BMJ Open

The 100 Top-cited Articles Focusing on Acute Kidney Injury: a bibliometric analysis

	RM1 Open
Journal:	BMJ Open
Manuscript ID	bmjopen-2016-011630
Article Type:	Research
Date Submitted by the Author:	22-Feb-2016
Complete List of Authors:	Liu, Yuan-hui; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Wang, Sheng-qi; Department of Pharmacy, Nanfang Hospital, Southern Medical University, Guangzhou, 510515, China, Xue, Jin-hua; Department of Physiology, School of Basic Medical Sciences, Gannan Medical University, Ganzhou, 341000, China, Liu, Yong; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Chen, Ji-yan; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Li, Guo-feng; Department of Pharmacy, Nanfang Hospital, Southern Medical University, Guangzhou, 510515, China, He, Peng-cheng; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Cardiovascular Institute, Guangzhou 510100, China, Li, Guo-feng; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Tan, Ning; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China,
Primary Subject Heading :	Renal medicine
Secondary Subject Heading:	Renal medicine
Keywords:	Bibliometric analysis, Acute kidney injury, Top 100 cited articles

SCHOLARONE[™] Manuscripts

The 100 Top-cited Articles Focusing on Acute Kidney Injury: a bibliometric analysis

Yuan-hui Liu MD^{1#}, Sheng-qi Wang MD^{2#}, Jin-hua Xue MD^{3, 4#}, Yong Liu MD¹, Ji-yan Chen MD, FACC, FESC¹, Guo-feng Li MD², Peng-cheng He MD^{1*}, Ning Tan MD, FACC, FESC, FAPSIC^{1*}

[#]Equal contributors

*Corresponding author

¹Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China

²Department of Pharmacy, Nanfang Hospital, Southern Medical University, Guangzhou, 510515, China

³Department of Pathophysiology, School of Basic Medical Sciences, Southern Medical University, Guangzhou, 510515, China

⁴Department of Physiology, School of Basic Medical Sciences, Gannan Medical University, Ganzhou, 341000, China

Correspondence: Ning Tan, MD, FACC, FESC, FAPSIC. Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China. E-mail: gdtanning@126.com; Telephone: +86-20-83819161; Fax: +86-20-83824369;

Abstract

Background: Acute kidney injury (AKI) is a major global health issue, associated with poor shortand long-term outcomes. Research on AKI is increasing with numerous articles published. However, the quantity and quality of research production in the field of AKI is unclear.

Methods and analysis: To analyze the characteristics of the most cited articles on AKI and to provide information about achievements and developments in AKI, we searched the Science Citation Index Expanded for citations of AKI articles. For the top 100 most frequently cited articles (T100), we evaluated the number of citations, publication time, province of origin, journal, impact factor, topic or subspecialty of the research, and publication type.

Results: The T100 articles ranged from a maximum of 1971 citations to a minimum of 215 citations (median 302 citations). T100 articles were published from 1951 to 2011, with most articles published in the 2000s (n=77), especially the 5-year period from 2002 to 2006 (n=51). The publications appeared in 30 journals, predominantly in the general medical journals, led by New England Journal of Medicine (n=17), followed by expert medical journals, led by the Journal of the American Society of Nephrology (n=16) and Kidney International (n=16). The great majority (83.7%) of T100 articles were published by teams involving \geq 3 authors. T100 articles originated from 15 countries, led by the USA (n = 81) followed by Italy (n = 9). Among the T100 articles, 69 were clinical research, 25 were basic science, 21 were reviews, 5 were meta-analyses and 3 were clinical guidelines. Most clinical articles (55%) included patients with any cause of AKI, followed by the specific causes of contrast-induced AKI (25%) and cardiac surgery-induced AKI (15%).

Conclusions: This study provides a historical perspective on the scientific progress on AKI, and highlights areas of research requiring further investigations and developments.

Key words: Citation analysis; Acute kidney injury; Top 100 cited articles.

Strengths and limitations of this study

Two meticulous searches were performed in the Web of Science and consistent results were demonstrated in Scopus data.

Since some articles were cited more frequently than others because of the differences in time since publication, and this error was adjusted by a citation index determined for each article.

The language of publication was restricted to English, which would have failed to capture landmark articles published in other languages.

Findings of the present study would provide a historical perspective on the scientific progress on acute kidney injury.

Findings of the present study would highlights areas of research requiring further investigations and developments.

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES)

Enseignement superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de I Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

Introduction

Acute kidney injury (AKI) is a major global health issue and its incidence is markedly increasing in both developed and developing nations. The reported incidence ranges from 5% to 30-50% in patients under various conditions, such as coronary intervention, cardiac surgery, and intensive care unit admission. The development of AKI not only increases hospital stay and health care costs, but also results in poor short- and long-term outcomes¹⁻⁴. Considering the importance of AKI, researches in this field has been increasing, and numerous articles have been published annually, giving new insights into the mechanism, early recognition, prevention or treatment of AKI. However, little is known regarding the quality of scientific achievements in this area.

Citation analysis is a bibliometric process that determines the influence of an article in the scientific community and evaluates the impact factor (IF) of a journal. The number of citations received by an article is a measure of its recognition and influence within the scientific community. A paper with greater citation history may be more valuable in its field⁵. Furthermore, citation analysis of the scientific literature may help to identify articles, research topics, and authors of influence. Therefore, academic institutions, funding agencies, and the public become increasingly interested in using citation analysis to assess the research quality and productivity of individual researchers ⁶. Numerous attempts have been made to identify the most cited articles in various medical disciplines, including traumatic brain injury ⁷, radiology ⁸, hypospadiology ⁹, hypertension ¹⁰ and cardiac surgery ¹¹. However, no citation analysis of AKI has been published to date. Therefore, we aimed to analyze the characteristics of the 100 top-cited articles focused on AKI, and to determine achievements and advances in this field during the past century.

Methods

We conducted a citation search of the Science Citation Index Expanded of the ISI Web of Science (Thomson Reuters, Philadelphia, PA, USA) from 1945 to 15 July 2015. The search topic terms included "acute kidney injury" or "AKI" or "acute renal failure" or "ARF". All electronic searches were conducted on one day, 15 July 2015, to avoid changes in citation rate as much as possible. After all identified articles were retrieved, and the results were sorted using the option "Times cited", which yielded a list of all the articles published in a specific journal ranked by citation number. Articles on the list were then reviewed by two independent reviewers (Y.H.L and S.Q.W) by reading the abstracts or full-texts acquired from PubMed, Embase and ScienceDirect. Only studies focusing on AKI were selected for further analysis. Any disagreement between the two

reviewers was resolved through re-review or discussion with a third reviewer (J.H.X). There was a restriction on language (only English), but not on study type.

The top 100 (T100) identified articles were further analyzed by the two reviewers (Y.H.L and S.Q.W) independently according to the following parameters: citation number, authorship(first, second and corresponding authors), journal name and IF, title, number of authors, country of origin (defined by the address of the corresponding author), publication year, funding source, type of article, and level of evidence for clinical studies (evaluated based on the levels of evidence introductory document from the Oxford Centre for Evidence-based Medicine)¹². The journals IFs were cross-referenced with the 2015 edition of Journal Citation Reports (JCR): Science Edition (1945-2014). Based on their study design, research setting and goals, the selected articles were grouped into 5 categories: clinical guidelines, review, meta-analysis, basic research, and clinical research (including observational and randomized control trials, RCTs). Prospective, retrospective, and case series were all categorized as observational studies. RCTs include both single- and double-blind studies. According to the causes of AKI, the topics were divided into (1) any cause, (2) contrast, (3) cardiac surgery, and (4) others. In addition, since some articles were cited more frequently than others because of the difference in time since publication, this error was adjusted by a citation index determined for each article. The citation index was defined as the mean number of citations per year. For comparison, we searched Scopus (http://www.scopus.com/ search/form.url; retrieved on July 15th, 2015) for total citation counts of the T100 articles.

Statistical analysis

Data are represented as median or interquartile range. The differences between groups were evaluated by the Wilcoxon rank sum test. The Spearman test was used to evaluate the strength and direction of the linear relationship between journal IF and the number of T100 cited articles or citations, and the correlation of article citations between different databases (Web of Science and Scopus). All data analyses were performed with SPSS 17 software (SPSS Inc., Chicago, IL, USA). All probability values were two-tailed, and the threshold for significance was set at P < 0.05.

Results

Citation count and publication year

A total of 56,830 papers were identified after the initial search in the period from 1945 to present. Among them, articles that focused solely on AKI and were among the top 100 most cited were included. Ultimately, 123 articles (including some duplicate citations) were included in the analysis

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

(Table1 and 1S). The median number of citations was 302 (range 215 to 1,971), with only three papers cited over 1000 times. The citation index (median 216, range 5 to 184) was correlated with number of the citations (r=0.581, P<0.001) per article. In addition, the number of citation and citations index per article were positively correlated between the Web of Science and Scopus database (r=0.770, P < 0.001; r=0.791, P < 0.001, respectively).

The selected T100 articles were published from 1951 to 2011, with most articles published in the 2000s (n=77), and particularly the 5-year period from 2002 to 2006 (n=51), followed by the 1990s (n=22) (Figure 1). The single years with the most cited articles were 2004 and 2006 (each n=13). The number of citations was also the highest in the 2000s (30, 537) followed by the 1990s (9510). Spearman test indicated an uptrend between the citation index and time (r=0.315, P < 0.001). There is no correlation between time and number of citations(r=-0.003, P=0.975), but a positive correlation between time and citation index(r=0.347, P < 0.001).

Publishing journals of T100 articles

The T100 articles were published in 30 journals (**Table 2**), predominantly in general medical journals, led by the New England Journal of Medicine (n=17), followed by expert medical journals, led by the Journal of the American Society of Nephrology (n=16) and Kidney International (n=16) (Table 2). In addition, Journal of Clinical Investigation, Lancet, Journal of the American Medical Association, American Journal of Medicine, and Critical Care Medicine contributed 11, 7, 5, 5, and 5 top cited articles, respectively. The journal' IFs of T100 articles ranged from 2.1 to 55.9. Many of the T100 articles were published in high-IF journals, while the journal IF was significantly correlated with the number of T100 articles (r=0.439, p=0.017), and the number of citations (r=0.476, p=0.009).

Authorship, Origins, and Institutions

The great majority (83.7%) of T100 articles were produced by teams involving \geq 3 authors. A list of the most frequently-appearing authors is presented in Table 5. It is clearly dominated by JV Bonventre, who authored 10 T100 articles (first author: 5; corresponding author: 9) with a total of 4,527 citations, and P Devarajan, who authored 8 T100 articles with 3428 citations (**Table 3**).

The T100 articles originated from 15 countries, led by the USA (n = 81) followed by Italy (n = 9), Germany (n=7), France (n=5), and the United Kingdom (n=5), with all other counties having less than five publications, as shown in **Figure 2**. Articles originating from the USA also had the highest mean number of citations (mean 384 citations per article). Of the T100 articles, the leading

institutions with the most productive articles were Brigham and Women's Hospital (Boston, USA), Cincinnati Children's Hospital Medical Center (Cincinnati, USA) and the University of California, San Francisco (San Francisco, USA), with five articles each. The two institutions ranking next is the Yale University (West Haven, USA) (Table 4).

Publication type and areas of study

The T100 articles included 69 clinical studies, 25 basic science studies, 21 reviews, 5 meta analyses and 3 clinical guidelines (Figure 3). The number of total citations per article ranged from 218 to 1652 (median, 303) for clinical research, and from 215 to 814 (median, 257) for basic science. Of the 69 clinical articles, the most common type was prospective observational study (n=35), followed by RCT (n=16), retrospective study (n=16), and case report (n=2).

The primary purpose of these clinical studies included evaluation of a therapy strategy (n=16), description of biomarkers or risk model to prevent AKI (n=9, and n=3, respectively), description of epidemiology (n=27), evaluation of a diagnostic modality (n=5), and others (n=9). With regard to the causes of AKI in clinical researches, most articles (55%) included patients with any cause of AKI, followed by specific contrast induced AKI (25%) and cardiac surgery induced AKI (15%). Only 1 study reported on drug induced AKI, and the rest were nontraumatic rhabdomyolysis induced AKI (n=3). In addition, ischemic induced AKI was the most common type of AKI (64%) assessed in basic science studies, followed by drug induced AKI models (32%) and only 1 basic research study concerned surgery induced AKI.

Funding source and level of evidence

Among T100 articles (original articles), 60 were funded by public foundations, 3 received support from commercial companies, 8 were supported by both, and the remaining 52 did not specify the funding source (**Figure 4**). More than half of studies that disclosed funding (95.8%) were supported by the public, and pharmaceutical companies only supported 15.5%. Funding supported most of the basic science T100 studies (96%, 24/25), but only 43.5% of clinical articles.

All of the clinical articles were assigned a level of evidence from 1 to 5 (**Figure 5**). Level 2b (47.3%) was the most frequent level of evidence, with a median of 298 citations per article. There were 16 studies each at level 1b and 3b. Only 1 and 4 T100 cited articles were assigned to level 1a and 2a, respectively. There was no significant association between citation index and level of evidence (P = 0.847). In addition, the evidence level was not strongly correlated with overall

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

number of citations (r=-0.11, p=0.345), citation index (r=-0.08, p=0.500), or year of publication (r=-0.16, p=0.174).

Discussion

The present study is the first to identify, rank and characterize the T100 articles in the field of AKI. The results reveal important advances and prevalent areas of interest in research about AKI, and may help physicians and scientists understand and design future research. The present study also provides quantitative information about authors, institutions, and journals that helps to identify classic works and high-impact journals.

Bibliometric analysis is a tool that quantifies the characteristics and scholarly impact of citation classics. Citation analysis, one common bibliometric method, can help authors to recognize important advances, and add a useful perspective on historical developments in a specific field. Understanding the characteristics inherent to highly cited works could help researchers who wish to publish effectively¹³. Despite some disadvantages in the assessment of article quality based simply on citation rating, it remains the most widely-accepted method currently available to judge the merits of a paper or journal¹⁴. Citation analysis is often used by journals to attract manuscripts with high citation potential. Currently, citation analysis of top cited articles is widespread and reported in various medical disciplines. However, there has been no citation analysis of AKI, which is a major global health issue associated with increased medical cost, and poor short- and long- term outcomes. In addition, the prevention, diagnosis, and treatment of AKI has become a rapidly developing specialty in recent years. This development is evidenced by the increasing number of related studies in the scientific literature. Identifying the classic articles that have contributed to progress in AKI research will help to understand the history and development of AKI and design future studies. However, little work has been conducted to recognize these important papers. The present study is the first to analyze the top article citations in AKI, and will help readers or authors to recognize the quality of the research, discoveries, and the trends steering AKI.

An article has more time to be cited with increasing age, and "older" articles are more likely to attain more citations, purely because of their longer citable period. However, in this analysis, most of the T100 articles (67%) were published between 2001 and 2009. This result is not consistent with most other citation analyses, in which the peak period for citation is from 1980 to 1995. However, it is consistent with recent research in the field of cardiovascular diseases¹⁵. In addition, to overcome the effect of publication time on citations, we also assessed the citation index as a measure of the

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

BMJ Open

true impact of an article independent of short-lived trends. The results remained consistent indicating that the number of AKI articles increased, and this field attracted more resources and materials in the past 10 years, with the growing incidence of AKI, because of increasing exposure to contrast media or cardiothoracic surgery.

Some previous studies have demonstrated that high IF journals are attractive to authors, which in turn preferentially attract more submissions from the authors. Therefore, the IF of a journal is the strongest indicator for citations, and most top cited articles are published in high IF journals¹⁶⁻¹⁸. The present study also demonstrated that IF was positively correlated with the number of T100 articles, and the number of citations. However, other than the high-IF general medical journal the-New England Journal of Medicine, which published 17 T100 articles, the most productive journals were the Journal of the American Society of Nephrology and Kidney International, which have relatively low IFs. This result indicates an increasing trend of publishing highly influential articles in specialty journals dedicated solely to research into renal diseases such as AKI rather than general medical journals (e.g. Lancet or JAMA). These results are consistent agree with previous studies focusing on other diseases^{10 15}. Our results also revealed that no T100 basic research study focusing on AKI was published in Nature, Cell, or Science, the highest influent journals on basic research. This result is in contrast to hypertension studies, among which highly cited basic research was published more frequently in Nature (6 articles) and Cell (4 articles)¹⁰.

Fifteen countries contributed to the T100 cited articles, led by the USA, which is similar to the T100 articles in the fields of cardiac surgery¹¹, sepsis¹⁹, and others^{15 20 21}. This finding confirms the influence of the USA in relation to AKI research worldwide and may be related to the large population and abundant financial resources available to the scientific community in the USA. In addition, among the top 13 institutions, 9 (69%) are in USA. The leading institution is Brigham and Women's Hospital, which published 9 T100 cited articles with total citations number of 4263. Furthermore, American authors tend to cite local papers and European authors tend to publish in American journals and USA reviewers prefer USA papers^{22 23}. In addition, European countries, like Italy and the UK, also demonstrated higher productivity. However, despite the rapid development of scientific research in recent years, Asian authors have not played a dominant role in AKI research since their contribution to research productivity is relatively low. This finding seems to conform to the phenomenon that "a country with better economic ranking has the higher quantity and quality of biomedical publications" ²⁴. A number of first or corresponding authors were represented more than

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

once on the list. This list of frequently-cited authors highlights some of the world's best-recognized experts in the field of AKI research. The most frequently-cited authors JV Bonventre and P Devarajan, with 5 and 6 articles, respectively, were associated with clinical articles.

Financial support from public foundations or commercial companies has greatly contributed to medical and public health research. In our study, more than half (57.7%) of T100 articles reported a source of funding support. Among them, 84.5% received funding from public institutions or national foundations, 4.2% from industry and 11.3% from both. Although, industry-funded research has been widely debated because of susceptibility to various biases, it has played and will continue to play a critical role in the research process²⁵. In another recent study, 24% of funding was from industry, which is higher than in the present study. However, 30% of reported funding was from public agencies, which is lower than ours¹⁹. This comparison indicates that government-funded entities have prioritized AKI, a global health issue impacting medical costs. The cost per 6-month AKI survivor was calculated to be $\$80\ 000^{26}$. Another reason for this discrepancy might be the lack of new drug development research in the present T100 articles, resulting in little funding from pharmaceutical companies. In addition, only 44% of clinical research received funding, while 96% of basic research received funding. These results confirm the key role of public funding in the generation of influential basic research. However, clinical research has bridged the gap between basic science and human health improvement, is heavily weighted towards biomedical science, and plays a special role in the fight against AKI by providing evidence for its treatment and diagnosis. High-quality clinical research is expensive, and in the future, it should receive more funding support.

Based on the advantages of clinical research mentioned above, more clinical studies have been performed to provide new insights into the prevention, biomarkers, diagnosis or treatment of AKI. In addition, a recent detailed bibliometric analysis suggests the rapid dissemination of clinical findings ²⁷. Thus, it is not surprising that most of the T100 articles (58%) in the present study are clinical research, consistent with analyses in other fields²⁸⁻³⁰. The mean citation number per clinical research article was higher than that of basic research articles (404 vs. 328). Among clinical studies, the most frequent type was prospective observational study (n=35), followed by RCT (n=16). Our limited survey, based on the analysis to identify the citation source for the top 3 T100 clinical studies, revealed that most of their citations (2/3) came from other original articles (both clinical and pre-clinical studies), with the rest of citations (1/3) in subsequent reviews, editorials, or

BMJ Open

meta-analyses. This distribution suggests that the conclusions of these highly cited clinical studies have stimulated much subsequent original research. Guidelines, reviews and meta-analyses (with 852, 362, and 267 mean citations per article, respectively) accounted for a high proportion (22%) of the list, which is a common finding in top citation assessments for any medical specialty. Authors frequently cite such publications as they convey outcome generalities of many single site studies. It is well recognized that levels of evidence will vary depending on the study designs. The goal of rating study designs and levels of evidence is to indicate the best available evidence for use in patient care. Among various study designs, RCTs provide the highest quality evidence for most clinical or interventional trials. The T100 articles included 16 RCTs, a lower proportion than other top medical articles, such as hypertension (24 RCTs).

