

Nephrology Research Output in Iran in a Decade

Behzad Einollahi

Nephrology and Urology
Research Center, Baqiyatallah
University of Medical Sciences,
Tehran, Iran

Keywords. bibliometrics,
medical research, publications,
kidney transplantation,
nephrology, Iran

Introduction. We performed a bibliometric search to evaluate the number of papers written by the Iranian nephrologists.

Materials and Methods. We considered all peer-reviewed articles published by nephrologists in biomedical journals quoted by the Medline database and the IranMedex (an Iranian database for indexing medical articles of local journals) between 1997 and 2007. The findings were analyzed according to the university from which the publication was originated, field of study, type of work, specialty of the first author (nephrologist or nonnephrologist), type of journal (indexed or nonindexed in Medline), total number of publications, the annual and 10-year collaboration rate of the Iranian nephrologists, and publications per faculty members of medical institutions.

Results. The total number of publications in the field kidney disease was 579 (average of 58 papers per year). There was an increasing trend in the number of publications over the years. More than 56% of the publications (324) were in the internationally recognized journals that were indexed in the Medline. The majority of the papers were concerned with transplantation (58.3%), nephrology (20.0%), and hemodialysis (16.8%). Of all the publications traced in this study, 67.5% were retrospective articles, whereas the proportion of clinical trials was relatively small (6.1%).

Conclusions. Iran's contribution to the research on kidney disease is not satisfactory in terms of the volume and quality of publications. On the other hand, the data suggest that there was a significant research activity in the field of kidney transplantation during the studied period.

IJKD 2007;1:57-62
www.ijkd.org

INTRODUCTION

In the recent few decades, Iran has witnessed developments in the fields of medicine and public health care. During the past 2 decades, Iran has enjoyed considerable expansion of trained individuals in the fields of medicine.¹ Biomedical research has had a great impact on researchers, health professionals, and policy makers. While the publication of scientific results is the key phase in scientific work, bibliometric studies such as evaluating the number and trend of published articles are used as an adjunct to assess scientific

performance of a country.² However, to date, little is known about contributions of the Iranian medical researchers to the field of nephrology. Research output can be measured by quantity based on local and international journals. The objectives of this study were to evaluate the research done in Iran on kidney disease and transplantation during the past decade and to determine the time trend over that period, according to the figures of medical publications by the Iranian nephrologists and other medical investigators.

MATERIALS AND METHODS

Papers published by 102 members of the Iranian Society of Nephrology between June 1997 and June 2007 were analyzed using web-based databases. We performed a comprehensive computerized search of each Iranian nephrologist's publications in English and Farsi in general medical and nephrological journals being indexed in the PubMed database and IranMedex for each year of the studied period. The latter online service lists articles published in the Iranian biomedical journals.³ It should be noted that only publications on nephrology topics were included in the study. The findings were analyzed according to the following criteria: (1) name of the institution from which the publication was originated according to the affiliation of the first author; (2) field of the study, categorized as transplantation, hemodialysis, peritoneal dialysis, nephrology, and other issues; (3) type of the work, regarded as retrospective studies, clinical trials, and case report; (4) the specialty of the first author, divided into nephrologist and nonnephrologist; (5) type of the journal, as indexed or not indexed in the Medline; (6) total number of publications and the collaboration rate of the Iranian nephrology community for every year and the whole studied period; and (7) publications per member of institution.

The number of published articles was considered as an index of quantity of research productivity. In addition, the number of articles published by faculty members of each medical university plus

their number of papers which they coauthored was considered as "total product" for that university.

RESULTS

Figure 1 shows that the total number of publications by the Iranian nephrologists as the first author was 384 over the past 10 years. Moreover, the overall number of publications by both nephrologists and nonnephrologists was 579 (average, 58 papers per year). An increasing trend in the number of publications from 1997 to 2007 was noted. Interestingly, 64.3% of all articles had been published within 4 years from 2003 to 2007.

Overall, 324 papers (56.0%) had been published in the peer-reviewed biomedical journals indexed by the Medline. Figure 2 shows the total number of publications in terms of nephrologists as the first or collaborating author (total products). The number of papers published by nephrologists was 228 in international journals and 156 in local journals. The number of papers published by nonnephrologists was 96 in international journals and 99 in local ones.

The majority of the papers were concerned with transplantation (58.3%), nephrology (20.0%), and hemodialysis (16.8%). Whereas, chronic ambulatory peritoneal dialysis (1.0%) and other topics (3.8%) were the subjects of a small proportion of the publications. Figure 3 demonstrates the number of publications in relation to the institutional affiliation of the first authors. The university hospitals were

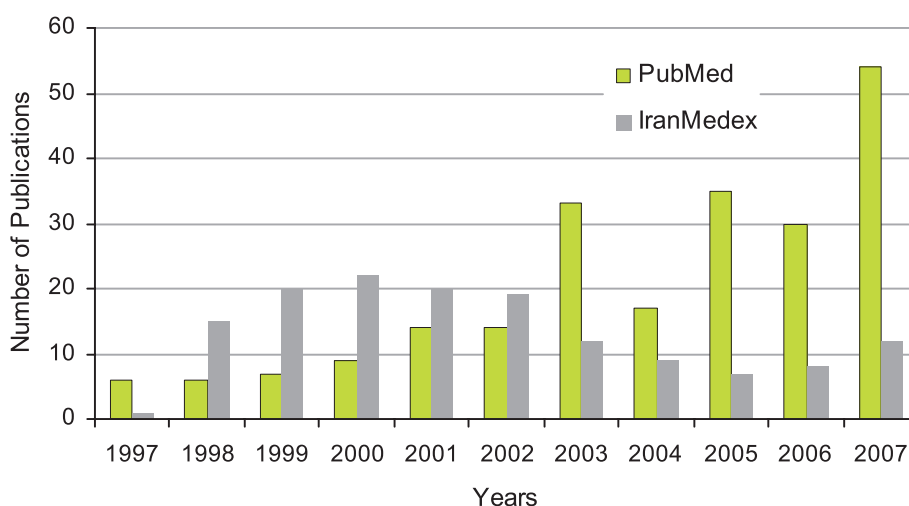


Figure 1. The number of articles published by the Iranian nephrologists is demonstrated as publications in the local journals (listed in the IranMedex) and Medline-indexed journals.

