
| 19     | Review of Scientific Instruments                 | 14                 | 132             | 9.43                  | 1.523   | Q3            |
| 20     | Acta Anaesthesiologica Scandinavica              | 13                 | 360             | 27.69                 | 2.105   | Q4            |
The top 2 highest-cited articles had the same title. The first was *Electrical impedance tomography* by Cheney, published in 1999 (cited frequency 719), which reviewed the reconstruction algorithm for EIT [19]. The other, published by Borcea published in 2002 (cited frequency 481), reviewed theoretical and numerical studies of the EIT inverse problem [20]. Third was *Comparing reconstruction algorithms for electrical impedance*, published by Yorkey in 1987 (cited frequency 401), which presented a new reconstruction algorithm [21]. Notably, Clinical recommendations when EIT is used in the chest, published by Frerichs in 2017, presented a consensus on the use of EIT for clinical mechanical ventilation and had the highest average annual citation count (78.5 citations per year on average) [22] (Table 6).

There was no correlation except for a significant correlation between year of publication and frequency of citations ($r=0.3879; P=0.05$) (Figure 5).

**Hotspots and Publication Trends**

The classification of EIT articles into popular topics is based on the keywords of the article. The size of the circles in the graph and the thickness of the lines between them indicate how popular the topic is. All articles included in this period are categorized and summarized according to the first and last decade. For the first 10 years, the publications on EIT focused on innovation mechanism or system, as shown in the blue and green clusters (Figure 6A). In the latter decade, EIT articles began to become a more frequent and hot topic (Figure 6B). “Reconstruction or Image reconstruction” forms an important part of the green cluster. Meanwhile, the clinical application-related red cluster obviously increased, indicating the hotspots of EIT trends to clinical treatment. The key words “mechanical ventilation”, “PEEP”, “acute respiratory distress”, “obese patients”, “surgery”, or “general anesthesia” demonstrated the clinical interest of EIT.

**Discussion**

We searched the database and collected EIT articles from the 20 years after 2001, analyzing the types of articles and basic information. By conducting a correlation analysis, we found that the newer the year of the article, the higher the number of citations of the article, but the impact factor was not related to the number of citations of the article. Finally, by analyzing the hot trends of articles in the last 10 years, we found that EIT tends to move from basic research to clinical.
China contributed the highest number of articles and collaborated more with other countries. Among the authors with the highest number of articles, there were 6 from China, including the top author Feng Fu from the Air Force Military Medical University. The National Natural Science Foundation of China was the funding agency with the most articles. These results indicate that China was academically active in the field of EIT.

As a radiation-free non-invasive functional image monitoring technique, EIT provides lung ventilation, especially regional lung ventilation, and perfusion at the bedside [23]. Clinical needs have driven scientific and clinical interest in this advanced method. EIT assessment conveniently obtains unique clinical images without adverse effects compared with other similar techniques such as CT. For research hotspots, the co-existing keywords suggested that the earlier decade (2001 to 2010) was still the device development period, mainly focusing on image reconstruction, data analysis, and substitution algorithms. In the last decade, an increasing number of clinical trials in EIT applications have been published. EIT is widely used for acute respiratory distress syndrome (ARDS) or chronic obstructive pulmonary disease (COPD) patients in the intensive care unit (ICU), guiding mechanical ventilation therapy [24-27]. EIT is also a good choice due to its radiation-free features for neonates, infants, and children that require clinical interventions for lung function [28-30]. For patients under general anesthesia and undergoing surgery, EIT also provided excellent information for preoperative evaluation, perioperative personalized PEEP setup, and postoperative monitoring [31]. Several studies have titrated PEEP in obese patients to guide EIT during surgery to prevent postoperative atelectasis [32,33].