A large majority of clinical research studies in the T100 cited articles included patients with AKI from any cause admitted to an intensive care unit. Among the research on specific causes of AKI, contrast-induced AKI in patients after cardiac catherization was the most common. It is not surprising that researchers have been increasingly interested in the field of biomarkers³¹, or therapy for contrast induced AKI³², with a large number of papers published, in parallel with the increasing use of cardiac catherization. Additionally, previous studies demonstrated that contrast-induced AKI is a common complication after procedures requiring contrast media, responsible for 11% of in-hospital AKI cases, and also associated with poor short- and long-term outcomes^{3 33}. In our T100 RCT studies, 50% focused on the therapy of contrast-induced AKI. However, more high-quality RCTs for other causes of AKI, such as cardiac surgery, are needed in the future.

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

This study also has some limitations. First, despite a meticulous search of Web of Science and consistent results also demonstrated in Scopus data, some studies might have been missed. Second, this type of study usually favors older published articles, but excludes some recently published high quality studies, a limitation related to the effect of time on citations. Third, using the number of citations alone can not quantify the value of contributions to the field. Therefore, papers that are important and influential, but have a lower citation frequency, might be missed. Fourth, the minimal effect of self-citation was also not considered in our study. Finally, the language of publication was restricted to English, which would have failed to capture landmark articles published in other languages.

Conclusions

Our analysis summarized of the most influential studies on AKI, and highlights research areas that require further investigation and development. Our analysis also provides an insight into the citation frequencies of the top cited articles on AKI and sheds light on the quality of the works, discoveries, and trends steering AKI research globally.

Contributors

Conception/Design: NT, YHL, PCH.

Collection and/or assembly of data: YHL, SQW, JHX, YL, JYC, PCH.

Data analysis and interpretation: YHL, SQW, JHX, YL, JYC.

Manuscript writing: YHL.

Manuscript revising: NT, YHL, SQW, GFL.

Final approval of the version to be published: All authors.

Funding

This study was supported by a grant from the National Natural Science Foundation of China (Grant no. 81270286). The funders had no role in the study design, data collection and analysis, decision to publish, or preparation of the manuscript. This work was not funded by any industry sponsors.

Competing interests

The authors declare that they have no competing interests.

Ethical approval

Not required.

Data sharing

No additional data available.

References

- 1. Huber M, Ozrazgat-Baslanti T, Thottakkara P, et al. Mortality and cost of acute and chronic kidney disease after vascular surgery. *Ann Vasc Surg* 2016;30:72-81
- 2. Hoste EA, Bagshaw SM, Bellomo R, et al. Epidemiology of acute kidney injury in critically ill patients: the multinational AKI-EPI study. *Intensive Care Med* 2015;41:1411-23.
- 3. Giacoppo D, Madhavan MV, Baber U, et al. Impact of Contrast-Induced Acute Kidney Injury After Percutaneous Coronary Intervention on Short- and Long-Term Outcomes: Pooled Analysis From the HORIZONS-AMI and ACUITY Trials. *Circ Cardiovasc Interv* 2015;8:e002475.
- 4. Horkan CM, Purtle SW, Mendu ML, et al. The association of acute kidney injury in the critically ill and postdischarge outcomes: a cohort study. *Crit Care Med* 2015;43:354-64.
- Eyre-Walker A, Stoletzki N. The assessment of science: the relative merits of post-publication review, the impact factor, and the number of citations. *PLoS Biol* 2013;11:e1001675.
- 6. E G. Citation analysis as a tool in journal evaluation. *Science* 1972;178:471-9.
- 7. Sharma B, Lawrence DW. Top-cited articles in traumatic brain injury. *Front Hum Neurosci* 2014;8:879.
- 8. Pagni M, Khan NR, Cohen HL, et al. Highly cited works in radiology: the top 100 cited articles in radiologic journals. *Acad Radiol* 2014;21:1056-66.
- 9. O'Kelly F, Nason GJ, McLoughlin LC, et al. A comparative bibliometric analysis of the top 150 cited papers in hypospadiology (1945-2013). *J Pediatr Urol* 2015;11:1-11
- 10. Oh YS, Galis ZS. Anatomy of success: the top 100 cited scientific reports focused on hypertension research. *Hypertension* 2014;63:641-7.
- 11. O'Sullivan KE, Kelly JC, Hurley JP. The 100 most cited publications in cardiac surgery: a bibliometric analysis. *Ir J Med Sci* 2015;184:91-9.
- 12. Phillips B, Ball C, Sackett D, et al. Levels of evidence. Available from URL: http://www.cebm.net/index.aspx?o=1025. Accessed on 1 October 2013.
- 13. Allen L, Jones C, Dolby K, et al. Looking for landmarks: the role of expert review and bibliometric analysis in evaluating scientific publication outputs. *PloS One* 2009;4:e5910.
- 14. D A. The counting house. *Nature* 2002;415:726-9.
- 15. Shuaib W, Khan MS, Shahid H, et al. Bibliometric analysis of the top 100 cited cardiovascular articles. *Am J Cardiol* 2015;115:972-81.
- 16. E G. The history and meaning of the journal impact factor. *JAMA* 2006;295:90-3.
- 17. Fendrich V, Rothmund M. Surgical research in Germany--an international comparison. *Chirurg* 2010;81:328-33.
- 18. FM C. National bias- a comparison of citation practices by health professionals. *Bull Med Libr Assoc* 1990;78:376-82.
- 19. Tao T, Zhao X, Lou J, et al. The top cited clinical research articles on sepsis: a bibliometric analysis. *Crit Care* 2012;16:R110.
- 20. Nason GJ, Tareen F, Mortell A. The top 100 cited articles in urology: An update. *Can Urol Assoc J* 2013;7:E16-24.
- 21. Gu W, Yuan Y, Yang H, et al. A bibliometric analysis of the 100 most influential papers on COPD. *Int J Chron Obstruct Pulmon Dis* 2015;10:667-76.
- 22. Campbell FM. National bias: a comparison of citation practices by health professionals. Bull

Med Libr Assoc 1990;78:376-82.

- 23. AM L. US and non-US submissions: an analysis of reviewer bias. JAMA 1998;280:246-7.
 - 24. FE N. Publication outcome of research funding by the Danish Heart Foundation 1988-1990. *Ugeskr Laeger* 1998;160:4644-8.
 - 25. Rowe S, Alexander N, Clydesdale FM, et al. Funding food science and nutrition research: financial conflicts and scientific integrity. *Am J Clin Nutr* 2009;89:1285-91.
 - 26. Korkeila M RE, Takala J. Costs of care, long-term prognosis and quality of life in patients requiring renal replacement therapy during intensive care. *Intensive Care Med* 2000;26:1824-31.
 - 27. Rosas SR, Schouten JT, Cope MT, et al. Modeling the dissemination and uptake of clinical trials results. *Res Eval* 2013;22:179-86.
 - 28. Piolanti N, Nesti A, Andreani L, et al. The fifty most cited Italian articles in the orthopaedic literature. *Musculoskelet Surg* 2015;99:105-11.
 - 29. Aminian A, Daigle CR, Brethauer SA, et al. Citation classics: top 50 cited articles in bariatric and metabolic surgery. *Surg Obes Relat Dis* 2014;10:898-905.
- 30. Cao F, Li J, Li A, et al. Citation classics in acute pancreatitis. Pancreatology 2012;12:325-30.
- 31. Liu YH, Liu Y, Chen JY, et al. LDL cholesterol as a novel risk factor for contrast-induced acute kidney injury in patients undergoing percutaneous coronary intervention. *Atherosclerosis* 2014;237:453-9.
- 32. Bei WJ, Duan CY, Chen JY, et al. Remote Ischemic Conditioning for Preventing Contrast-Induced Acute Kidney Injury in Patients Undergoing Percutaneous Coronary Interventions/Coronary Angiography: A Meta-Analysis of Randomized Controlled Trials. *J Cardiovasc Pharmacol Ther* 2016;21:53-63.
- 33. Nash K, Hafeez A, Hou S. Hospital-acquired renal insufficiency. *Am J Kidney Dis* 2002;39:930-6.

BMJ Open

Table and Figure legends

 Table 1. Bibliometric information associated with the Top 20 of the Top 100 cited articles on acute

 kidney injury.

Table 2. Journals in which the T100 articles were published.

 Table 3. Authors with two or more top-cited articles.

Table 4. Institutions with two or more top cited articles on acute kidney injury.

Figure 1. Numbers of articles published and number of citations in 5 years periods.

Figure 2. Countries of origin of the top100 cited articles on acute kidney injury.

Figure 3. Distributions of research type of the top 100 cited articles on acute kidney injury.

Figure 4. Funding source of the top 100 cited research studies.

Figure 5. Levels of evidence of the top 100 cited clinical articles.

Rank	Authors	Title	Journals	Years	Times Cited (Web)	Citation Index (Web)	Times Cited (Scopus)	Citation Index (Scopus)	PMID
I	Bellomo, R et al	Acute renal failure-definition, outcome measures, animal models, fluid therapy and information technology needs: the Second International Consensus Conference of the Acute Dialysis Quality Initiative (ADQI) Group	Critical Care	2004	1971	164.25	2219	184.92	15312219
2	Mehta, RL et al	Acute Kidney Injury Network: report of an initiative to improve outcomes in acute kidney injury	Critical Care	2007	1652	183.56	1725	191.67	17331245
3	Uchino, S et al	Acute renal failure in critically ill patients-A multinational, multicenter study	JAMA-Journal of the American Medical Association	2005	1297	117.91	1489	135.36	16106006
1	Thadhani, R et al	Medical progress - Acute renal failure	New England Journal of Medicine	1996	963	48.15	1139	56.95	8618585
5	Mishra, J et al	Neutrophil gelatinase-associated lipocalin (NGAL) as a biomarker for acute renal injury	Lancet	2005	949	86.27	1079	98.09	15811456

BMJ Open

3 		after cardiac surgery							
6	Chertow, GM et al	Acute kidney injury, mortality, length of stay,	Journal of the American	2005	893	81.18	1035	94.09	16177006
3		and costs in hospitalized patients	Society of Nephrology						
0 7 1 2 3 4 5 6 7	Ronco, C et al	Effects of different doses in continuous veno-venous haemofiltration on outcomes of acute renal failure: a prospective randomised trial	Lancet	2000	816	51.00	1032	64.5	10892761
8 8 9 20 21	Paller, MS et al	Oxygen free radicals in ischemic acute renal failure in the rat	Journal of Clinical Investigation	1984	814	25.44	575	17.97	6434591
22 9 23	McCullough, PA et	Acute renal failure after coronary intervention:	American Journal of	1997	799	42.05	1016	53.47	9375704
24 25 26 27	al	Incidence, risk factors, and relationship to mortality	Medicine						
28 10 29 30 31 32	Levy, EM et al	The effect of acute renal failure on mortality - A cohort analysis	JAMA- Journal of the American Medical Association	1996	793	39.65	998	49.9	8622223
33 34 11 35 36 37 38	Rihal, CS et al	Incidence and prognostic importance of acute renal failure after percutaneous coronary intervention	Circulation	2002	691	49.36	877	62.64	12010907
89 40 12 41 42 43 44 45 46	Solomon, R et al	Effects of saline, mannitol, and furosemide to	New England Journal of	1994	684	31.09	905	41.14	7969280

47 48 10

1 2 3										
4 5			prevent acute decreases in renal	Medicine						
6 7			function induced by radiocontrast agents							
8 9	13	Mehran, R et al	A simple risk score for prediction of contrast-	Journal of the American	2004	677	56.42	844	70.33	15464318
10 11			induced nephropathy after percutaneous	College of Cardiology						
12 13			coronary intervention- Development and initial							
14 15			validation							
16 17	14	Mishra, J et al	Identification of neutrophil	Journal	2003	645	49.62	735	56.54	14514731
18 19			gelatinase-associated lipocalin as a novel early	of the American Society of N						
20 21			urinary biomarker for ischemic renal injury	ephrology						
22 23	15	Chertow, GM et al	Independent association between acute renal	American Journal of	1998	630	35.00	747	41.5	9576407
24			failure and mortality following cardiac surgery	Medicine						
25 26 27	16	Parfrey, PS	Contrast material-induced renal failure in	New England Journal of	1989	618	22.89	635	23.52	2643041
28 29		et al	patients with diabetes mellitus, renal	Medicine						
30 31			insufficiency, or both. A prospective controlled							
32 33			study							
34 35	17	Aspelin, P et al	Nephrotoxic effects in high-risk patients	New England Journal of	2003	575	44.23	758	58.31	12571256
36 37			undergoing angiography.	Medicine						
38 39	18	Brivet, FG et al	Acute renal failure in intensive care units -	Critical Care Medicine	1996	538	26.90	632	31.6	8605788
40 41 -			Causes, outcome, and prognostic factors of							
42 43 44 45 46			.zəigolondəər <u>າຍປະຫາຮອດເຈີດທີ່ທີ່</u> ເຄັນໄດ້.cpຫຼືຫຼ	bri, (fitabi bota ixaturi bata(e i requ	3430\$1 (2 14jaf	anietate para anti-	cteq by cop	Prote		

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de I Enseignement Superieur (ABES) Protected by כאַצענוְמַוּשָׁ*וּוּשָׁוּוּשָׁוּוּשָׁוּפּוּוּפּוּפּוּיפּא*נוּפּוּפּריפּאנפּאנפּן אָמוּאַוּטָט. אָ*ו*וּניאוּאַשָּ אַמַבּנּוּחָאָפּריפוּטוי 2025 at Agence Bibliographique de l

1 2										
3 4 5			hospital mortality: A prospective, multicenter							
5 6 7			study							
8 9	19	Togel, F et al	Administered mesenchymal stem cells protect	American Journal of	2005	524	47.64	625	56.82	15713913
10 11			against ischemic acute renal failure through	Physiology-Renal						
12 13			differentiation-independent mechanisms	Physiology						
14 15	20	Merten, GJ et al	Prevention of contrast-induced nephropathy	JAMA- Journal of the	2004	513	42.75	714	59.5	15150204
16 17			with sodium bicarbonate - A randomized	American Medical						
18 19_			controlled trial	Association						
20 21	See Ta	able S1 for a compl	lete list of T100.							
22 23										
24 25				Association						
26 27										
28 29 30										
30 31 32										
33 34										
34 35 36										
37										
38 39										
40 41										
42										
43 44										
45 46			Ear near region only chit	n://bmianan.hmi.com/site	about/muide	linas.#h	atranla cara a			
47	1.00	anhudnifauara aa	ທີ່ທີ່ດີ,∯ໂຜີລູ່ເພື່ອລູກອີຣີເຫັນປີອີ. ເວັ ທີ່ທີ່ດີ,∯ໂຜີລູ່ເພື່ອລູກອີຣີເຫັນປີອີ. technologies.	38A) rusinsqu2 framengiasr	13				and to the the	ado awa
48 ⊿q	l əb	See Biblioaraphiane	nəpA ts 7202, e ənuL no \moɔ.imd.nəqoimd\\!qt	ily 2016. Downloaded trom ht	nl. 72 no 068)	110-9102.	-nanoimd\85	rt Of as badzil	n: first nub	anO I.MA

Table 2. Journals in which the T100 articles were published

	No. of	Impact	5-Year
Journal	Articles (Citations)	Factor	Impact Factor
New England Journal of Medicine	17 (7249)	55.87	54.39
Journal of the American Society of Nephrology	16 (5470)	9.34	5.47
Kidney International	16 (5157)	8.56	7.89
Journal of Clinical Investigation	11 (3930)	13.22	14.05
Lancet	7 (3194)	45.22	42.72
JAMA- Journal of the American Medical Associa	tion 5 (3095)	35.29	31.03
American Journal of Medicine	5 (2138)	5.00	5.26
Critical Care Medicine	5 (1935)	6.31	6.29
American Journal of Physiology-Renal Physiolog	gy 4 (1252)	3.25	3.51
Critical Care	4 (4379)	4.48	5.14
Archives of Internal Medicine	4 (1079)	17.33	13.10
Journal of the American College of Cardiology	3 (1238)	16.50	14.10
Medicine	3 (971)	5.72	5.29
Annals of Internal Medicine	3 (864)	17.8	17.47
Proceedings of the National Academy	2 (683)	9.67	10.56
of Sciences of the United States of America			
American Journal of Kidney Diseases	2 (627)	5.90	5.56
Clinical Journal of the American Society of	2 (604)	4.61	5.47
Nephrology			
American Journal of Cardiology	2 (482)	3.28	3.35

Notes: The journals that only published one of the T100 articles were shown below. Values given in parentheses were number of articles, impact factors and the corresponding citations, respectively. Circulation (1, 14.43, 691); Intensive Care Medicine (1, 7.21, 349); Nephrology Dialysis Transplantation (1, 3.58, 304); Anesthesiology (1, 5.88, 263); Circulation Research (1, 11.02, 243); Journal of Thoracic and Cardiovascular Surgery (1, 4.17, 229); International Journal of Molecular Medicine (1, 2.09, 228); American Journal of Physiology (1, NA, 227); Clinical Infectious Diseases (1, 8.89, 226); Annals of Surgery (1, 8.33, 226); Annals of Thoracic Surgery (1, 3.85, 221); European Radiology (1, 4.01, 220).

Page 21 of 44

BMJ Open

	Author	No. of articles	First	Correspond	Other	Citations (First and Correspond)	Total citations
	Bonventre, JV	10	5	9	1	4263	4527
	Devarajan, P	8	1	5	3	2464	3428
i	Chertow, GM	6	3	5	1	2353	2579
	Mehta, RL	6	4	3	1	2757	4728
i	Parikh, CR	4	2	4		996	813
	Marenzi, G	3	3	3		813	1095
,	Schrier, RW	3	2	3		1095	1634
1	Camussi, G	2		2		452	452
)	Dangas, G	2	1	2		934	934
0	Kellum, JA	2				1788	1788
1	McCullough, PA	2	2	2		1101	1101
2	Schiffl, H	2	2	2		677	677
3	Westenfelder, C	2		2		761	761
4	Parfrey, PS	2	1	2	1	892	892
5	Bates, DW	2	1	1	1	226	1119
6	Coca, S. G	2	2			486	486

Page 22 of 44

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de I Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

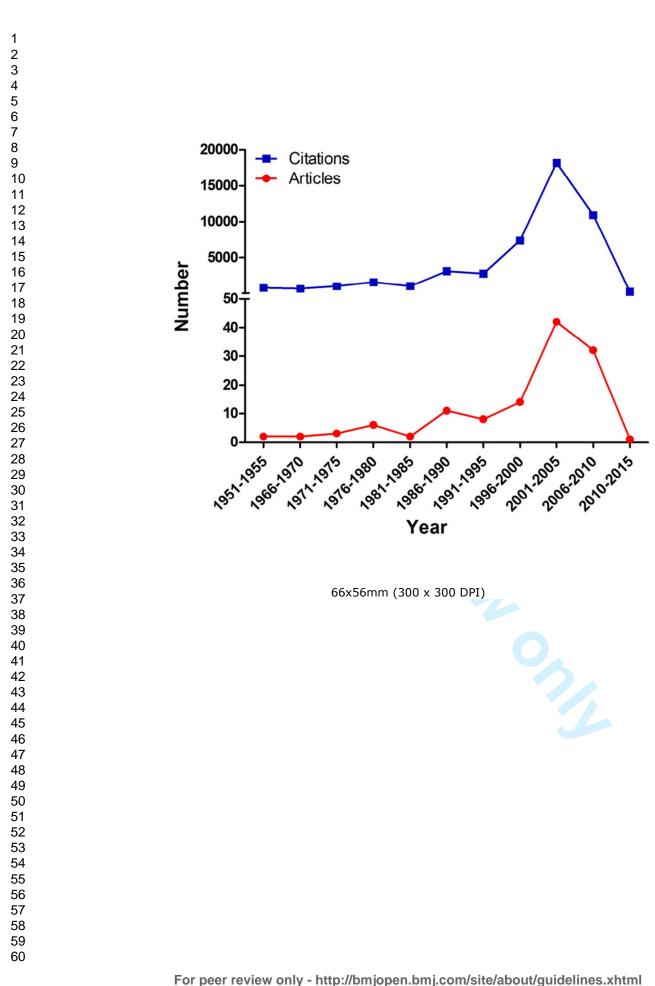
BMJ Open

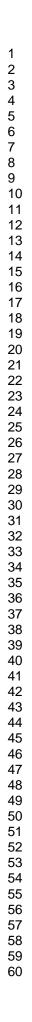
Table 4. Institutions with two or more top	o cited articles on acute kidney injury
--	---

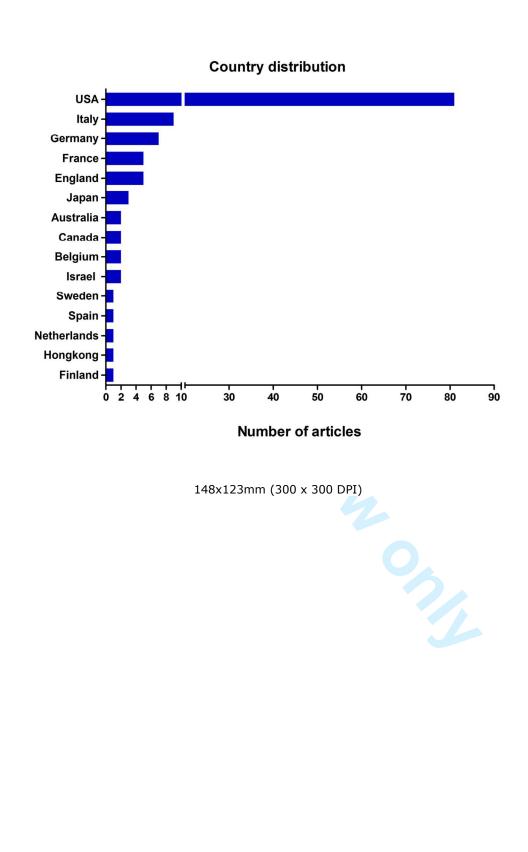
Rank	Institution	No. of Articles	Citations
1	Brigham and Women's Hospital, Boston, USA	9	4263
2	Cincinnati Children's Hospital Medical Center, Cincinnati, USA	5	2464
3	University of California, San Francisco, USA.	5	2353
4	Yale University, West Haven, USA	4	996
5	University of California, San Diego, USA	3	2757
6	The University of Milan, Milan, Italy	3	813
7	University of Colorado, Denver, USA	3	1095
8	University of Torino, Torino, Italy	2	452
9	Columbia University, New York, USA	2	934
10	William Beaumont Hospital, Royal Oak, USA	2	1101
11	University of Munich, Munich, Germany	2	677
12	Veterans Affairs medical center, Salt Lake City, USA	2	761
13	Memorial University of Newfoundland, City of Saint John, Canada	2	892

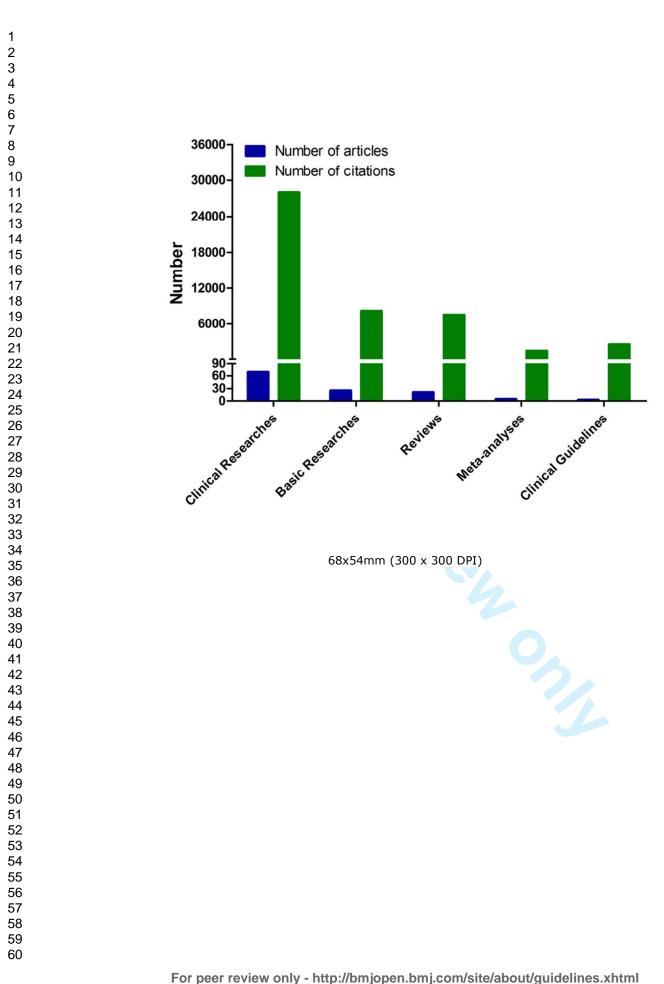
Indiana, Cu, I

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

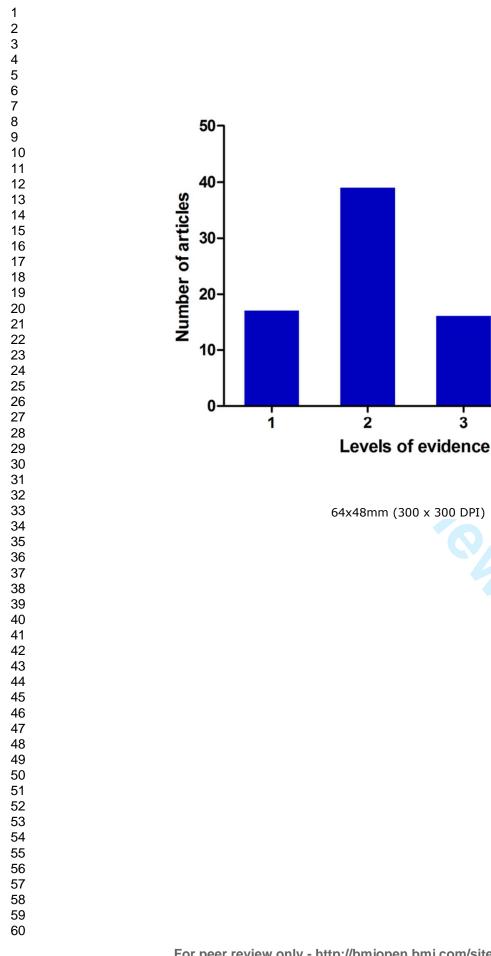




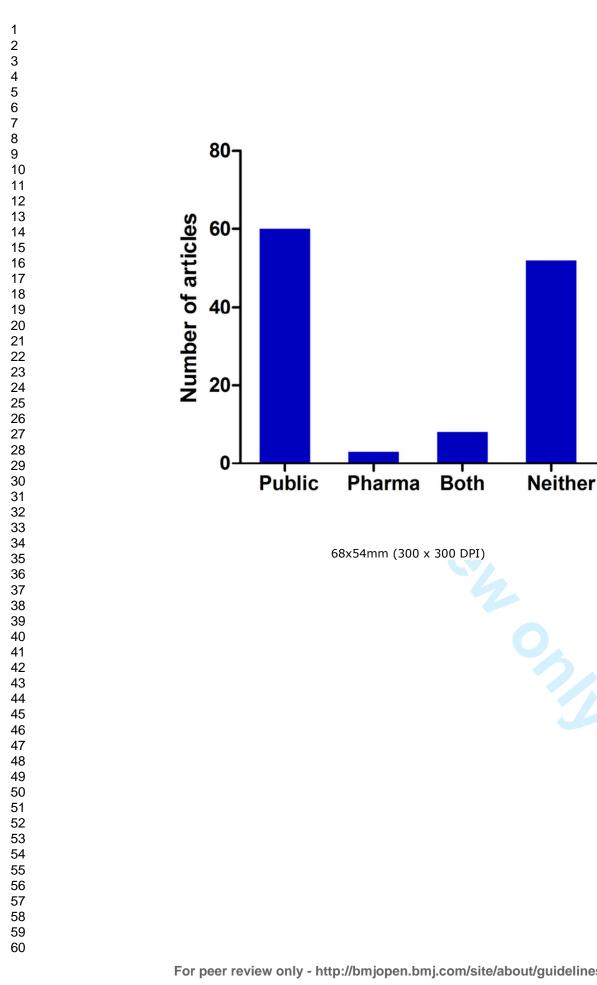




4



For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml



2	
2	
3	
4	
5	
6	
7	
ς Ω	
0	
9	
10	
11	
12	
13	
14	
2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 10 10 10 10 10 10 10 10 10 10 10 10 10	
16	
10	
1/	
18	
19	
20	
21	
22	
23	
24	
27 25	
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39	
26	
27	
28	
29	
30	
31	
32	
32	
24	
04 05	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
<u>1</u> 0	

Rank	Authors	Title	Journal	Year	Times Cited (Web)	Citation Index (Web)	Times Cited (Scoups)	Citation Index (Scoups)	PMID
21	Palevsky, PM et al	Intensity of renal support in critically ill patients with acute kidney injury	New England Journal of Medicine	2008	510	63.75	607	75.88	18492867
22	Oliver, J et al	The pathogenesis of acute renal failure associated with traumatic and toxic injury; renal ischemia, nephrotoxic damage and the ischemic episode		1951	498	7.66	NA	NA	14897900
23	Hoste, EA et al	RIFLE criteria for acute kidney injury are associated with hospital mortality in critically ill patients: a cohort analysis		2006	491	49.10	652	65.2	16696865
24	Kelly, KJ et al	Intercellular adhesion molecule-1-deficient mice are protected against ischemic renal injury	Journal of Clinical Investigation	1996	471	23.55	501	25.05	8613529
25	Schrier, RW et al	Mechanisms of disease: Acute renal failure and sepsis	New England Journal of Medicine	2004	465	38.75	251	20.92	15247356

Table S1. Bibliometric information of the other T100 articles in acute kidney injury which were not shown in Table 1

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de I Enseignement Superieur (ABES) Imping, Al training, and similar technologies.

BMJ Open

26	Liano, F et al	Epidemiology of acute renal failure: A prospective, multicenter, community-based study	Kidney International	1996	464	23.20	563	28.15	8872955
27	Lameire, N et al	Acute renal failure	Lancet	2005	439	39.91	569	51.73	15680458
28	Metnitz, PGH et al	Effect of acute renal failure requiring renal replacement therapy on outcome in critically ill patients	Critical Care Medicine	2002	438	31.29	534	38.14	12352040
29	Grossman, RA et al	Nontraumatic rhabdomyolysis and acute renal failure	New England Journal of Medicine	1974	433	10.31	215	5.12	4423658
30	Star, RA et al	Treatment of acute renal failure	Kidney International	1998	428	23.78	501	27.83	9853246
31	Schiffl, H et al	Daily hemodialysis and the outcome of acute renal failure	New England Journal of Medicine	2002	415	29.64	549	39.21	11821500
32	Hollenbe.NK et al	Acute oliguric renal failure in man: evidence for preferential renal cortical ischemia	Medicine	1968	409	8.52	105	2.19	5715692
33	Uchino, S et al	An assessment of the RIFLE criteria for acute renal failure in hospitalized patients	Critical Care Medicine	2006	407	40.70	475	47.5	16715038
ibliogra	a June 9, 2025 at Agence B milar technologies.	ly 2016. Downloaded from http://mjopen.bmj.com/ seignement Superieur (ABES) seigned kooksayalaaaningi, Al training, abd si	uL 75 no 069110-9102-neqoimd/9611.01 a ra guniobaniquit dubiaide anglaguada anglaguag	nes.xhtml æ pəysijqno	y terit :n9q0 LN	18			

34	Bonventre, JV et al	Recent advances in the pathophysiology of	Journalof the American Society	2003	401	30.85	448	34.46	12874476
		ischemic acute renal failure	of Nephrology						
35	Haase, M et al	Accuracy of Neutrophil	American Journal of	2009	394	56.29	479	68.43	19850388
		Gelatinase-Associated Lipocalin (NGAL)	Kidney Diseases						
		in Diagnosis and Prognosis in Acute							
		Kidney Injury: A Systematic Review and							
		Meta-analysis							
36	Fouque, D et al	A proposed nomenclature and diagnostic	Kidney International	2008	392	49.00	454	56.75	18094682
		criteria for protein-energy wasting in acute							
		and chronic kidney disease							
37	Herget-Rosenthal, S et	Early detection of acute renal failure by	Kidney International	2004	384	32.00	488	40.67	15327406
	al	serum cystatin C							
38	Mueller, C et al	Prevention of contrast media-associated	Archives of Internal Medicine	2002	372	26.57	541	38.64	11822926
		nephropathy - Randomized comparison of							
		2 hydration regimens in 1620 patients							
		undergoing coronary angioplasty							
39	Morigi, M et al	Mesenchymal stem cells are renotropic,	Journal of the American	2004	369	30.75	433	36.08	15213267

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de I Enseignement Superieur (ABES) Importation and similar technologies.

BMJ Open

			helping to repair the kidney and improve	Society of Nephrology						
			function in acute renal failure							
	40	Bonventre, JV et al	Mechanisms of ischemic acute renal failure	Kidney International	1993	366	15.91	359	15.61	8510397
	41	Kelly, KJ et al	Antibody to intercellular adhesion	Proceedings of the National	1994	354	16.09	345	15.68	7904759
			molecule 1 protects the kidney against	Academy of Sciences of the						
			ischemic injury	United States of America						
	42	Devarajan, P et al	Update on mechanisms of ischemic acute	Journal of the American	2006	351	35.10	370	37	16707563
			kidney injury	Society of Nephrology						
	43	de Mendonca, A et al	Acute renal failure in the ICU: risk factors	Intensive Care Medicine	2000	349	21.81	436	27.25	10990106
			and outcome evaluated by the SOFA score							
	44	Abel, RM et al	Improved survival from acute renal failure	New England Journal of	1973	345	8.02	133	3.09	4631743
			after treatment with intravenous essential	Medicine						
			L-amino acids and glucose. Results of a							
			prospective, double-blind study							
	45	Humes, HD et al	Epidermal growth factor enhances renal	Journal of Clinical Investigation	1989	336	12.44	217	8.04	2592559
			tubule cell regeneration and repair and							
			accelerates the recovery of renal function							
l on onbuid-	60.000	milar technologies.	ily 2016. Downloaded from http://bmjopen.bmj.com/ seignement Superieur (ABES) รูปรูโสรสุปุญร์สุมธิญญัญรูป fraining, and si	ikdiekiektyskebinistrepierskaagoimsk Ev	nes.xhtml	d 10.00 000 de				
l ab aupidger	noildi8	on June 9. 2025 at Agence F	Vmos.imd.nagoimd//:attd mosted from Vil	ul. 75 no 0£9110-9102-n9aoimd\9511,01 s	e bədzildu	n tarit :neaO UN	18			

1	
2	
3 4	
5	
6	
7 8 9 10	
8	
9 10	
11	
12	
13	
14	
15	
13 14 15 16 17 18 19	
18	
19	
20	
21 22	
23	
24	
25	
26 27	
27 28	
29	
30	
31	
32	
33 34	
32 33 34 35 36 37 38	
36	
37	
38 39	
39 40	
41	
42	
43	
44 45	
45 46	
47	
48	
٨Q	

		in postischemic acute renal failure							
46	Bonventre, JV et al	Ischemic acute renal failure: An	Kidney International	2004	335	27.92	368	30.67	15253693
		inflammatory disease?							
47	Schrier, RW et al	Acute renal failure: definitions, diagnosis,	Journal of Clinical Investigation	2004	332	27.67	376	31.33	15232604
		pathogenesis, and therapy							
48	Kawaida, K et al	Hepatocyte growth factor prevents acute	Proceedings of the National	1994	329	14.95	309	14.05	8183913
		renal failure and accelerates renal	Academy of Sciences of the						
		regeneration in mice	United States of America						
49	Ricci, Z. et al	The RIFLE criteria and mortality in acute	Kidney International	2008	325	40.63	374	46.75	18160961
		kidney injury: A systematic review							
50	Marenzi, G et al	N-acetylcysteine and contrast-induced	New England Journal of	2006	323	32.30	402	40.2	16807414
		nephropathy in primary angioplasty	Medicine						
51	Akcan-Arikan, A et al	Modified RIFLE criteria in critically ill	Kidney International	2007	320	35.56	368	40.89	17396113
		children with acute kidney injury							
52	Ishani, Areef et al	Acute Kidney Injury Increases Risk of	Journal of the American	2009	319	45.57	364	52	19020007
		ESRD among Elderly	Society of Nephrology						
53	Mehta, RL et al	Spectrum of acute renal failure in the	Kidney International	2004	315	26.25	368	30.67	15458458

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) Imping, Al training, and similar technologies.

BMJ Open

al cardiac surgery Society of Nephrology 55 Mehta, RL et al A randomized clinical trial of continuous kidney International versus intermittent dialysis for acute renal failure 2001 309 20.60 401 26.73 115 56 Hakim, RM et al Effect of the dialysis membrane in the reatment of patients with acute renal failure New England Journal of Medicine 1994 307 13.95 287 13.05 793 57 Conlon, PJ et al Acute renal failure following cardiac surgery Nephrology Dialysis 1999 304 17.88 395 23.24 103 58a Nickolas, Thomas Let Sensitivity and specificity of a single emergency department measurement of urinary neutrophil gelatinase-associated lipocalin for diagnosing acute kidney Annals of Internal Medicine 2008 303 37.88 344 8.82 185			intensive care unit: The PICARD experience							
55Mehta, RL et alA randomized clinical trial of continuous versus intermittent dialysis for acute renal failureKidney International200130920.6040126.7311556Hakim, RM et alEffect of the dialysis membrane in the treatment of patients with acute renal failureNew England Journal of Medicine199430713.9528713.0579357Conlon, PJ et alAcute renal failure following cardia surgeryNephrology Dialysis Transplantation199930417.8839523.2410358aNickolas, Thomas L et al <br< th=""><th>54</th><th></th><th></th><th></th><th>2006</th><th>310</th><th>31.00</th><th>341</th><th>34.1</th><th>1769918</th></br<>	54				2006	310	31.00	341	34.1	1769918
failure	55		A randomized clinical trial of continuous		2001	309	20.60	401	26.73	1153211
Image: State in the state of patients with acute renal Medicine failure Image: State in the state in t	56	Hakim RM et al	failure	New England Journal of	1994	307	13 95	287	13.05	7935703
Surgery Transplantation 58a Nickolas, Thomas L et Sensitivity and specificity of a single Annals of Internal Medicine 2008 303 37.88 344 8.82 185 al emergency department measurement of urinary neutrophil gelatinase-associated lipocalin for diagnosing acute kidney internal Medicine 2008 303 37.88 344 8.82 185	50	Hakini, Kwi et al	treatment of patients with acute renal	-	1777	507	13.75	207	15.05	199910.
al emergency department measurement of urinary neutrophil gelatinase-associated lipocalin for diagnosing acute kidney	57	Conlon, PJ et al			1999	304	17.88	395	23.24	1034435
injury	58a	·	emergency department measurement of urinary neutrophil gelatinase-associated	Annals of Internal Medicine	2008	303	37.88	344	8.82	1851992

58b	Anderson, RJ et al	Nonoliguric acute renal failure	New England Journal of Medicine	1977	303	7.77	157	19.63	854045
59a	McCullough, Peter A et al	Contrast-induced acute kidney injury	Journal of the American College of Cardiology	2008	302	37.75	366	5.81	18402894
59b	Zager, RA et al	Rhabdomyolysis and myohemoglobinuric acute renal failure	Kidney International	1996	302	15.10	372	18.6	8821813
59c	Swann, RC et al	The clinical course of acute renal failure	Medicine	1953	302	4.79	2	0.25	13054209
60	Better, OS et al	Early management of shock and prophylaxis of acute renal failure in traumatic rhabdomyolysis		1990	301	11.58	331	12.73	2407958
61	Miller, TR et al	Urinary diagnostic indices in acute renal failure: a prospective study	Annals of Internal Medicine	1978	298	7.84	163	4.29	666184
62	Xue, Jay L et al	Incidence and mortality of acute renal failure in Medicare beneficiaries, 1992 to 2001		2006	296	29.60	326	32.6	16495381
63	Bennett, Michael et al	Urine NGAL predicts severity of acute kidney injury after cardiac surgery: A		2008	294	36.75	344	43	18337554

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de I Enseignement Superieur (ABES) Importation and similar technologies.