In the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, EIT was used for the treatment of COVID-19-associated ARDS patients [34]. EIT is valuable as a bedside tool for evaluating ventilation distribution and perfusion and guiding PEEP titration [35,36]. Another case report suggested that in the time of COVID-19, EIT identified perfusion impairment...
| Number | Topic                                                                 | Corresponding Author | Institution                     | Journal                       | Year | Cited frequency | Average citations per year |
|--------|------------------------------------------------------------------------|-----------------------|---------------------------------|-------------------------------|------|-----------------|----------------------------|
| 1      | Electrical impedance tomography                                        | Cheney, M             | Rensselaer Polytech Inst         | Sian Review                   | 1999 | 719             | 32.7                       |
| 2      | Electrical impedance tomography                                        | Borcea, L             | Rice Univ                       | Inverse Problems              | 2002 | 481             | 25.3                       |
| 3      | Comparing reconstruction algorithms for electrical-impedance         | Yorkey, TJ            | Univ Califlaware                 | ieee Transactions on Biomedical Engineering | 1987 | 401             | 11.8                       |
| 4      | Imbalances in regional lung ventilation - A validation study on electrical impedance tomography | Amato, MBP            | USP, Fac Med                     | American Journal of Respiratory and Critical Care Medicine | 2004 | 341             | 20.1                       |
| 5      | Tikhonov regularization and prior information in electrical impedance tomography | Kaipio, JP            | Univ Kuopio                      | ieee Transactions on Medical Imaging | 1998 | 329             | 14.3                       |
| 6      | Chest electrical impedance tomography examination, data analysis, terminology, clinical use and recommendations: consensus statement of the Translational EIT development study group | Frerichs, I           | Univ Med Ctr Schleswig Holstein  | Thorax                        | 2017 | 314             | 78.5                       |
| 7      | Three-dimensional electrical impedance tomography                      | Metherall, P          | Univ Sheffield                   | Nature                        | 1996 | 308             | 12.3                       |
| 8      | A Matlab toolkit for three-dimensional electrical impedance tomography: a contribution to the Electrical Impedance and Diffuse Optical Reconstruction Software project | Lionheart, WRB         | Univ Manchester                  | MeasurementScience and Technology | 2002 | 279             | 14.7                       |
| 9      | Bioimpedance tomography (Electrical impedance tomography)              | Bayford, RH           | Middlesex Univ                   | Annual Review of Biomedical Engineering | 2006 | 252             | 16.8                       |
| 10     | Three-dimensional electrical impedance tomography based on the complete electrode model | Vauhkonen, M          | Univ Kuopio                      | ieee Transactions on Biomedical Engineering | 1999 | 238             | 10.8                       |
| 11     | Magnetic resonance electrical impedance tomography (MREIT): Simulation study of J-substitution algorithm | Woo, EJ               | Kyung Hee Univ                   | ieee Transactions on Biomedical Engineering | 2002 | 223             | 11.7                       |
Table 6 continued. Table of top 20 highly cited articles.

| Number | Topic                                                                 | Corresponding Author | Institution                  | Journal                        | Year | Cited frequency | Average citations per year |
|--------|-----------------------------------------------------------------------|-----------------------|------------------------------|--------------------------------|------|-----------------|----------------------------|
| 12     | Statistical inversion and Monte Carlo sampling methods in electrical impedance tomography | Kaipio, JP           | Univ Kuopio                  | Inverse Problems               | 2000 | 220             | 10.5                       |
| 13     | Bedside estimation of recruitable alveolar collapse and hyperdistension by electrical impedance tomography | Amato, MBP           | Univ São Paulo               | Intensive Care Medicine        | 2009 | 219             | 18.3                       |
| 14     | Electrical impedance tomography (EIT) in applications related to lung and ventilation: a review of experimental and clinical activities | Frerichs, I          | Univ Gottingen               | Physiological Measurement      | 2000 | 215             | 10.2                       |
| 15     | Detection of local lung air content by electrical impedance tomography compared with electron beam CT | Frerichs, I          | Univ Gottingen               | Journal of Applied Physiology  | 2002 | 210             | 11.1                       |
| 16     | Electrical impedance tomography and Calderon’s problem                | Uhlmann, G           | Univ Washington              | Inverse Problems               | 2009 | 194             | 16.2                       |
| 17     | Electrical impedance tomography: Regularized imaging and contrast detection | Adler, A             | Ecole Polytech               | Ieee Transactions on Medical Imaging | 1996 | 183             | 7.3                        |
| 18     | Electrical impedance tomography using level set representation and total variational regularization | Tai, XC              | Univ Bergen                  | Journal of Computational Physics | 2005 | 165             | 10.3                       |
| 19     | An image-enhancement technique for electrical-impedance tomography     | D C Dobson           | University of Minnesota System | Inverse Problems               | 1994 | 152             | 5.6                        |
| 20     | Conductivity and current density image reconstruction using harmonic B-z algorithm in magnetic resonance electrical impedance tomography | Oh, SH               | Kyung Hee Univ               | Physics in Medicine and Biology | 2003 | 150             | 8.3                        |
Figure 6. Summary of EIT Research Trends and Hotspots. (A) Hotspots for articles published in EIT in the previous decade. (B) Hotspots for articles published in EIT in the second decade.

that might require CT pulmonary angiography (CTPA) and evaluated the effect of therapy [37].

Some very influential articles are not counted in the list of high-frequency citations, probably because they were published very recently, for example, but that does not mean they are not important. Our search for EIT articles was limited to the Web of Science and did not include other databases [16], so some published articles may not have been collected by the search.

**Conclusions**

In conclusion, the hotspot and publication trends in the EIT from 2001 to 2020 were analyzed. This research clearly demonstrated that the study interest in EIT has increased yearly and has changed from technique development to clinical application. China contributed significantly to the field of EIT study, with the highest number of publications, the top author, and the funding agency with the most articles.
Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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