BMJ Open

		prospective study							
64	Ostermann, Marlies et	Acute kidney injury in the intensive care	Critical Care Medicine	2007	288	32.00	324	36	1758148
	al	unit according to RIFLE							
65	Noiri, E et al	In vivo targeting of inducible NO synthase	Journal of Clinical Investigation	1996	277	13.85	272	13.6	863641
		with oligodeoxynucleotides protects rat							
		kidney against ischemia							
66	Oken, DE et al	Glycerol-induced hemoglobinuric acute	Journal of Clinical Investigation	1966	275	5.50	65	1.3	593536
		renal failure in the rat. I. Micropuncture							
		study of the development of oliguria							
67	Barrett, BJ et al	Preventing nephropathy induced by	New England Journal of	2006	274	27.40	347	34.7	1643676
		contrast medium	Medicine						
68	Parikh, C. R. et al	Urinary IL-18 is an early predictive	Kidney International	2006	267	26.70	309	30.9	1671034
		biomarker of acute kidney injury after							
		cardiac surgery							
69	Payen, Didier et al	A positive fluid balance is associated with	Critical Care	2008	265	33.13	309	38.63	1853302
		a worse outcome in patients with acute							
		renal failure							
6 .		seignement Superieur (ABES) seignement Superieur (ABES) ກ່ອງອີງເອດັ່ງອີງອີງອີງອີງອີງອີງອີງອີງອີງອີງອີງອີງອີງ	13						
iblioar	on June 9, 2025 at Agence B	Vmos.[md.neqo[md//gth most beds from http://bmjopen.bmj.com/	uL 7S no 0E8110-810S-n9qojmd\8E11.01	se bədzildı	Oben: first pi	BMJ			

70a	Ichimura, T et al	Kidney injury molecule-1: a tissue and urinary biomarker for	American Journal of Physiology-Renal Physiology	2004	264	22.00	330	27.5	14600030
		nephrotoxicant-induced renal injury							
70b	Bouman, CSC et al	Effects of early high-volume continuous venovenous hemofiltration on survival and recovery of renal function in intensive care patients with acute renal failure: A prospective rendomized trial		2002	264	18.86	303	21.64	12394945
71a	Wagener, Gebhard et	prospective, randomized trial Association between increases in urinary	Anesthesiology	2006	263	26.30	312	7.8	16931980
/14	al	neutrophil gelatinase-associated lipocalir		2000	203	20.50	512	7.0	10751700
		and acute renal dysfunction after adult							
		cardiac surgery							
71b	Koffler, A et al	Acute renal failure due to nontraumatic rhabdomyolysis	Annals of Internal Medicine	1976	263	6.58	117	11.7	937919
72a	Chertow, GM et al	Prognostic stratification in critically il	Archives of Internal Medicine	1995	262	12.48	282	12.82	7605152
		patients with acute renal failure requiring							
		dialysis							
b əupirlqsıgoildi	on June 9, 2025 at Agence B milar technologies.	/moɔ.[md.nəqo[md\/;dthd monged from http://bmjopen.bmj.com/ eignement Superieur (ABES) . dejated ໄດ້ປະການອ່າດີອີ່ນອງເປັນເປັນເປັນ ການ ເພື່ອນ	(luL 7S no 0E∂ΓΓ0-∂Γ0S-nəqoįmd\∂EΓΓ.0Γ en∃ ຊຈຸຂພງອຽຍທ່ຽນໄວກະ່∂Ωຊຍ່γγαγວγα∱ຊອາຊາຊາ	lines.xhtm se pəysilqr	J Open: first p	W8			

72b	Schiffl, H et al	Biocompatible membranes in acute renal	Lancet	1994	262	11.91	242	11.52	7914959
		failure: prospective case-controlled study							
73a	Birck, R et al	Acetylcysteine for prevention of contrast	Lancet	2003	260	20.00	388	10.49	12944058
		nephropathy: meta-analysis							
73b	Byrd, L et al	Radiocontrast-induced acute renal failure:	Medicine	1979	260	7.03	123	9.46	449662
		a clinical and pathophysiologic review							
74a	Marenzi, G et al	Contrast-induced nephropathy in patients	Journal of the American College	2004	259	21.58	297	33	15519007
		undergoing primary angioplasty for acute	of Cardiology						
		myocardial infarction							
74b	Ali, Tariq et al	Incidence and outcomes in acute kidney	Journal of the American	2007	259	28.78	297	24.75	17314324
		injury: A comprehensive population-based	Society of Nephrology						
		study							
75a	Sharples, EJ et al	Erythropoietin protects the kidney against	Journal of the American	2004	257	21.42	287	26.09	15284297
		the injury and dysfunction caused by	Society of Nephrology						
		ischemia-reperfusion							
75b	Dangas, G et al	Contrast-induced nephropathy after	American Journal of Cardiology	2005	257	23.36	309	25.75	15619387
		percutaneous coronary interventions in							
	milar technologies.	is bns (prining), Al training, Al training, and si	ra Posterend korleoppie anemaraei user	nes.xhtml					
aibliograg	on June 9, 2025 at Agence E	ly 2016. Downloaded from http://bmjopen.bmj.com/	u_	ss bədzildu	lJ Open: first p	BM			

		relation to chronic kidney disease and hemodynamic variables							
76	Thakar, CV et al	A clinical score to predict acute renal	Journal of the American	2005	254	23.09	304	27.64	15563569
		failure after cardiac surgery	Society of Nephrology						
7a	Mehta, RL et al	Diuretics, mortality, and nonrecovery of	JAMA- Journal of the American	2002	253	18.07	290	20.71	12444861
		renal function in acute renal failure	Medical Association						
7b	Coca, S. G et al	Biomarkers for the diagnosis and risk	Kidney International	2008	253	31.63	351	43.88	18094679
		stratification of acute kidney injury: A							
		systematic review							
7c	Bonventre, JV et al	Dedifferentiation and proliferation of	Journal of the American	2003	253	19.46	300	23.08	1276124
		surviving epithelial cells in acute renal	Society of Nephrology						
		failure							
78	Norman, DJ et al	Myolysis and acute renal failure in a	New England Journal of	1988	252	9.00	162	5.79	3275891
		heart-transplant recipient receiving	Medicine						
		lovastatin							
79	Tomita, K et al	Plasma endothelin levels in patients with	New England Journal of	1989	250	9.26	140	5.19	2677723
		acute renal failure	Medicine						

 I ab aupidensolarity 2016. Downloaded from http://dom.orgon.com/orginal.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (SBES) .

80	Lin, FM et al	Hematopoietic stem cells contribute to the	Journal of the American	2003	247	19.00	304	23.38	12707389
		regeneration of renal tubules after renal	Society of Nephrology						
		ischemia-reperfusion injury in mice							
81	Sutton, TA et al	Microvascular endothelial injury and	Kidney International	2002	244	17.43	271	19.36	12371954
		dysfunction during ischemic acute renal							
		failure							
82a	Arendshorst, WJ et al	Pathogenesis of acute renal failure	Circulation Research	1975	243	5.93	285	6.95	1192555
		following temporary renal ischemia in the							
		rat							_
82b	Parikh, CR et al	Urine IL-18 is an early diagnostic marker	Journal of the American	2005	243	22.09	83	7.55	16148039
		for acute kidney injury and predicts	Society of Nephrology						
		mortality in the intensive care unit							
83a	Kay, J et al	Acetylcysteine for prevention of acute		2003	239	18.38	327	25.15	12578487
		deterioration of renal function following	Medical Association						
		elective coronary angiography and							
		intervention - A randomized controlled trial							
83b	Shusterman, N et al	Risk factors and outcome of	American Journal of Medicine	1987	239	8.24	254	8.76	3605183
			lamianan hmi candsita lahaut lauidali	nos vhimi					
sipilograp		الy 2016. Downloaded from http://pmjopen.bmj.com/ seignement Superieur (BBES) seigned forextexter (BBEG) المان Al training, and s	13		vu Open: first p	18			

		hospital-acquired acute renal failure.							
		Clinical epidemiologic study							
83c	Bonventre, Joseph V	Cellular pathophysiology of ischemic acute	Journal of Clinical Investigation	2011	239	47.80	228	45.6	22045571
	et al	kidney injury							
84a	Togel, Florian et al	Vasculotropic, paracrine actions of infused	American Journal of	2007	237	26.33	284	18.93	17213465
		mesenchymal stem cells are important to	Physiology-Renal Physiology						
		the recovery from acute kidney injury							
84b	Burne, MJ et al	Identification of the CD4(+) T cell as a	Journal of Clinical Investigation	2001	237	15.80	267	26.7	11696572
		major pathogenic factor in ischemic acute							
		renal failure							
84c	Waikar, Sushrut S et al	Declining mortality in patients with acute	Journal of the American	2006	237	23.70	254	28.22	16495376
		renal failure, 1988 to 2002	Society of Nephrology						
85a	Melnikov, VY et al	Impaired IL-18 processing protects	Journal of Clinical Investigation	2001	236	15.73	253	9.37	11342578
		caspase-1-deficient mice from ischemic							
		acute renal failure							
85b	Cigarroa, RG et al	Dosing of contrast material to prevent	American Journal of Medicine	1989	236	8.74	282	18.8	2729314
		contrast nephropathy in patients with renal							
160.000	imilar technologies.	and the second	en e	nes.xhtml					
3iblioar	on June 9. 2025 at Agence F	ly 2016. Downloaded from http://bmjopen.bm/.	uL. 7S no 0E8110-810S-n9aoimd/8E11.01 (se bədzildu	a terit :neaO U	8			

86Vinsonneau,ChristopContinuous venovenous haemodiafiltrationLancet200623523.0031231.216876666e et alreal failur in patients with multiple-organ dystimation syndrome: a multicentre randomised triatreal failure in patients with multiple-organ dystimation syndrome: a multicentre randomised triat19762345.851213.0396169887Thrau, K et alAcute renal success. The unexpected logie of oliguria in acute renal failureLancet19762345.851213.0396169888aFirth, JD et alEndothelin: an important factor in acut renal failure?Lancet19882338.322769.86290338589aOcca, Steven G et al Matersan JustisLong-term Risk of Mortality and Other Adverse Outcomes After Acute Kidney Matersanal Diseases200923333.2911015.711934604289aMarenzi, G et alThe preventionPreventionNew England Journal of Medicine by hemofiltration200323117.7735527.3114523141			disease							
 88a Firth, JD et al Bodthelin: an important factor in acute Lancet renal failure? 88b Ford, Steven G et al Long-term Risk of Mortality and Other American Journal of Kidney Adverse Outcomes After Acute Kidney Diseases Injury: A Systematic Review and Meta-analysis 89 Marenzi, G et al The prevention of New England Journal of Medicine 	86	_	versus intermittent haemodialysis for acute renal failure in patients with multiple-organ dysfunction syndrome: a	Lancet	2006	235	23.50	312	31.2	16876666
 Renal failure? 88b Coca, Steven G et al Long-term Risk of Mortality and Other American Journal of Kidney Adverse Outcomes After Acute Kidney Diseases Injury: A Systematic Review and Meta-analysis 89 Marenzi, G et al The prevention of New England Journal of Review Medicine 	87	Thurau, K et al		American Journal of Medicine	1976	234	5.85	121	3.03	961698
 Adverse Outcomes After Acute Kidney Diseases Injury: A Systematic Review and Meta-analysis 89 Marenzi, G et al The prevention of New England Journal of 2003 231 17.77 355 27.31 14523141 radiocontrast-agent-induced nephropathy Medicine 	88a	Firth, JD et al		Lancet	1988	233	8.32	276	9.86	2903385
radiocontrast-agent-induced nephropathy Medicine	88b	Coca, Steven G et al	Adverse Outcomes After Acute Kidney Injury: A Systematic Review and		2009	233	33.29	110	15.71	19346042
	89	Marenzi, G et al	radiocontrast-agent-induced nephropathy	-	2003	231	17.77	355	27.31	14523141

90	Zanardo, G et al	Acute renal failure in the patient		1994	229	10.41	275	12.5	8196394
		undergoing cardiac operation. Prevalence, mortality rate, and main risk factors	Cardiovascular Surgery						
91a	Herrera, MB et al	Mesenchymal stem cells contribute to the	International Journal of	2004	228	19.00	273	39	15547670
		renal repair of acute tubular epithelial injury	Molecular Medicine						
91b	Bouchard, Josee et al	Fluid accumulation, survival and recovery	Kidney International	2009	228	32.57	264	22	19436332
		of kidney function in critically ill patients with acute kidney injury							
92a	Vaidya, VS et al	Urinary kidney injury molecule-1: a	American Journal of	2006	227	22.70	294	7.74	16174863
		sensitive quantitative biomarker for early	Physiology-Renal Physiology						
		detection of kidney tubular injury							
92b	Rich, MW et al	Incidence, risk factors, and clinical course	Archives of Internal Medicine	1990	227	8.73	283	10.88	2353856
		of acute renal insufficiency after cardiac							
		catheterization in patients 70 years of age							
		or older. A prospective study		1050			<i></i>	<i>с</i> 1	
92c	Stein, JH et al	Current concepts on the pathophysiology	American Journal of Physiology	1978	227	5.97	64	6.4	343602
	າແຜ່ ເອເມີດເດເມດອາ	is bne ,eninist IA ,en <u>ioimateb</u> tenietxebentes;	dem iapen Amaic amfaite Aabout Lavideli	nes.xhtml					
	solvelendent velin	ic has paining it build of the has the prototolog of		4					

5 6

		of acute renal failure							
93a	Bates, DW et al	Mortality and costs of acute renal failure associated with amphotericin B therapy	Clinical Infectious Diseases	2001	226	15.07	285	8.64	112298
93b	Richards, WO et al	Acute renal failure associated with increased intra-abdominal pressure	Annals of Surgery	1983	226	6.85	213	14.2	660060
94a	Supavekin, S et al	Differential gene expression following early renal ischemia/reperfusion	Kidney International	2003	225	17.31	242	17.29	1267584
94b	Diaz-Sandoval, LJ et al	Acetylcysteinetopreventangiography-related renal tissue injury (theAPART Trial)	American Journal of Cardiology	2002	225	16.07	296	22.77	1180944
95	Bruno, Stefania et al	MesenchymalStemCell-DerivedMicrovesiclesProtectAgainstAcuteTubular Injury	Journal of the American Society of Nephrology	2009	224	32.00	230	32.86	193898
96	Liangos, Orfeas et al	UrinaryN-acetyl-beta-(D)-glucosaminidaseactivityandkidneyinjury molecule-1level are associated withadverse outcomes in acute renal failure	Journal of the American Society of Nephrology	2007	222	24.67	260	28.89	172677
lqsıgoildi	on June 9, 2025 at Agence B milar technologies.	ly 2016. Downloaded from http://bmjopen.bmj. seignement Superieur (ABES) is bns ,gninist IA ,gnining,blangarphyster seighted kodenseighene seighted kodenseighte seighted kodenseighte seighted kodenseighte s	J 25 no 063110-3102-nəqoimd\3611.01 ដ E ស្វាយចោងលើងអាវារិកចំពាន់ខ្មារផ្តែទារសង្ការទាំងទាំងទាំងទាំងទាំងទាំងទាំងទាំងទាំងទាំង	nes.xhtm	uq tərit :nəqO I	сма			

97	Kuitunen, A et al	Acute renal failure after cardiac surgery:	Annals of Thoracic Surgery	2006	221	22.10	255	25.5	16427848
		Evaluation of the RIFLE classification							
98	Morcos, SK et al	Contrast-media-induced nephrotoxicity: a	European Radiology	1999	220	12.94	290	17.06	10525875
		consensus report							
99	Ward, MM et al	Factors predictive of acute renal failure in	Archives of Internal Medicine	1988	218	7.79	242	8.64	3382301
100	Heyman, SN et al	rhabdomyolysis Acute renal failure with selective	Journal of Clinical Investigation	1988	215	7.68	156	5.57	3403711
	- j j		_						
			A View o						
i on onhuidh 6	BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) Iuty verted for for to destand dated for for to destand dated for to destand dated for the solution of the solut								
blioaraphiaue de l	on June 9. 2025 at Agence Bi	Vmos.imd.nagoimd//:atth most babsolnwod. 3102 yl	uL 72 no 0E8110-8102-n9aoimd\8E11.01 a	se bədzildı	Open: first pi	rm8			

BMJ Open

The 100 Top-cited Articles Focusing on Acute Kidney Injury: a bibliometric analysis

	BMJ Open
Manuscript ID	bmjopen-2016-011630.R1
Article Type:	Research
Date Submitted by the Author:	n/a
Complete List of Authors:	Liu, Yuan-hui; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Wang, Sheng-qi; Department of Pharmacy, Nanfang Hospital, Southern Medical University, Guangzhou, 510515, China, Xue, Jin-hua; Department of Physiology, School of Basic Medical Sciences, Gannan Medical University, Ganzhou, 341000, China, Liu, Yong; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Chen, Ji-yan; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Li, Guo-feng; Department of Pharmacy, Nanfang Hospital, Southern Medical University, Guangzhou, 510515, China, He, Peng-cheng; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Tinstitute, Guangdong General Hospital, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China, Tan, Ning; Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, China,
Primary Subject Heading :	Renal medicine
Secondary Subject Heading:	Renal medicine
Keywords:	Bibliometric analysis, Acute kidney injury, Top 100 cited articles



BMJ Open

The 100 Top-cited Articles Focusing on Acute Kidney Injury: a bibliometric analysis

Yuan-hui Liu MD^{1#}, Sheng-qi Wang MD^{2#}, Jin-hua Xue MD^{3, 4#}, Yong Liu MD¹, Ji-yan Chen MD, FACC, FESC¹, Guo-feng Li MD², Peng-cheng He MD^{1*}, Ning Tan MD, FACC, FESC, FAPSIC^{1*}

[#]Equal contributors

*Corresponding author

¹Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong Provincial Key Laboratory of Coronary Heart Disease Prevention, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, Guangdong, China

²Department of Pharmacy, Nanfang Hospital, Southern Medical University, Guangzhou, 510515, China

³Department of Pathophysiology, School of Basic Medical Sciences, Southern Medical University, Guangzhou, 510515, China

⁴Department of Physiology, School of Basic Medical Sciences, Gannan Medical University, Ganzhou, 341000, China

Correspondence: Ning Tan MD, FACC, FESC, FAPSIC; Peng-cheng He MD. Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong Provincial Key Laboratory of Coronary Heart Disease Prevention, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, Guangdong, China E-mail: gdtanning@126.com; Telephone: +86-20-83819161; Fax: +86-20-83824369;

Abstract

Background: Acute kidney injury (AKI) is a major global health issue, associated with poor shortand long-term outcomes. Research on AKI is increasing with numerous articles published. However, the quantity and quality of research production in the field of AKI is unclear.

Methods and analysis: To analyze the characteristics of the most cited articles on AKI and to provide information about achievements and developments in AKI, we searched the Science Citation Index Expanded for citations of AKI articles. For the top 100 most frequently cited articles (T100), we evaluated the number of citations, publication time, province of origin, journal, impact factor, topic or subspecialty of the research, and publication type.

Results: The T100 articles ranged from a maximum of 1971 citations to a minimum of 215 citations (median 302 citations). T100 articles were published from 1951 to 2011, with most articles published in the 2000s (n=77), especially the 5-year period from 2002 to 2006 (n=51). The publications appeared in 30 journals, predominantly in the general medical journals, led by New England Journal of Medicine (n=17), followed by expert medical journals, led by the Journal of the American Society of Nephrology (n=16) and Kidney International (n=16). The great majority (83.7%) of T100 articles were published by teams involving \geq 3 authors. T100 articles originated from 15 countries, led by the USA (n = 81) followed by Italy (n = 9). Among the T100 articles, 69 were clinical research, 25 were basic science, 21 were reviews, 5 were meta-analyses and 3 were clinical guidelines. Most clinical articles (55%) included patients with any cause of AKI, followed by the specific causes of contrast-induced AKI (25%) and cardiac surgery-induced AKI (15%).

Conclusions: This study provides a historical perspective on the scientific progress on AKI, and highlights areas of research requiring further investigations and developments.

Key words: Citation analysis; Acute kidney injury; Top 100 cited articles.

Strengths and limitations of this study

Two meticulous searches were performed in the Web of Science and consistent results were demonstrated in Scopus data.

Since some articles were cited more frequently than others because of the differences in time since publication, and this error was adjusted by a citation index determined for each article.

The language of publication was restricted to English, which would have failed to capture landmark articles published in other languages.

Findings of the present study would provide a historical perspective on the scientific progress on acute kidney injury.

Findings of the present study would highlights areas of research requiring further investigations and developments.

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES)

Enseignement superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

Introduction

Acute kidney injury (AKI) is a major global health issue and its incidence is markedly increasing in both developed and developing nations.¹ The reported incidence ranges from 5% to 30-50% in patients under various conditions, such as coronary intervention,² cardiac surgery,³ and intensive care unit admission.⁴ The development of AKI not only increases hospital stay and health care costs, but also results in poor short- and long-term outcomes.⁴ Considering the importance of AKI, researches in this field has been increasing, and numerous articles have been published annually, giving new insights into the mechanism, early recognition, prevention or treatment of AKI.⁵⁶ However, little is known regarding the quality of scientific achievements in this area.

Citation analysis is a bibliometric process that determines the influence of an article in the scientific community and evaluates the impact factor (IF) of a journal.⁷ The number of citations received by an article is a measure of its recognition and influence within the scientific community. A paper with greater citation history may be more valuable in its field.^{8 9} Furthermore, citation analysis of the scientific literature may help to identify articles, research topics, and authors of influence.¹⁰ Therefore, academic institutions, funding agencies, and the public become increasingly interested in using citation analysis to assess the research quality and productivity of individual researchers.¹¹ Numerous attempts have been made to identify the most cited articles in various medical disciplines, including psychology,¹² radiology,¹³ hypospadiology,¹⁴ hypertension,¹⁵ surgery¹⁶ and cardiac surgery.¹⁷ However, no citation analysis of AKI has been published to date. Therefore, we aimed to analyze the characteristics of the 100 top-cited articles focused on AKI, and to determine achievements and advances in this field during the past century.

Methods

Search strategy

We conducted a citation search of the Science Citation Index Expanded database of the Thomson Reuters Web of Science Core Collection (Philadelphia, PA, USA) from 1945 to 15 July 2015. The following search key words were used: "acute kidney injury" or "AKI" or "acute renal failure" or "ARF". All electronic searches were conducted on one day, 15 July 2015, to avoid changes in citation rate as much as possible. After all identified articles were retrieved, and the results were sorted using the option "Times cited", which yielded a list of all the articles published in a specific journal ranked by citation number. The papers that had a higher citation density were ranked higher.

Study selection

BMJ Open

Articles on the list were then reviewed by two independent reviewers (Y.H.L and S.Q.W) by reading the abstracts acquired from Web of Science. When it is necessary, the full-texts were acquired from PubMed, Embase or ScienceDirect. Only studies focusing on AKI as the main topic and in the English language were included. The exclusion criteria were: (1) articles in languages other than English, (2) articles focused on other topics other than about AKI. Any disagreement between the two reviewers was resolved through discussion with a third reviewer (J.H.X).

Assessing the articles and Journals

Using the modified approach of the methods by Lim and Azer et al,¹⁸¹⁹ two reviewers (Y.H.L and S.Q.W) reviewed the top 100 cited (T100) articles and the following data were compiled: (1) citation number, (2) number of authors and authorship (first, second and corresponding authors), (3) title, (4) publication year, (5) country of origin. If there were authors from multiple countries, country of origin was determined using the country that the corresponding author belonged to. Those from the same country were classified into those from one institute and those from more than one institute. Articles that received funding source were identified. Level of evidence for clinical studies was also identified, and was evaluated based on the levels of evidence introductory document from the Oxford Centre for Evidence-based Medicine.²⁰ In addition, journal name and IF were also extracted. The journals IFs were cross-referenced with the 2014 edition of Journal Citation Reports (JCR): Science Edition (1945-2014).

Evaluating the included studies

Based on included study design, research setting and goals, the selected articles were grouped into 5 categories: clinical guidelines, review, meta-analysis, basic research, and clinical research (including observational and randomized control trials, RCTs). Prospective, retrospective, and case series were all categorized as observational studies. RCTs include both single- and double-blind studies.

In addition, according to the causes of AKI, the topics were divided into (1) any cause, (2) contrast, (3) cardiac surgery, and (4) others. Since some articles were cited more frequently than others because of the difference in time since publication, this error was adjusted by a citation index determined for each article. The citation index was defined as the mean number of citations per year. For comparison, we searched Scopus (http://www.scopus.com/ search/form.url; retrieved on July 15th, 2015) for total citation counts of the T100 articles.

Statistical analysis

Data are represented as median or interquartile range. The differences between groups were evaluated by the Wilcoxon rank sum test. The Spearman test was used to evaluate the strength and direction of the linear relationship between journal IF and the number of T100 cited articles or citations, and the correlation of article citations between different databases (Web of Science Core Collection and Scopus). All data analyses were performed with SPSS 17 software (SPSS Inc., Chicago, IL, USA). All probability values were two-tailed, and the threshold for significance was set at P < 0.05.

Results

Citation count and publication year

A total of 56,830 papers were identified after the initial search in the period from 1945 to present. Among them, articles that focused solely on AKI and were among the top 100 most cited were included. Flow diagram representing the study selection process was presented in Supplementary Figure 1. Ultimately, 123 articles (including some duplicate citations) were included in the analysis (**Table1 and Supplementary Table 1**). The median number of citations was 302 (range 215 to 1,971), with only three papers cited over 1000 times. The citation index (median 216, range 5 to 184) was correlated with number of the citations (r=0.581, P<0.001) per article. In addition, the number of citation and citations index per article were positively correlated between the Web of Science and Scopus database (r=0.770, P < 0.001; r=0.791, P < 0.001, respectively).

The selected T100 articles were published from 1951 to 2011, with most articles published in the 2000s (n=77), and particularly the 5-year period from 2002 to 2006 (n=51), followed by the 1990s (n=22) (Figure 1). The single years with the most cited articles were 2004 and 2006 (each n=13). The number of citations was also the highest in the 2000s (30, 537) followed by the 1990s (9510). Spearman test indicated an uptrend between the citation index and time (r=0.315, P < 0.001). There is no correlation between time and number of citations(r=-0.003, P=0.975), but a positive correlation between time and citation index(r=0.347, P < 0.001).

Publishing journals of T100 articles

The T100 articles were published in 30 journals (**Table 2**), predominantly in general medical journals, led by the New England Journal of Medicine (n=17), followed by expert medical journals, led by the Journal of the American Society of Nephrology (n=16) and Kidney International (n=16) (Table 2). In addition, Journal of Clinical Investigation, Lancet, Journal of the American Medical Association, American Journal of Medicine, and Critical Care Medicine contributed 11, 7, 5, 5, and 5

BMJ Open

Authorship, Origins, and Institutions

The great majority (83.7%) of T100 articles were produced by teams involving \geq 3 authors. A list of the most frequently-appearing authors is presented in **Table 3.** It is clearly dominated by JV Bonventre, who authored 10 T100 articles (first author: 5; corresponding author: 9) with a total of 4,527 citations, and P Devarajan, who authored 8 T100 articles with 3428 citations.

The T100 articles originated from 15 countries, led by the USA (n = 81) followed by Italy (n = 9), Germany (n=7), France (n=5), and the United Kingdom (n=5), with all other counties having less than five publications, as shown in **Figure 2**. Articles originating from the USA also had the highest mean number of citations (mean 384 citations per article). Of the T100 articles, the leading institutions with the most productive articles were Brigham and Women's Hospital (Boston, USA), Cincinnati Children's Hospital Medical Center (Cincinnati, USA) and the University of California, San Francisco (San Francisco, USA), with five articles each. The two institutions ranking next is the Yale University (West Haven, USA) (**Table 4**).

Publication type and areas of study

The T100 articles included 69 clinical studies, 25 basic science studies, 21 reviews, 5 meta analyses and 3 clinical guidelines (Figure 3). The number of total citations per article ranged from 218 to 1652 (median, 303) for clinical studies, and from 215 to 814 (median, 257) for basic science. Of the 69 clinical articles, the most common type was prospective observational studies (n=35), followed by RCTs (n=16), retrospective studies (n=16), and case reports (n=2). In addition, 75% of 16 RCTs were published in the journals with high IF, 8 in New England Journal of Medicine, 2 in Lancet and 2 in JAMA. Only 18% of 51 observational studies were published in the journals with high IF, and most of them (47%) presented open access options, and all of them came from prospective observational studies, including 4 in New England Journal of Medicine, 2 in Lancet and 3 in JAMA. Furthermore, prospective observational studies had the higher median citation of per article than the retrospective studies (median: 298 vs. 292)

The primary purpose of these clinical studies included evaluation of a therapy strategy (n=16), description of biomarkers or risk model to prevent AKI (n=9, and n=3, respectively), description of

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

epidemiology (n=27), evaluation of a diagnostic modality (n=5), and others (n=9). With regard to the causes of AKI in clinical researches, most articles (55%) included patients with any cause of AKI, followed by specific contrast induced AKI (25%) and cardiac surgery induced AKI (15%). Only 1 study reported on drug induced AKI, and the rest were nontraumatic rhabdomyolysis induced AKI (n=3). In addition, ischemic induced AKI was the most common type of AKI (64%) assessed in basic science studies, followed by drug induced AKI models (32%) and only 1 basic research study concerned surgery induced AKI.

Funding source and level of evidence

Among T100 articles (original articles), 60 were funded by public foundations, 3 received support from commercial companies, 8 were supported by both, and the remaining 52 did not specify the funding source (**Figure 4**). More than half of studies that disclosed funding (95.8%) were supported by the public, and pharmaceutical companies only supported 15.5%. Funding supported most of the basic science T100 studies (96%, 24/25), but only 43.5% of clinical articles.

All of the clinical articles were assigned a level of evidence from 1 to 5 (**Figure 5**). Level 2b (47.3%) was the most frequent level of evidence, with a median of 298 citations per article. There were 16 studies each at level 1b and 3b. Only 1 and 4 T100 cited articles were assigned to level 1a and 2a, respectively. There was no significant association between citation index and level of evidence (P = 0.847). In addition, the evidence level was not strongly correlated with overall number of citations (r=-0.11, p=0.345), citation index (r=-0.08, p=0.500), or year of publication (r=-0.16, p=0.174).

Discussion

The present study is the first to identify, rank and characterize the T100 articles in the field of AKI. The results reveal important advances and prevalent areas of interest in research about AKI, and may help physicians and scientists understand and design future research. The present study also provides quantitative information about authors, institutions, and journals that helps to identify classic works and high-impact journals.

Bibliometric analysis is a tool that quantifies the characteristics and scholarly impact of citation classics. Citation analysis, one common bibliometric method, can help authors to recognize important advances, and add a useful perspective on historical developments in a specific field. Understanding the characteristics inherent to highly cited works could help researchers who wish to publish effectively.²¹ However, we also should notice that the citations number might be poorly

BMJ Open

related to merit, it is strongly affected by the journal in which the paper is published.^{8 22} In addition, the number of citations would be influenced by factors such as the geographic origin of the authors, whether they are English speaking,²³ and the gender of the authors.²⁴ Despite some disadvantages in the assessment of article quality based simply on citation rating, it remains the most widely-accepted method currently available to judge the merits of a paper or journal.²⁵ Citation analysis is often used by journals to attract manuscripts with high citation potential. Currently, citation analysis of top cited articles is widespread and reported in various medical disciplines. However, there has been no citation analysis of AKI, which is a major global health issue associated with increased medical cost, and poor short- and long- term outcomes. In addition, the prevention, diagnosis, and treatment of AKI have become a rapidly developing specialty in recent years. This development is evidenced by the increasing number of related studies in the scientific literature. Identifying the classic articles that have contributed to progress in AKI research will help to understand the history and development of AKI and design future studies. However, little work has been conducted to recognize these important papers. The present study is the first to analyze the top article citations in AKI, and will help readers or authors to recognize the quality of the research, discoveries, and the trends steering AKI.

An article has more time to be cited with increasing age, and "older" articles are more likely to attain more citations, purely because of their longer citable period. However, in this analysis, most of the T100 articles (67%) were published between 2001 and 2009. This result is not consistent with most other citation analyses, in which the peak period for citation is from 1980 to 1995. However, it is consistent with recent research in the field of cardiovascular diseases.²⁶ In addition, to overcome the effect of publication time on citations, we also assessed the citation index as a measure of the true impact of an article independent of short-lived trends. The results remained consistent indicating that the number of AKI articles increased, and this field attracted more resources and materials in the past 10 years, with the growing incidence of AKI, because of increasing exposure to contrast media or cardiothoracic surgery.

Some previous studies have demonstrated that high IF journals are attractive to authors, which in turn preferentially attract more submissions from the authors. Therefore, the IF of a journal is the strongest indicator for citations, and most top cited articles are published in high IF journals.²⁷⁻²⁹ The present study also demonstrated that IF was positively correlated with the number of T100 articles, and the number of citations. However, other than the high-IF general medical journal the-New

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de I Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

England Journal of Medicine, which published 17 T100 articles, the most productive journals were the Journal of the American Society of Nephrology and Kidney International, which have relatively low IFs. This result indicates an increasing trend of publishing highly influential articles in specialty journals dedicated solely to research into renal diseases such as AKI rather than general medical journals (e.g. Lancet or JAMA). These results are consistent agree with previous studies focusing on other diseases^{15 26}. Our results also revealed that no T100 basic research study focusing on AKI was published in Nature, Cell, or Science, the highest influent journals on basic research. This result is in contrast to hypertension studies, among which highly cited basic research was published more frequently in Nature (6 articles) and Cell (4 articles).¹⁵

Fifteen countries contributed to the T100 cited articles, led by the USA, which is similar to the T100 articles in the fields of cardiac surgery,¹⁷ sepsis,³⁰ and others.^{26 31 32} This finding confirms the influence of the USA in relation to AKI research worldwide and may be related to the large population and abundant financial resources available to the scientific community in the USA. In addition, among the top 13 institutions, 9 (69%) are in USA. The leading institution is Brigham and Women's Hospital, which published 9 T100 cited articles with total citations number of 4263. Furthermore, American authors tend to cite local papers and European authors tend to publish in American journals and USA reviewers prefer USA papers.^{29 33} In addition, European countries, like Italy and the UK, also demonstrated higher productivity. However, despite the rapid development of scientific research in recent years, Asian authors have not played a dominant role in AKI research since their contribution to research productivity is relatively low. This finding seems to conform to the phenomenon that "a country with better economic ranking has the higher quantity and quality of biomedical publications".³⁴ A number of first or corresponding authors were represented more than once on the list. This list of frequently-cited authors highlights some of the world's best-recognized experts in the field of AKI research. The most frequently-cited authors JV Bonventre and P Devarajan, with 5 and 6 articles, respectively, were associated with clinical articles.

Financial support from public foundations or commercial companies has greatly contributed to medical and public health research. In our study, more than half (57.7%) of T100 articles reported a source of funding support. Among them, 84.5% received funding from public institutions or national foundations, 4.2% from industry and 11.3% from both. Although, industry-funded research has been widely debated because of susceptibility to various biases, it has played and will continue to play a critical role in the research process.³⁵ In another recent study, 24% of funding was from

BMJ Open

industry, which is higher than in the present study. However, 30% of reported funding was from public agencies, which is lower than ours.³⁰ This comparison indicates that government-funded entities have prioritized AKI, a global health issue impacting medical costs. The cost per 6-month AKI survivor was calculated to be \$80 000.³⁶ Another reason for this discrepancy might be the lack of new drug development research in the present T100 articles, resulting in little funding from pharmaceutical companies. In addition, only 44% of clinical research received funding, while 96% of basic research received funding. These results confirm the key role of public funding in the generation of influential basic research. However, clinical research has bridged the gap between basic science and human health improvement, is heavily weighted towards biomedical science, and plays a special role in the fight against AKI by providing evidence for its treatment and diagnosis. High-quality clinical research is expensive, and in the future, it should receive more funding support.

Based on the advantages of clinical research mentioned above, more clinical studies have been performed to provide new insights into the prevention, biomarkers, diagnosis or treatment of AKI. In addition, a recent detailed bibliometric analysis suggests the rapid dissemination of clinical findings.³⁷ Thus, it is not surprising that most of the T100 articles (58%) in the present study are clinical research, consistent with analyses in other fields.³⁸⁻⁴⁰ The mean citation number per clinical research article was higher than that of basic research articles (404 vs. 328). Among clinical studies, the most frequent type was prospective observational study (n=35), followed by RCT (n=16). Our limited survey, based on the analysis to identify the citation source for the top 3 T100 clinical studies, revealed that most of their citations (2/3) came from other original articles (both clinical and pre-clinical studies), with the rest of citations (1/3) in subsequent reviews, editorials, or meta-analyses. This distribution suggests that the conclusions of these highly cited clinical studies have stimulated much subsequent original research. Guidelines, reviews and meta-analyses (with 852, 362, and 267 mean citations per article, respectively) accounted for a high proportion (22%) of the list, which is a common finding in top citation assessments for any medical specialty. Authors frequently cite such publications as they convey outcome generalities of many single site studies. It is well recognized that levels of evidence will vary depending on the study designs. The goal of rating study designs and levels of evidence is to indicate the best available evidence for use in patient care. Among various study designs, RCTs provide the highest quality evidence for most

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

clinical or interventional trials. The T100 articles included 16 RCTs, a lower proportion than other top medical articles, such as hypertension (24 RCTs).

A large majority of clinical research studies in the T100 cited articles included patients with AKI from any cause admitted to an intensive care unit. Among the research on specific causes of AKI, contrast-induced AKI in patients after cardiac catherization was the most common. It is not surprising that researchers have been increasingly interested in the field of biomarkers,⁴¹ or therapy for contrast induced AKI,⁴² with a large number of papers published, in parallel with the increasing use of cardiac catherization. Additionally, previous studies demonstrated that contrast-induced AKI is a common complication after procedures requiring contrast media, responsible for 11% of in-hospital AKI cases, and also associated with poor short- and long-term outcomes.²⁴³ In our T100 RCT studies, 50% focused on the therapy of contrast-induced AKI. However, more high-quality RCTs for other causes of AKI, such as cardiac surgery, are needed in the future.

This study also has some limitations. First, despite a meticulous search of Web of Science and consistent results also demonstrated in Scopus data, some studies might have been missed. Second, this type of study usually favors older published articles, but excludes some recently published high quality studies, a limitation related to the effect of time on citations. Third, using the number of citations alone can not quantify the value of contributions to the field. Therefore, papers that are important and influential, but have a lower citation frequency, might be missed. Fourth, the minimal effect of self-citation was also not considered in our study. Finally, the language of publication was restricted to English, which would have failed to capture landmark articles published in other languages.

Conclusions

Our analysis summarized of the most influential studies on AKI, and highlights research areas that require further investigation and development. Our analysis also provides an insight into the citation frequencies of the top cited articles on AKI and sheds light on the quality of the works, discoveries, and trends steering AKI research globally.

Contributors

Conception/Design: NT, YHL, PCH.

Collection and/or assembly of data: YHL, SQW, JHX, YL, JYC, PCH.

Data analysis and interpretation: YHL, SQW, JHX, YL, JYC.

Manuscript writing: YHL.

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

BMJ Open

Manuscript revising: NT, YHL, SQW, GFL.

Final approval of the version to be published: All authors.

Funding

This study was supported by a grant from the National Natural Science Foundation of China (Grant no. 81270286). The funders had no role in the study design, data collection and analysis, decision to publish, or preparation of the manuscript. This work was not funded by any industry sponsors.

Competing interests

The authors declare that they have no competing interests.

Ethical approval

Not required.

Data sharing

No additional data available.

References

- 1. Ad-hoc working group of E, Fliser D, Laville M, *et al*. A European Renal Best Practice (ERBP) position statement on the Kidney Disease Improving Global Outcomes (KDIGO) clinical practice guidelines on acute kidney injury: part 1: definitions, conservative management and contrast-induced nephropathy. *Nephrol Dial Transplant* 2012;27: 4263-72.
- Giacoppo D, Madhavan MV, Baber U, *et al.* Impact of Contrast-Induced Acute Kidney Injury After Percutaneous Coronary Intervention on Short- and Long-Term Outcomes: Pooled Analysis From the HORIZONS-AMI and ACUITY Trials. *Circ Cardiovasc Interv* 2015; 8:e002475.
- 3. Huber M, Ozrazgat-Baslanti T, Thottakkara P, *et al.* Mortality and Cost of Acute and Chronic Kidney Disease after Vascular Surgery. *Ann Vasc Surg* 2016;30:72-81.
- 4. Hoste EA, Bagshaw SM, Bellomo R, *et al*. Epidemiology of acute kidney injury in critically ill patients: the multinational AKI-EPI study. *Intensive Care Med* 2015;41:1411-23.
- 5. Yang Y, Song M, Liu Y, *et al.* Renoprotective approaches and strategies in acute kidney injury. *Pharmacol Ther* 2016. . doi: 10.1016/j.pharmthera.2016.03.015. [Epub ahead of print]
- 6. Dellepiane S, Marengo M, Cantaluppi V. Detrimental cross-talk between sepsis and acute kidney injury: new pathogenic mechanisms, early biomarkers and targeted therapies. *Crit Care* 2016;20:61.
- 7. Moed HF. New developments in the use of citation analysis in research evaluation. *Arch Immunol Ther Exp* 2009;57:13-8.
- 8. Eyre-Walker A, Stoletzki N. The assessment of science: the relative merits of post-publication review, the impact factor, and the number of citations. *PLoS Biol* 2013; 11:e1001675.
- 9. Moed HF. The impact-factors debate: the ISI's uses and limits. *Nature* 2002;415:731-2.
- 10. Smith DR, Rivett DA. Bibliometrics, impact factors and manual therapy: balancing the science and the art. *Man Ther* 2009;14:456-9.
- 11. Moed HF. New developments in the use of citation analysis in research evaluation. Arch Immunol Ther Exp (Warsz).2009;57:13-18.
- 12. Ho YS, Hartley J. Classic articles in Psychology in the Science Citation Index Expanded: A bibliometric analysis. *Br J Psychol* 2015. doi: 10.1111/bjop.12163.[Epub ahead of print]
- 13. Pagni M, Khan NR, Cohen HL, *et al*. Highly cited works in radiology: the top 100 cited articles in radiologic journals. *Acad Radiol* 2014;21:1056-66.
- 14. O'Kelly F, Nason GJ, McLoughlin LC, *et al*. A comparative bibliometric analysis of the top 150 cited papers in hypospadiology (1945-2013). *J Pediatr Urol* 2015;11:85 e1-85.
- 15. Oh YS, Galis ZS. Anatomy of success: the top 100 cited scientific reports focused on hypertension research. Hypertension 2014;63:641-7.
- 16. Long X, Huang JZ, Ho YS. A historical review of classic articles in surgery field. *Am J Surg* 2014;208:841-9.
- 17. O'Sullivan KE, Kelly JC, Hurley JP. The 100 most cited publications in cardiac surgery: a bibliometric analysis. *Ir J Med Sci* 2015;184:91-9.
- 18. Lim KJ, Yoon DY, Yun EJ, *et al.* Characteristics and trends of radiology research: a survey of original articles published in AJR and Radiology between 2001 and 2010. Radiology 2012;264:796-802.
- 19. Azer SA, Azer S. Bibliometric analysis of the top-cited gastroenterology and hepatology

2 3

4

5

6 7

8

9

10

BMJ Open

articles. BMJ Open 2016;6:e009889. e5910. 396:210. 25. Adam D. The counting house. Nature 2002;415:726-9. *Chirurg* 2010;81:328-33. *Med Libr Assoc* 1990;78:376-82. analysis. Crit Care 2012;16:R110. Assoc J 2013;7:e16-24. 1988-1990]. Ugeskr Laeger 1998;160:4644-8. 2000;26:1824-31. trials results. Res Eval 2013;22:179-86. literature. Musculoskelet Surg 2015;99:105-11. Atherosclerosis 2014;237:453-9.

42. Bei WJ, Duan CY, Chen JY, et al. Remote Ischemic Conditioning for Preventing Contrast-Induced Acute Kidney Injury in Patients Undergoing Percutaneous Coronary

- 20. Phillips B, Ball C, Sackett D, *et al.* Levels of evidence. Available from URL: http://www.cebm. net/index.aspx?o=1025 Accessed on 1 October 2013.
- 21. Allen L, Jones C, Dolby K, et al. Looking for landmarks: the role of expert review and bibliometric analysis in evaluating scientific publication outputs. PLoS One 2009;4:
- 22. Lariviere V, Gingras Y. The Impact Factor's Matthew Effect: A Natural Experiment in Bibliometrics. J Am Soc Inf Sci Tec 2010;61:424-27.
- 23. Paris G, De Leo G, Menozzi P, et al. Region-based citation bias in science. Nature 1998;
- 24. Stephane B. Normative versus social constructivist processes in the allocation of citations: anetwork-analytic model. Am Sociol Rev 1998;63:829-46.
- 26. Shuaib W, Khan MS, Shahid H, et al. Bibliometric analysis of the top 100 cited cardiovascular articles. Am J Cardiol 2015;115:972-81.
- 27. Garfield E. The history and meaning of the journal impact factor. JAMA 2006;295:90-3.
- 28. Fendrich V, Rothmund M. Surgical research in Germany--an international comparison.
- 29. Campbell FM. National bias: a comparison of citation practices by health professionals. Bull
- 30. Tao T, Zhao X, Lou J, et al. The top cited clinical research articles on sepsis: a bibliometric
- 31. Nason GJ, Tareen F, Mortell A. The top 100 cited articles in urology: An update. Can Urol
- 32. Gu W, Yuan Y, Yang H, et al. A bibliometric analysis of the 100 most influential papers on COPD. Int J Chron Obstruct Pulmon Dis 2015;10:667-76.
- 33. Link AM. US and non-US submissions: an analysis of reviewer bias. JAMA 1998;280:246-7.
- 34. Nielsen FE. [Publication outcome of research funding by the Danish Heart Foundation
- 35. Rowe S, Alexander N, Clydesdale FM, et al. Funding food science and nutrition research: financial conflicts and scientific integrity. *Am J Clin Nutr* 2009;89:1285-91.
- 36. Korkeila M, Ruokonen E, Takala J. Costs of care, long-term prognosis and quality of life in patients requiring renal replacement therapy during intensive care. Intensive Care Med
- 37. Rosas SR, Schouten JT, Cope MT, et al. Modeling the dissemination and uptake of clinical
- 38. Piolanti N, Nesti A, Andreani L, et al. The fifty most cited Italian articles in the orthopaedic
- 39. Aminian A, Daigle CR, Brethauer SA, *et al.* Citation classics: top 50 cited articles in bariatric and metabolic surgery. Surg Obes Relat Dis 2014;10:898-905.
- 40. Cao F, Li J, Li A, et al. Citation classics in acute pancreatitis. Pancreatology 2012;12:325-30.
- 41. Liu YH, Liu Y, Chen JY, et al. LDL cholesterol as a novel risk factor for contrast-induced acute kidney injury in patients undergoing percutaneous coronary intervention.

54

55

56 57

58

Interventions/Coronary Angiography: A Meta-Analysis of Randomized Controlled Trials. J Cardiovasc Pharmacol Ther 2016;21:53-63.

43. Nash K, Hafeez A, Hou S. Hospital-acquired renal insufficiency. Am J Kidney Dis 2002;



Table and Figure legends

1

2
З
3
4
5
6
7
1
8
9
40
10
11
12
40
13
14
15
10
10
17
18
$2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1$
19
20
21
22
23
24
25
25
26
27
21
28
29
30
00
31
32
33
00
34
35
36
50
37
38
30
10
10
41
42
72
43
44
45
46
47
48
40
49
50
51
51
52
53
54
55
56
57
58
59
60
F 31 1

Table 1. Bibliometric information associated with the Top 20 of the Top 100 cited articles on acute
kidney injury.
Table 2. Journals in which the T100 articles were published.
Table 3. Authors with two or more top-cited articles.
Table 4. Institutions with two or more top cited articles on acute kidney injury.
Figure 1. Numbers of articles published and number of citations in 5 years periods.
Figure 2. Countries of origin of the top100 cited articles on acute kidney injury.
Figure 3. Distributions of research type of the top 100 cited articles on acute kidney injury.
Figure 4. Funding source of the top 100 cited research studies.
Figure 5. Levels of evidence of the top 100 cited clinical articles.
Supplementary Figure 1: Flow diagram representing the study selection process

Rank	Authors	Title	Journals	Years	Times Cited (Web)	Citation Index (Web)	Times Cited (Scopus)	Citation Index (Scopus)	PMID
1	Bellomo, R et al	Acute renal failure-definition, outcome measures, animal models, fluid therapy and information technology needs: the Second International Consensus Conference of the Acute Dialysis Quality Initiative (ADQI) Group	Critical Care	2004	1971	164.25	2219	184.92	15312219
2	Mehta, RL et al	Acute Kidney Injury Network: report of an initiative to improve outcomes in acute kidney injury	Critical Care	2007	1652	183.56	1725	191.67	17331245
3	Uchino, S et al	Acute renal failure in critically ill patients-A multinational, multicenter study	JAMA-Journal of the American Medical Association	2005	1297	117.91	1489	135.36	16106006
4	Thadhani, R et al	Medical progress - Acute renal failure	New England Journal of Medicine	1996	963	48.15	1139	56.95	8618585
5	Mishra, J et al	Neutrophil gelatinase-associated lipocalin (NGAL) as a biomarker for acute renal injury	Lancet	2005	949	86.27	1079	98.09	15811456

10

Chertow, GM et al								
	Acute kidney injury, mortality, length of stay, and costs in hospitalized patients	Journal of the American Society of Nephrology	2005	893	81.18	1035	94.09	16177006
Ronco, C et al	Effects of different doses in continuous veno-venous haemofiltration on outcomes of acute renal failure: a prospective randomised trial	Lancet	2000	816	51.00	1032	64.5	10892761
Paller, MS et al	Oxygen free radicals in ischemic acute renal failure in the rat	Journal of Clinical Investigation	1984	814	25.44	575	17.97	6434591
McCullough, PA et al	Acute renal failure after coronary intervention: Incidence, risk factors, and relationship to mortality	American Journal of Medicine	1997	799	42.05	1016	53.47	9375704
Levy, EM et al	The effect of acute renal failure on mortality - A cohort analysis	JAMA- Journal of the American Medical Association	1996	793	39.65	998	49.9	8622223
Rihal, CS et al	Incidence and prognostic importance of acute renal failure after percutaneous coronary intervention	Circulation	2002	691	49.36	877	62.64	12010907
Solomon, R et al	Effects of saline, mannitol, and furosemide to	New England Journal of pu/lappipnenxarai pape/aits/	1994 ໂຄດອງ ໂຣນເງິດໂດ	684 ទំពេ ទសុគ ្រវ	31.09	902	41.14	7969280
	Paller, MS et al McCullough, PA et al Levy, EM et al Rihal, CS et al Solomon, R et al	veno-venous haemofiltration on outcomes of acute renal failure: a prospective randomised trialPaller, MS et alOxygen free radicals in ischemic acute renal failure in the ratMcCullough, PA etAcute renal failure after coronary intervention: Incidence, risk factors, and relationship to mortalityLevy, EM et alThe effect of acute renal failure on mortality - A cohort analysisRihal, CS et alIncidence and prognostic importance of acute renal failure after percutaneous coronary interventionSolomon, R et alEffects of saline, mannitol, and furosemide to	veno-venous haemofiltration on outcomes of acute renal failure: a prospective randomised trial Second	veno-venous haemofilitation on outcomes of acute renal failure: a prospective randomised trial acute renal failure: a prospective randomised trial Paller, MS et al Acute renal failure in the rat Journal of Clinical 1984 McCullough, PA et Acute renal failure after coronary intervention: mortality American Journal of Medicine 1997 In effect of acute renal failure on mortality - mortality JAMA- Journal of the Acotor tanalysis 1996 Rihal, CS et al Incidence and prognostic importance of acute renal failure after percutaneous coronary intervention Circulation 2002 Solomon, R et al Effects of saline, mannitol, and furosemide to New England Journal of New England Journal of 1994	veno-venous haemofiltration on outcomes of acute renal failure: a prospective randomised trial interinal failure: s prospective randomised trial Paller, MS et al Oxygen free radicals in ischemic acute renal failure in the rat Journal of Clinical 1984 814 McCullough, PA et Acute renal failure after coronary intervention: mortality American Journal of 1997 799 al Incidence, risk factors, and relationship to mortality Medicine 1996 793 Levy, EM et al The effect of acute renal failure on mortality- Acohort analysis JAMA- Journal of the Acohort analysis 1996 793 Rihal, CS et al Incidence and prognostic importance of acute renal failure after percutaneous coronary intervention Kireulation 2022 691 Solomon, R et al Effects of saline, mannitol, and furosemide to New England Journal of 1944 684	veno-venous haemofiltration on outcomes of acute renal failure: a prospective randomised trial	veno-venous haemofilitation on outcomes of icute renal failure: a prospective randomised irial Paller, MS et al Oxygen free radicals in ischemic acute renal failure in the rat Journal of Clinical 984 814 2544 575 McCullough, PA et al Caute renal failure after coronary intervention mortality Merican Journal of Ninol 1997 799 42.05 1016 Levy, EM et al The effect of acute renal failure on mortality- mortality JAMA- Journal of the Acotort analysis 1996 793 39.65 988 Rihal, CS et al Incidence and prognostic importance of acute renal failure after percutaneous coronary intervention Circulation 2002 691 49.36 877 Solomon, R et al Effects of saline, mannitol, and furosemide to New England Journal of 1994 684 31.09 905	veno-venous haemofilitation on outcomes of acute renal failure: a prospective randomised ritil secure renal failure: a prospective randomised ritilitation on outcomes of acute renal failure: a prospective randomised ritilitation on outcomes of acute renal failure in the rat Journal of Clinical 1984 814 25.44 575 17.97 McCullough, PA et acute renal failure after coronary intervention American Journal of 1997 799 42.05 1016 53.47 al Incidence, risk factors, and relationship to mortality Medicine 1997 799 42.05 1016 53.47 Levy, EM et al The effect of acute renal failure on mortality JAMA- Journal of the association 1996 733 8.05 98 49.9 99 Rhal, CS et al Incidence and prognostic importance of acute frequencies coronary intervention American Medical Association 1016 817 202 691 8.93 877 62.64 Stolomon, R et al Effects of saline, mannitol, and furosemide to New England Journal of 1994 684 31.09 905 41.14

2 3										
4 5			prevent acute decreases in renal	Medicine						
6 7			function induced by radiocontrast agents							
9	13	Mehran, R et al	A simple risk score for prediction of contrast-	Journal of the American	2004	677	56.42	844	70.33	15464318
10 11	11 12 13 14 15		induced nephropathy after percutaneous	College of Cardiology						
13			coronary intervention- Development and initial							
14 15			validation							
17	14	Mishra, J et al	Identification of neutrophil	Journal	2003	645	49.62	735	56.54	14514731
18 19	9		gelatinase-associated lipocalin as a novel early	of the American Society of N						
20 21			urinary biomarker for ischemic renal injury	ephrology						
23	15	Chertow, GM et al	Independent association between acute renal	American Journal of	1998	630	35.00	747	41.5	9576407
24 25			failure and mortality following cardiac surgery	Medicine						
27	16	Parfrey, PS	Contrast material-induced renal failure in	New England Journal of	1989	618	22.89	635	23.52	2643041
28 29		et al	patients with diabetes mellitus, renal	Medicine						
30 31			insufficiency, or both. A prospective controlled							
32 33			study							
35	17	Aspelin, P et al	Nephrotoxic effects in high-risk patients	New England Journal of	2003	575	44.23	758	58.31	12571256
36 37	10		undergoing angiography.	Medicine	1007	520	26.00	(22	21.6	0.005700
39	18	Brivet, FG et al	Acute renal failure in intensive care units -	Critical Care Medicine	1996	538	26.90	632	31.6	8605788
40 41 -			Causes, outcome, and prognostic factors of							
42 43										
44 45										

BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de I Enseignement Superieur (ABES) Protected by כאַצענוְמַוּשָׁ*וּוּשָׁוּוּשָׁוּוּשָׁוּפּוּוּפּוּפּוּיפּא*נוּפּוּפּריפּאנפּאנפּן אָמוּאַוּטָט. אָ*ו*וּניאוּאַשָּ אַמַבּנּוּחָאָפּריפוּטוי 2025 at Agence Bibliographique de l

1 2										
3 4 5			hospital mortality: A prospective, multicenter							
5 6 7			study							
0	19	Togel, F et al	Administered mesenchymal stem cells protect	American Journal of	2005	524	47.64	625	56.82	15713913
10 11			against ischemic acute renal failure through	Physiology-Renal						
12 13			differentiation-independent mechanisms	Physiology						
15	20	Merten, GJ et al	Prevention of contrast-induced nephropathy	JAMA- Journal of the	2004	513	42.75	714	59.5	15150204
16 17			with sodium bicarbonate - A randomized	American Medical						
18 19_			controlled trial	Association						
21 22 23 24 25 26 27 28 29 30 31 23 34 35 36 37 8 9 40 41 42 43 44 5 6 47			. (S ເຂຍດີດາດກ່າງ <u>ຈີນເຫຼືອງອາດ</u> ເຈັດທີ່ທີ່ທີ່ເປັນເປັນເປັນເປັນ ເບັ້ນ ເບັ້ນ ເປັນເປັນເປັນເປັນເປັນເປັນເປັນເປັນເປັນເປັນ	38A) nseineut Superieur (ABE	∃ sµ∂aîţ@niþµ	નુર્ગ્યાલ્ફ્યાઇ∤	ited by cppy	Protec	and 15 III TH	
48 ⊿q	l əb	nce Bibliographique	nəpA ts 7202 ,8 ənuL no \moɔ.imd.nəqoimd\\:qt	uly 2016. Downloaded from ht	0530 on 27 Ju	110-9102-	a96/bmjopen	rr.0f as bedzil	n: first pub	BMJ Ope

Table 2. Journals in which the T100 articles were published

Journal	No. of	Impact	5-Year
	Articles (Citations)	Factor	Impact Factor
New England Journal of Medicine	17 (7249)	55.87	54.39
Journal of the American Society of Nephrology	16 (5470)	9.34	5.47
Kidney International	16 (5157)	8.56	7.89
Journal of Clinical Investigation	11 (3930)	13.22	14.05
Lancet	7 (3194)	45.22	42.72
JAMA- Journal of the American Medical Associa	tion 5 (3095)	35.29	31.03
American Journal of Medicine	5 (2138)	5.00	5.26
Critical Care Medicine	5 (1935)	6.31	6.29
American Journal of Physiology-Renal Physiolog	y 4 (1252)	3.25	3.51
Critical Care	4 (4379)	4.48	5.14
Archives of Internal Medicine	4 (1079)	17.33	13.10
Journal of the American College of Cardiology	3 (1238)	16.50	14.10
Medicine	3 (971)	5.72	5.29
Annals of Internal Medicine	3 (864)	17.8	17.47
Proceedings of the National Academy	2 (683)	9.67	10.56
of Sciences of the United States of America			
American Journal of Kidney Diseases	2 (627)	5.90	5.56
Clinical Journal of the American Society of	2 (604)	4.61	5.47
Nephrology			
American Journal of Cardiology	2 (482)	3.28	3.35

Notes: The journals that only published one of the T100 articles were shown below. Values given in parentheses were number of articles, impact factors and the corresponding citations, respectively. Circulation (1, 14.43, 691); Intensive Care Medicine (1, 7.21, 349); Nephrology Dialysis Transplantation (1, 3.58, 304); Anesthesiology (1, 5.88, 263); Circulation Research (1, 11.02, 243); Journal of Thoracic and Cardiovascular Surgery (1, 4.17, 229); International Journal of Molecular Medicine (1, 2.09, 228); American Journal of Physiology (1, NA, 227); Clinical Infectious Diseases (1, 8.89, 226); Annals of Surgery (1, 8.33, 226); Annals of Thoracic Surgery (1, 3.85, 221); European Radiology (1, 4.01, 220).

Page 23 of 47

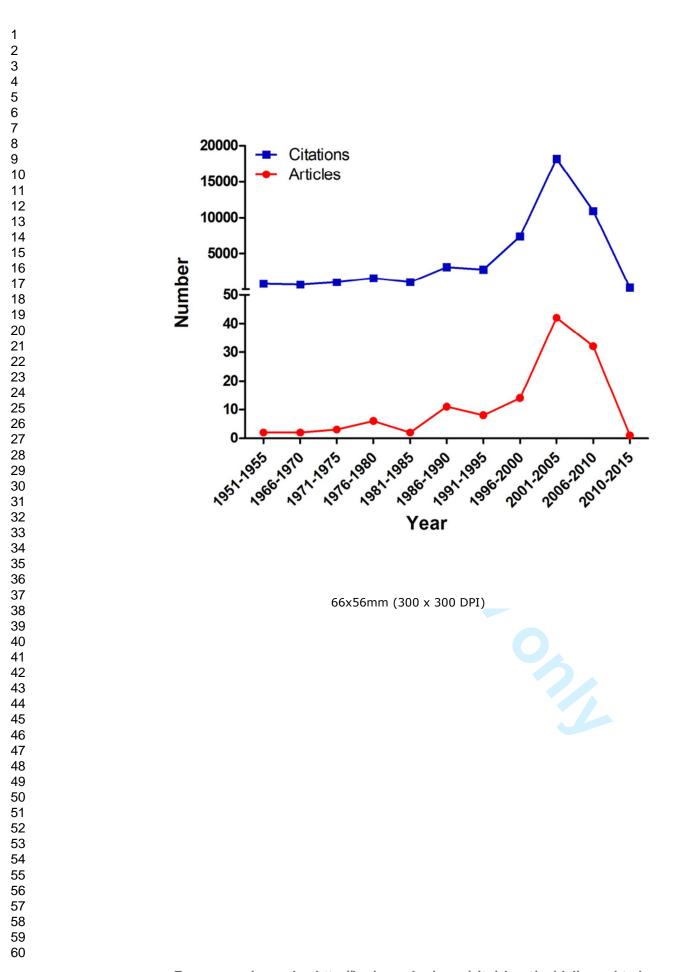
	Author	No. of articles	First	Correspond	Other	Citations (First and Correspond)	Total citations
	Bonventre, JV	10	5	9	1	4263	4527
	Devarajan, P	8	1	5	3	2464	3428
6	Chertow, GM	6	3	5	1	2353	2579
ļ	Mehta, RL	6	4	3	1	2757	4728
5	Parikh, CR	4	2	4		996	813
i	Marenzi, G	3	3	3		813	1095
1	Schrier, RW	3	2	3		1095	1634
}	Camussi, G	2		2		452	452
)	Dangas, G	2	1	2		934	934
0	Kellum, JA	2				1788	1788
1	McCullough, PA	2	2	2		1101	1101
2	Schiffl, H	2	2	2		677	677
3	Westenfelder, C	2		2		761	761
4	Parfrey, PS	2	1	2	1	892	892
5	Bates, DW	2	1	1	1	226	1119
6	Coca, S. G	2	2			486	486

Page 24 of 47

BMJ Open

Table 4. Institutions with two or more to	p cited articles on acute kidney injury
---	---

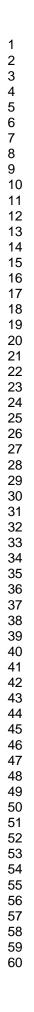
Rank	Institution	No. of Articles	Citations
1	Brigham and Women's Hospital, Boston, USA	9	4263
2	Cincinnati Children's Hospital Medical Center, Cincinnati, USA	5	2464
3	University of California, San Francisco, USA.	5	2353
4	Yale University, West Haven, USA	4	996
5	University of California, San Diego, USA	3	2757
6	The University of Milan, Milan, Italy	3	813
7	University of Colorado, Denver, USA	3	1095
8	University of Torino, Torino, Italy	2	452
9	Columbia University, New York, USA	2	934
10	William Beaumont Hospital, Royal Oak, USA	2	1101
11	University of Munich, Munich, Germany	2	677
12	Veterans Affairs medical center, Salt Lake City, USA	2	761
13	Memorial University of Newfoundland, City of Saint John, Canada	2	892

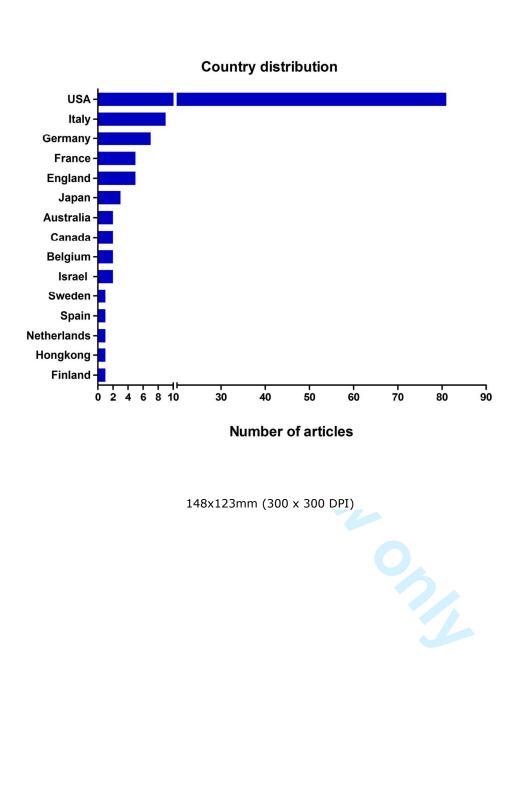


BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES)

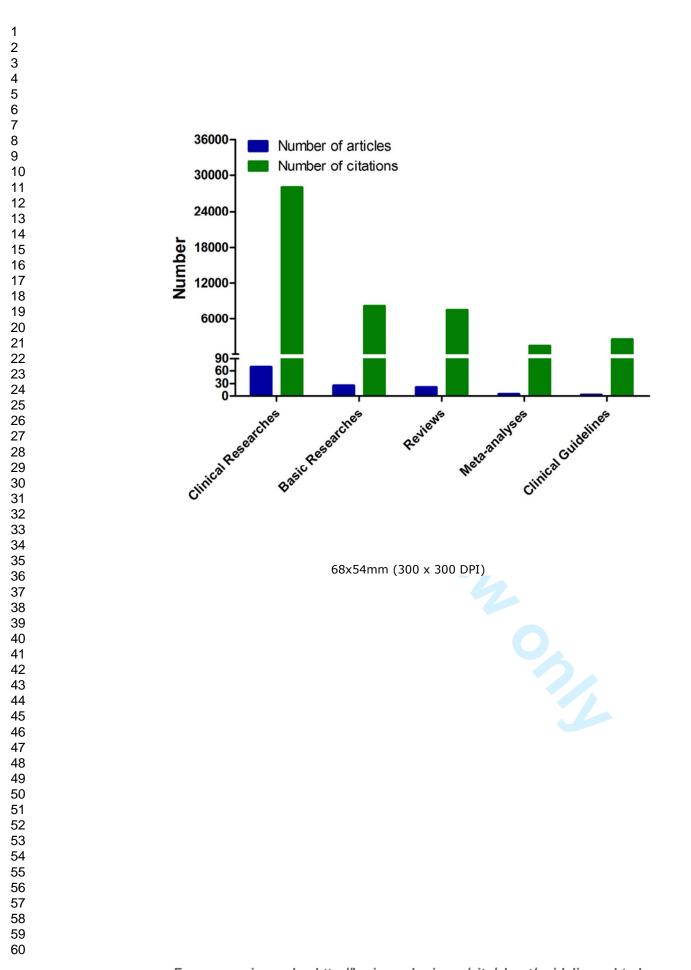
Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

BMJ Open





For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

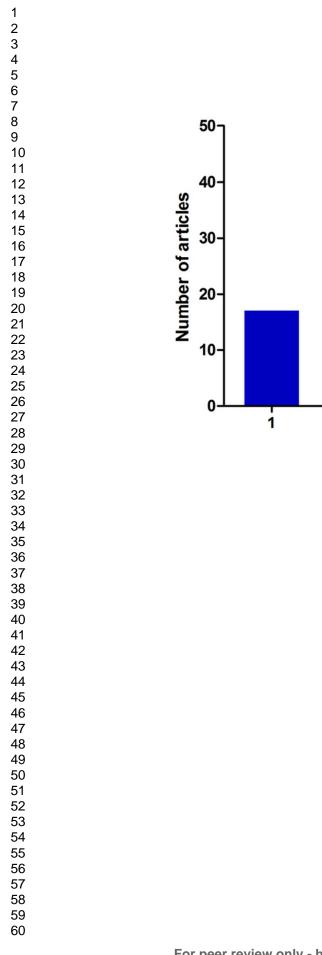


BMJ Open: first published as 10.1136/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

2

Levels of evidence

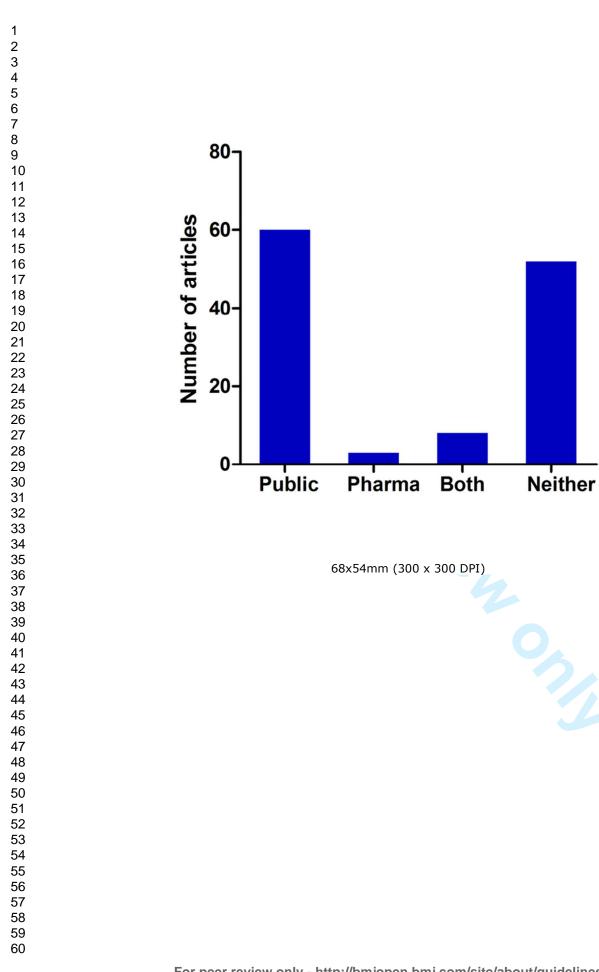
64x48mm (300 x 300 DPI)





3

4



4			BMJ Open	/bmjopen-2 4 by copyrig			Page	30 of 47
1 2 3 4 5 <u>Ta</u>	ble S1. Bibliometric info	ormation of the other T100 articles in acute kid	lney injury which were not shown in	016-011630 o n : nt, includin@fc n Tatefc				
7 9 ¦ ank 10	Authors	Title	Journal	27 July 2016 Engreigne r usegrelat Y	Times Cited (Web)	Citation Index (Web)	Times Cited (Scoups)	((
11 12 21 13 14	Palevsky, PM et al	Intensity of renal support in critically ill patients with acute kidney injury	New England Journal of Medicine	3. Downloaded from sment Superieur (AB eego text and data n	510	63.75	607	
15 16 22 17 18 19 20 21 22	Oliver, J et al	The pathogenesis of acute renal failure associated with traumatic and toxic injury; renal ischemia, nephrotoxic damage and the ischemic episode	Journal of Clinical Investigation	ninir S)	498	7.66	NA	
23 24 23 25 26 27 28	Hoste, EA et al	RIFLE criteria for acute kidney injury are associated with hospital mortality in critically ill patients: a cohort analysis	Critical Care	://bmjopen.bmj.com/ on June 9, ng, Al traineg, and similar echi	491	49.10	652	_
29 30 24 31 32 33 34	Kelly, KJ et al	Intercellular adhesion molecule-1-deficient mice are protected against ischemic renal injury	Journal of Clinical Investigation	2025 at A nologies.	471	23.55	501	
35 36 25 37 38 39 40 41 42 43 44 45	Schrier, RW et al	Mechanisms of disease: Acute renal failure and sepsis For peer review only - http://br	New England Journal of Medicine mjopen.bmj.com/site/about/guidelin	gence Bibliographique de es.xhtm⊏	465	38.75	251	
40 41 42 43 44		For peer review only - http://b	mjopen.bmj.com/site/about/guidelin	de				

Page 31 1 2 3 4	of 47		BMJ Open	/bmjopen-2016-011630 on 4 by copyright, including 1			
5 26 6 7 8 9 10	Liano, F et al	Epidemiology of acute renal failure: A prospective, multicenter, community-based study	Kidney International	3-011630 on 27 July 2016. Downloaded f 6 Enseignement Superieu 1 for uses relate⊕to test and d 2 2	464	23.20	563
$^{11}_{12}27$	Lameire, N et al	Acute renal failure	Lancet	2000 Constant	439	39.91	569
¹³ 28 14 15 16 17 18	Metnitz, PGH et al	Effect of acute renal failure requiring renal replacement therapy on outcome in critically ill patients	Critical Care Medicine	wnloaded from h t Superieur (ABE 2 2	438	31.29	534
¹⁹ 20 20 21 22	Grossman, RA et al	Nontraumatic rhabdomyolysis and acute renal failure	New England Journal of Medicine	d from http://bmjopen.bm eur (ABES)t. 9 data min⊕g, Al train⊛ng, 1	433	10.31	215
$^{23}_{24}30$	Star, RA et al	Treatment of acute renal failure	Kidney International		428	23.78	501
25 31 26 31 27 28	Schiffl, H et al	Daily hemodialysis and the outcome of acute renal failure	New England Journal of Medicine	1, 2000 simila	415	29.64	549
29 30 31 32 33 34	Hollenbe.NK et al	Acute oliguric renal failure in man: evidence for preferential renal cortical ischemia	Medicine	j.com/ on June 9, 2025 at A ∰d similar % Chnologies.	409	8.52	105
35 33 36 37 38 39 40 41 42 43 44 45 46 47	Uchino, S et al	An assessment of the RIFLE criteria for acute renal failure in hospitalized patients For peer review only - http://br	Critical Care Medicine mjopen.bmj.com/site/about/guidelir	gence Bibliographique de	407	40.70	475

1 2 3 4			BMJ Open	/bmjopen-2016-011630 on 27 9 by copyright, including for u			Page 32 of 47
5 34 7 8	Bonventre, JV et al	Recent advances in the pathophysiology of ischemic acute renal failure	Journalof the American Society of Nephrology	20903 g	401	30.85	448
9 10 11 12 13 14 15 16 17 18	Haase, M et al	Accuracy of Neutrophil Gelatinase-Associated Lipocalin (NGAL) in Diagnosis and Prognosis in Acute Kidney Injury: A Systematic Review and Meta-analysis	American Journal of Kidney Diseases	7 July 2016. Downloaded from h Ensegynement Superieur (ABE uses Bated to text and data m	394	56.29	479
¹⁹ 20 21 22 23 24	Fouque, D et al	A proposed nomenclature and diagnostic criteria for protein-energy wasting in acute and chronic kidney disease	Kidney International	om http://bmjopen.bm (ABES) ta mintag, Al training, 2	392	49.00	454
25 26 37 27 28	Herget-Rosenthal, S et al	Early detection of acute renal failure by serum cystatin C	Kidney International	2004 similar	384	32.00	488
29 30 31 32 33 34 35 36	Mueller, C et al	Prevention of contrast media-associated nephropathy - Randomized comparison of 2 hydration regimens in 1620 patients undergoing coronary angioplasty	Archives of Internal Medicine	June 9, 2025 at Agenci ar tæchnologies.	372	26.57	541
37 38 39 40 41 42 43 44 45 46 47	Morigi, M et al	Mesenchymal stem cells are renotropic, For peer review only - http://br	Journal of the American njopen.bmj.com/site/about/guideline	e Bibliographique de	369	30.75	433

Page 33	of 47		BMJ Open	/bmjopen-2016 I by copyright,			
2 3 4 5 6 7 8		helping to repair the kidney and improve function in acute renal failure	Society of Nephrology	-011630 on 27 Jul En including for use			
9 10 40	Bonventre, JV et al	Mechanisms of ischemic acute renal failure	Kidney International	y 2016 serigne s Belat	366	15.91	359
11 12 41 13 14 15 16	Kelly, KJ et al	Antibody to intercellular adhesion molecule 1 protects the kidney against ischemic injury	e	. Downloaded fri ment Superieur edto text and da	354	16.09	345
17 18 42 19 20	Devarajan, P et al	Update on mechanisms of ischemic acute kidney injury	Journal of the American Society of Nephrology	om http://br (ABES) . ta mining, /	351	35.10	370
21 22 43 23 24 25	de Mendonca, A et al	Acute renal failure in the ICU: risk factors and outcome evaluated by the SOFA score	Intensive Care Medicine	njopen.bmj 2@aining,	349	21.81	436
25 26 44 27 28 29 30 31 32	Abel, RM et al	Improved survival from acute renal failure after treatment with intravenous essential L-amino acids and glucose. Results of a prospective, double-blind study	-	/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at A Ensergnement Superieur (ABES) . 0 4 by copyright, including for uses 民ated我 text and data mining, Al Baining, ard similar technologie 89	345	8.02	133
33 34 45 35 36 37 38 39 40 41 42 43 44 45 46 47	Humes, HD et al	Epidermal growth factor enhances renal tubule cell regeneration and repair and accelerates the recovery of renal function For peer review only - http://br	Journal of Clinical Investigation	gence Bibliographique de	336	12.44	217

1 2 3 4 5 6		in postischemic acute renal failure	BMJ Open	/bmjopen-2016-011630 on 2 1 by copyright, including fo			Page 34 of 47
7 46 8 9 10	Bonventre, JV et al	Ischemic acute renal failure: An inflammatory disease?	Kidney International	27 July 2010 Ænseign 2@es relat	335	27.92	368
¹¹ 47 12 13 14	Schrier, RW et al	Acute renal failure: definitions, diagnosis, pathogenesis, and therapy	Journal of Clinical Investigation	y 2016. Downloaded t seignement Superieu s relatestto text and d 1	332	27.67	376
15 48 16 17 18 19 20	Kawaida, K et al	Hepatocyte growth factor prevents acuterenalfailureandacceleratesrenalregeneration in mice	Proceedings of the National Academy of Sciences of the United States of America	rom http:// r (ABES) . lata mining	329	14.95	309
21 49 22 23 23 24	Ricci, Z. et al	The RIFLE criteria and mortality in acute kidney injury: A systematic review	Kidney International	, ADR 2007raining, and 2006 com	325	40.63	374
25 50 26 27 28	Marenzi, G et al	N-acetylcysteine and contrast-induced nephropathy in primary angioplasty	New England Journal of Medicine	√ on simil	323	32.30	402
²⁹ 51 30 31 32	Akcan-Arikan, A et al	Modified RIFLE criteria in critically ill children with acute kidney injury	Kidney International	June 9, 2025 ar & Chnologi 2	320	35.56	368
³³ 52 35 36	Ishani, Areef et al	Acute Kidney Injury Increases Risk of ESRD among Elderly	Journal of the American Society of Nephrology	gigg.99	319	45.57	364
37 53 38 39 40 41 42 43 44 45 46 47	Mehta, RL et al	Spectrum of acute renal failure in the For peer review only - http://br	Kidney International njopen.bmj.com/site/about/guideline	2004 Bibliographique de	315	26.25	368

Page 35	of 47		BMJ Open	/bmjoper 1 by copy			
1 2 3 4 5 6 7 8		intensive care unit: The PICARD experience		/bmjopen-2016-011630 on 27 July Ense by copyright, including for uses			
9 54 10 11 12	Rosner, Mitchell H et al	Acute kidney injury associated with cardiac surgery	Clinical Journal of the American Society of Nephrology	y 2016. Do seignemer seignated to	310	31.00	341
¹³ 55 14 55 15 16 17 18	Mehta, RL et al	A randomized clinical trial of continuous versus intermittent dialysis for acute renal failure	Kidney International	2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at , eignement Superieur (ABES). @lated to text and data minegy, Al training, and similar &chnologies.	309	20.60	401
¹⁹ 56 21 22 23 24	Hakim, RM et al	Effect of the dialysis membrane in the treatment of patients with acute renal failure	-	tttp://bmjopen.br ≘SH: in⊕g, Al training	307	13.95	287
²⁵ 57 26 27 28	Conlon, PJ et al	Acute renal failure following cardiac surgery	Nephrology Dialysis Transplantation	nj.com/ on 1999 1990 simili	304	17.88	395
29 58a 30 31 32 33 34 35 36 37 38	Nickolas, Thomas L et al	Sensitivity and specificity of a single emergency department measurement of urinary neutrophil gelatinase-associated lipocalin for diagnosing acute kidney injury	Annals of Internal Medicine	Agence	303	37.88	344
39 40 41 42 43 44 45 46 47		For peer review only - http://br	njopen.bmj.com/site/about/guideline	Bibliographique de F			

1 2 3			BMJ Open	/bmjopen-2016-011630 d by copyright, includin			Page 36 of 47
4 5 58b 7 8	Anderson, RJ et al	Nonoliguric acute renal failure	New England Journal of Medicine	5-011630 on 27 July 7 Ens including for uses	303	7.77	157
9 59a 10 11 12	McCullough, Peter A et al	Contrast-induced acute kidney injury	Journal of the American College of Cardiology		302	37.75	366
13 59b 14 15 16	Zager, RA et al	Rhabdomyolysis and myohemoglobinuric acute renal failure	Kidney International	6. Downloaded from h ement Superieur (ABE led to text and date m 1	302	15.10	372
¹⁷ 59c	Swann, RC et al	The clinical course of acute renal failure	Medicine	attom 1	302	4.79	2
19 20 21 22 23 24	Better, OS et al	Early management of shock and prophylaxis of acute renal failure in traumatic rhabdomyolysis	New England Journal of Medicine	tttp://bmjopen.bm ESD. inegg, Al training,	301	11.58	331
²⁵ 61 26 27 28	Miller, TR et al	Urinary diagnostic indices in acute renal failure: a prospective study	Annals of Internal Medicine		298	7.84	163
29 62 30 31 32 33 34	Xue, Jay L et al	Incidence and mortality of acute renal failure in Medicare beneficiaries, 1992 to 2001		i.com/ on June 9, 2025 at <i>/</i> 初d similar 瑷chnologies.	296	29.60	326
³⁵ 63 36 37 38	Bennett, Michael et al	Urine NGAL predicts severity of acute kidney injury after cardiac surgery: A		2008 Bib	294	36.75	344
39 40 41 42 43 44 45 46 47		For peer review only - http://br	njopen.bmj.com/site/about/guidelin	iographique de es.xhtmΓ			

Page 37	of 47		BMJ Open	/bmjopen-2016-011630 on 4 by copyright, including f			
4 5 6		prospective study					
7 64 8 9 10	Ostermann, Marlies et al	Acute kidney injury in the intensive care unit according to RIFLE	Critical Care Medicine		288	32.00	324
11 65 12 65 13 14 15 16	Noiri, E et al	In vivo targeting of inducible NO synthase with oligodeoxynucleotides protects rat kidney against ischemia	Journal of Clinical Investigation	y 2016. Downloaded f seignentent Superieu s related to text and d	277	13.85	272
17 66 18 19 20 21 22	Oken, DE et al	Glycerol-induced hemoglobinuric acute renal failure in the rat. I. Micropuncture study of the development of oliguria	Journal of Clinical Investigation	d from http://bmjoper eur (ABES) . d date/mining, Al train	275	5.50	65
²³ 67 24 25 26	Barrett, BJ et al	Preventing nephropathy induced by contrast medium	New England Journal of Medicine	2(B)6 b mj.cc	274	27.40	347
27 28 29 30 31 32	Parikh, C. R. et al	Urinary IL-18 is an early predictive biomarker of acute kidney injury after cardiac surgery	Kidney International	m/ on June 9, 2025 d si⊞lar technologi	267	26.70	309
33 34 35 36 37 38	Payen, Didier et al	A positive fluid balance is associated with a worse outcome in patients with acute renal failure	Critical Care	2(33).8 2(33).8	265	33.13	309
39 40 41 42 43 44 45 46 47		For peer review only - http://bi	mjopen.bmj.com/site/about/guideline	Bibliographique de es.xhtmF			

			BMJ Open	/bmjopen-2016 4 by copyright,			Page 38 of 47
1 2 3 4 5 70a 7 8 9 10	Ichimura, T et al	Kidney injury molecule-1: a tissue and urinary biomarker for nephrotoxicant-induced renal injury	American Journal of Physiology-Renal Physiology	/bmjopen-2016-011630 on 27 July 2016. De 4 by copyright, including for uses relate 2	264	22.00	330
11 70b 12 13 14 15 16 17 18 19 20	Bouman, CSC et al	Effects of early high-volume continuous venovenous hemofiltration on survival and recovery of renal function in intensive care patients with acute renal failure: A prospective, randomized trial	Critical Care Medicine	6. Downloaded from http://t ement Superieur (ABES) . te⊛to text and data mining, 2	264	18.86	303
2171a 22 23 24 25 26 27 28	Wagener, Gebhard et al	Association between increases in urinary neutrophil gelatinase-associated lipocalin and acute renal dysfunction after adult cardiac surgery	Anesthesiology	ABraining, and similar Achnologies	263	26.30	312
29 71b 30 31 32	Koffler, A et al	Acute renal failure due to nontraumatic rhabdomyolysis	Annals of Internal Medicine	June 9, 202 ar %chnolo	263	6.58	117
33 34 35 36 37 38 39 40 41 42 43 44 45 46	Chertow, GM et al	Prognostic stratification in critically ill patients with acute renal failure requiring dialysis For peer review only - http://br	Archives of Internal Medicine mjopen.bmj.com/site/about/guidelir	Agence Bibliographique de	262	12.48	282

Page 39 1 2 3 4	of 47		BMJ Open	/bmjopen-2016-011630 on 4 by copyright, including f			
5 72b 6 7 8	Schiffl, H et al	Biocompatible membranes in acute renal failure: prospective case-controlled study	Lancet	5-011630 on 27 July 4 Ense including for uses	262	11.91	242
9 73a 10 11 12	Birck, R et al	Acetylcysteine for prevention of contrast nephropathy: meta-analysis	Lancet	y 2016. Dov serignemen selated to 2	260	20.00	388
¹³ 7 3b 14 15 16	Byrd, L et al	Radiocontrast-induced acute renal failure: a clinical and pathophysiologic review	Medicine	wnloaded f t Superieur 1 1 1 1 1	260	7.03	123
17 74a 18 19 20 21 22	Marenzi, G et al	Contrast-induced nephropathy in patients undergoing primary angioplasty for acute myocardial infarction	-	2016. Downloaded from http://bmjope eignement Superieur (ABES) . Bated to text and datemining, AI trai	259	21.58	297
23 74b 24 25 26 27 28	Ali, Tariq et al	Incidence and outcomes in acute kidney injury: A comprehensive population-based study		n.bmj.com/ on 1∰g, and simil	259	28.78	297
²⁹ 75a 30 31 32 33 34	Sharples, EJ et al	Erythropoietin protects the kidney against the injury and dysfunction caused by ischemia-reperfusion		June 9, 2025 at A ar & Chnologies.	257	21.42	287
³⁵ 7 5b 36 37 38	Dangas, G et al	Contrast-inducednephropathyafterpercutaneouscoronaryinterventionsin	American Journal of Cardiology	2005 ce Bibl	257	23.36	309
39 40 41 42 43 44 45 46 47		For peer review only - http://bi	mjopen.bmj.com/site/about/guideline	Bibliographique de es.xhtmΓ			

1 2 3			BMJ Open	/bmjopen-2016-011630 on d by copyright, including f			Page 40 of 47
4 5 6 7 8		relation to chronic kidney disease and hemodynamic variables		or 2			
9 76 10 11 12	Thakar, CV et al	A clinical score to predict acute renal failure after cardiac surgery	Journal of the American Society of Nephrology	7 July 2016. Down Enseignement & uses Blated to tr 2	254	23.09	304
¹³ 77a 14 15 16	Mehta, RL et al	Diuretics, mortality, and nonrecovery of renal function in acute renal failure	JAMA- Journal of the American Medical Association	wnloaded from t t Superieur (AB t Stand dat 2 2 2	253	18.07	290
17 77b 18 19 20 21	Coca, S. G et al	Biomarkers for the diagnosis and risk stratification of acute kidney injury: A systematic review	Kidney International	nttp://b ES) . vining,	253	31.63	351
22 23 77c 24 25 26 27 28	Bonventre, JV et al	Dedifferentiation and proliferation of surviving epithelial cells in acute renal failure	Journal of the American Society of Nephrology	2003 2007 2007 2007 2007 2007 2007 2007	253	19.46	300
29 78 30 78 31 32 33 34	Norman, DJ et al	Myolysis and acute renal failure in a heart-transplant recipient receiving lovastatin	-	June 9, 2025 at A 8 ar Schnologies.	252	9.00	162
35 79 36 37 37 38	Tomita, K et al	Plasma endothelin levels in patients with acute renal failure	New England Journal of Medicine	1989 nce Bibl	250	9.26	140
39 40 41 42 43 44 45 46 47		For peer review only - http://br	njopen.bmj.com/site/about/guidelin	iographique de es.xhtmΓ			

Page 41	of 47		BMJ Open	/bmjopen- 1 by copyri			
1 2 3 4 5 8 7 8 9 10	Lin, FM et al	Hematopoietic stem cells contribute to the regeneration of renal tubules after renal ischemia-reperfusion injury in mice		/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at . 3 Enseignement Superieur (ABES) . 5 4 by copyright, includin妥for uses relate会to text and dat会mining, Al train缺g, and similar 袅chnologies.	247	19.00	304
11 81 12 13 14 15 16	Sutton, TA et al	Microvascular endothelial injury and dysfunction during ischemic acute renal failure	Kidney International	6. Downloaded f ernent Superieur erecto text and d	244	17.43	271
17 82a 18 19 20 21 22	Arendshorst, WJ et al	Pathogenesis of acute renal failure following temporary renal ischemia in the rat	Circulation Research	rom http://bmjop · (ABES) . atermining, Al tra	243	5.93	285
23 82b 24 25 26 27 28	Parikh, CR et al	Urine IL-18 is an early diagnostic marker for acute kidney injury and predicts mortality in the intensive care unit		en.bmj.com/ on , 1005 2009, and simila	243	22.09	83
29 83a 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	Kay, J et al	Acetylcysteine for prevention of acute deterioration of renal function following elective coronary angiography and intervention - A randomized controlled trial For peer review only - http://br		Agence Bibliographique de	239	18.38	327

1 2 3 4			BMJ Open	/bmjopen-2016-011630 on 2 d by copyright, includin⊛for			Page 42 of 47
5 83b 6 7 8 9 10	Shusterman, N et al	Riskfactorsandoutcomeofhospital-acquiredacuterenalfailure.Clinical epidemiologic studystudystudystudy	American Journal of Medicine	on 27 July 20 7 Enseig 19 for uses re	239	8.24	254
11 83c 12 13 14	Bonventre, Joseph V et al	Cellular pathophysiology of ischemic acute kidney injury	Journal of Clinical Investigation	016. Downloa gne me nt Sup latea to text a	239	47.80	228
15 84a 16 17 18 19 20	Togel, Florian et al	Vasculotropic, paracrine actions of infused mesenchymal stem cells are important to the recovery from acute kidney injury		ided from http:// erieur (ABES) . an&data mining, 2	237	26.33	284
20 21 84b 22 23 24 25 26	Burne, MJ et al	Identification of the CD4(+) T cell as a major pathogenic factor in ischemic acute renal failure	Journal of Clinical Investigation	AB AB AB Araining, and	237	15.80	267
27 84c 28 29 30	Waikar, Sushrut S et al	Declining mortality in patients with acute renal failure, 1988 to 2002	Journal of the American Society of Nephrology	n/ on June S⊞ilar tec	237	23.70	254
31 32 85a 33 34 35 36	Melnikov, VY et al	ImpairedIL-18processingprotectscaspase-1-deficientmicefromischemicacute renal failure </td <td>Journal of Clinical Investigation</td> <td>June 9, 2025 at Agenc lar technologies.</td> <td>236</td> <td>15.73</td> <td>253</td>	Journal of Clinical Investigation	June 9, 2025 at Agenc lar technologies.	236	15.73	253
37 85b 38 39 40	Cigarroa, RG et al	Dosing of contrast material to prevent	American Journal of Medicine	e Bibliogr	236	8.74	282
40 41 42 43 44 45 46 47		For peer review only - http://br	njopen.bmj.com/site/about/guideline	aphique de es.xhtmΓ			

Page 43 1 2 3 4	of 47		BMJ Open	/bmjopen-2016-011630 on 27 4 by copyright, including for u			
5 6 7 8		contrast nephropathy in patients with renal disease		0 on 27 Jul Ens ing for uses			
9 86 10 11 12 13 14 15 16 17 18	Vinsonneau,Christoph e et al	Continuous venovenous haemodiafiltration versus intermittent haemodialysis for acute renal failure in patients with multiple-organ dysfunction syndrome: a multicentre randomised trial	Lancet	July 2016. Downloaded from ht Ensegnement Superieur (ABE uses glated to text and data mi	235	23.50	312
¹⁹ 87	Thurau, K et al	Acute renal success. The unexpected logic of oliguria in acute renal failure	American Journal of Medicine		234	5.85	121
21 22 23 88a 24 25 26	Firth, JD et al	Endothelin: an important factor in acute renal failure?	Lancet	tp://bmjopen.bmj.com/ on So. 1999, Al train 1999, and site 2009	233	8.32	276
27 88b 28 30 31 32 33 34	Coca, Steven G et al	Long-termRisk ofMortalityandOtherAdverseOutcomesAfterAcuteKidneyInjury:ASystematicReviewandMeta-analysis		June 9, 2025 at A lar technologies.	233	33.29	110
35 89 36 37 38 39 40 41 42 43 44 45 46 47	Marenzi, G et al	radiocontrast-agent-induced nephropathy	New England Journal of Medicine njopen.bmj.com/site/about/guideline	gence Bibliographique de	231	17.77	355

$\begin{array}{c}1\\2\\3\\4\\5\\6\\7\\90\\9\\10\\11\\12\\13\\91a\\14\\15\\16\\17\\18\\19\\91b\\20\\21\\22\\23\\24\\25\\92a\\27\\28\\29\\30\\31\\92b\\33\\34\\35\\36\\37\\38\\39\\40\\41\\42\\43\\44\\546\\47\end{array}$		by hemofiltration	BMJ Open	/bmjopen-2016-011630 on 1 by copyright, including f			Page 44 of 47
	Zanardo, G et al	- -	Journal of Thoracic and Cardiovascular Surgery	27 Jul or Been	229	10.41	275
	Herrera, MB et al	Mesenchymal stem cells contribute to the renal repair of acute tubular epithelial injury		y 2016. Downloaded from h seignement Superieur (ABE s related to text and data m 2	228	19.00	273
	Bouchard, Josee et al	Fluid accumulation, survival and recovery of kidney function in critically ill patients with acute kidney injury	Kidney International	integ.//bmjopen.br SP: integ, Al training 2	228	32.57	264
	Vaidya, VS et al	Urinary kidney injury molecule-1: a sensitive quantitative biomarker for early detection of kidney tubular injury	American Journal of Physiology-Renal Physiology	nj.com∕ on June 2∰d similar tec	227	22.70	294
	Rich, MW et al	Incidence, risk factors, and clinical course of acute renal insufficiency after cardiac catheterization in patients 70 years of age or older. A prospective study	Archives of Internal Medicine	Agence	227	8.73	283
		For peer review only - http://br	njopen.bmj.com/site/about/guidel	Bibliographique de ines.xhtmΓ			

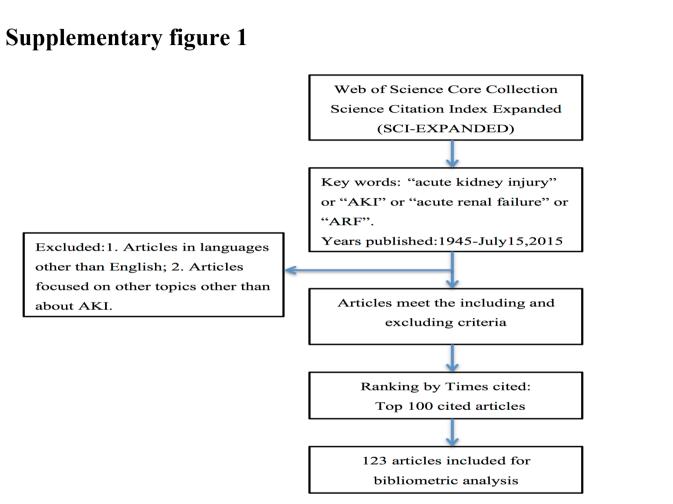
Page 45 of 47		BMJ Open	/bmjopen- 1 by copyr				
1 2 3 4 5 9 2c 7 8	Stein, JH et al	Current concepts on the pathophysiology of acute renal failure	American Journal of Physiology	/bmjopen-2016-011630 on 27 July 2016. Downloaded 8 Enseignement Superier 4 by copyright, including for uses clated to text and 1 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	227	5.97	64
9 93a 10 11 12	Bates, DW et al	Mortality and costs of acute renal failure associated with amphotericin B therapy	Clinical Infectious Diseases	y 2016. Dov seignement selated to 2	226	15.07	285
13 93b 14 15 16	Richards, WO et al	Acute renal failure associated with increased intra-abdominal pressure	Annals of Surgery	vnloaded f Superieur 194t and d	226	6.85	213
17 94a 18 19 20	Supavekin, S et al	Differential gene expression following early renal ischemia/reperfusion	Kidney International	rom http://b (ABES) . 20mining,	225	17.31	242
20 21 94b 22 23 24 25 26	Diaz-Sandoval, LJ et al	Acetylcysteinetopreventangiography-related renal tissue injury (theAPART Trial)	American Journal of Cardiology		225	16.07	296
27 95 28 29 30 31 32	Bruno, Stefania et al	MesenchymalStemCell-DerivedMicrovesiclesProtectAgainstAcuteTubular Injury	Journal of the American Society of Nephrology	Agraining, and signar technologies	224	32.00	230
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	Liangos, Orfeas et al	Urinary N-acetyl-beta-(D) -glucosaminidase activity and kidney injury molecule-1 level are associated with For peer review only - http://br	Journal of the American Society of Nephrology mjopen.bmj.com/site/about/guideline	Agence Bibliographique de	222	24.67	260

1 2 3 4 5 6 7 97 9 10		adverse outcomes in acute renal failure	BMJ Open	/bmjopen-2016-011630 on 1 by copyright, including f			Page 46	6 of 47
	Kuitunen, A et al	Acute renal failure after cardiac surgery: Evaluation of the RIFLE classification	Annals of Thoracic Surgery	n 27 July 2016. Downloaded from http://bmjop @enseignement Superieur (ABES). for eses related to text and data mineg, Al tra	221	22.10	255	
11 98 12 13 14	Morcos, SK et al	Contrast-media-induced nephrotoxicity: a consensus report	European Radiology	6. Downloa lengent Sup teg to text	220	12.94	290	
15 99 16 17 18	Ward, MM et al	Factors predictive of acute renal failure in rhabdomyolysis	Archives of Internal Medicine	aded from h beriœur (ABI ange data m	218	7.79	242	
¹⁹ 20 20 21 22	Heyman, SN et al	Acute renal failure with selective medullary injury in the rat	Journal of Clinical Investigation	http://bmjop ESo: iinf&g, Al tra	215	7.68	156	
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 5 46 47		For peer review only - http://br	njopen.bmj.com/site/about/guidelin	en.bmj.com/ on June 9, 2025 at Agence Bibliographique de L ining, and similar technologies.				

/bmjopen-2016-011630 on 27 July 2016. Downloaded from http://bmjopen.bmj.com/ on June 9, 2025 at Enseignement Superieur (ABES) . I by copyright, including for uses related to text and data mining, Al training, and similar technologies.

ttp://bmjopen.bmj.com/ on June 9, 2025 at Agence Bibliographique

de





For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

Correction: Hundred top-cited articles focusing on acute kidney injury: a bibliometric analysis

Liu Y-hui, Wang S-qi, Xue J-hua, *et al.* Hundred top-cited articles focusing on acute kidney injury: a bibliometric analysis. *BMJ Open* 2016;6:e011630. The published affiliations of the authors in this article were incorrect. The correct affiliations are given below.

Ning Tan, Yuan-hui Liu, Yong Liu, Ji-yan Chen, Peng-cheng He and Ning Tan: Department of Cardiology, Guangdong Cardiovascular Institute, Guangdong Provincial Key Laboratory of Coronary Heart Disease Prevention, Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou 510100, Guangdong, China;

Sheng-qi Wang: ¹Department of Mammary Disease, Guangdong Provincial Hospital of Chinese Medicine, The Second Clinical College of Guangzhou University of Chinese Medicine, Guangzhou, China; ²Department of Pharmacy, Nanfang Hospital, Southern Medical University, 1038 Guangzhou, China.

Guo-feng Li: Department of Pharmacy, Nanfang Hospital, Southern Medical University, Guangzhou, 510515, China.

Jin-hua Xue: ¹Department of Pathophysiology, School of Basic Medical Sciences, Southern Medical University, Guangzhou, 510515, China. ²Department of Physiology, School of Basic Medical Sciences, Gannan Medical University, Ganzhou, 341000, China.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/

BMJ Open 2016;**6**:e011630corr1. doi:10.1136/bmjopen-2016-011630corr1