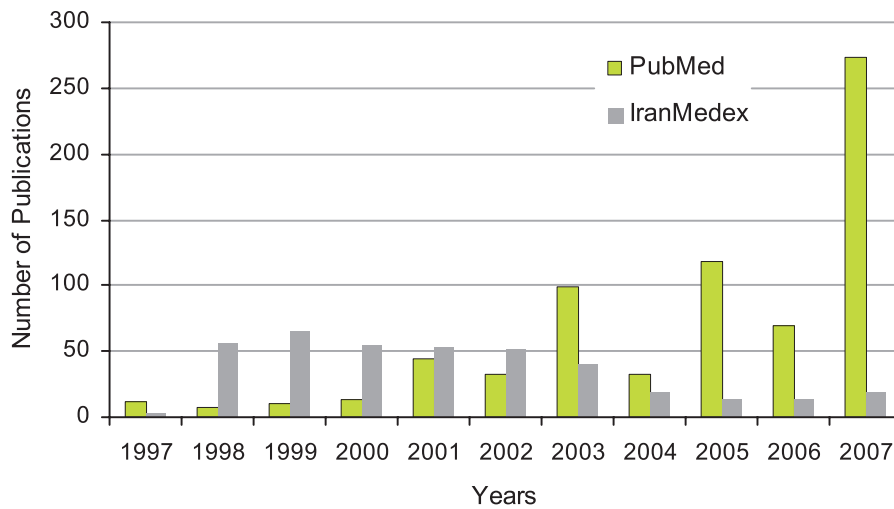


Figure 2. The total number of articles by the Iranian nephrologists either as the first or collaborating author is shown in the local journals (listed in the IranMedex) and Medline-indexed journals.

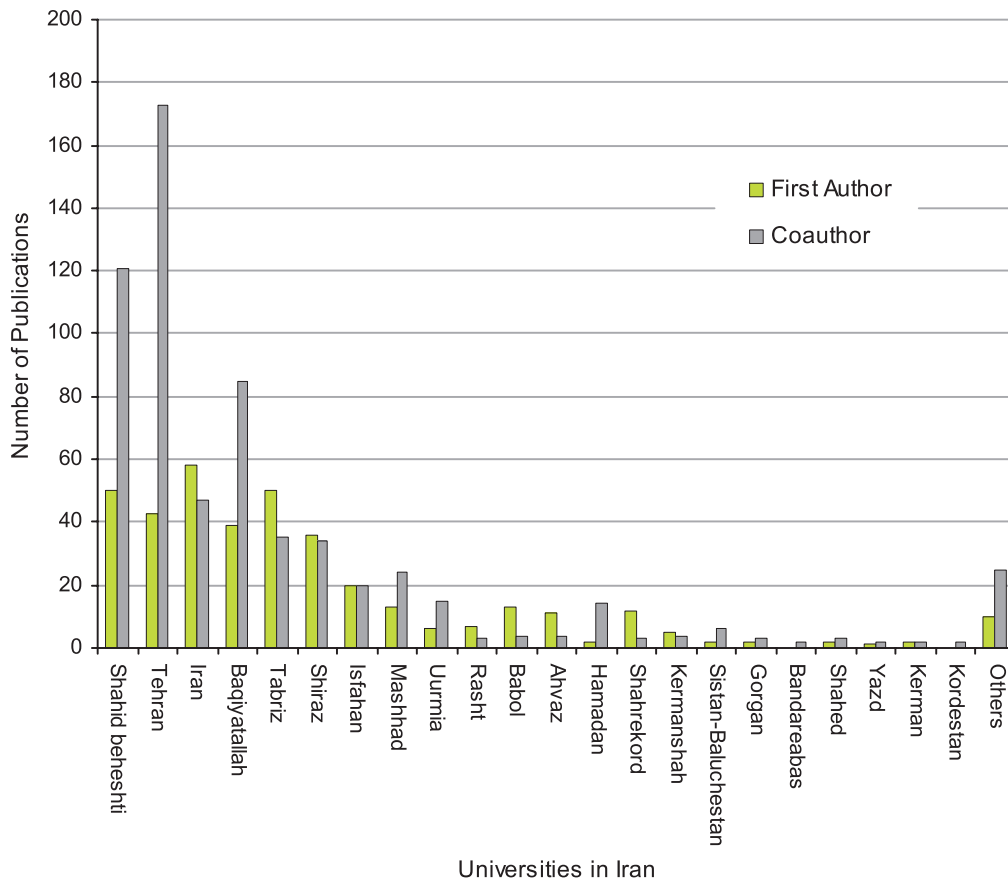


Figure 3. The number of papers published by the faculty members of the medical universities in Iran.

responsible for 98% of the publications, of which 23.2% were from Baqiyatallah and Imam Khomeini (Tabriz) hospitals. The next major contributors were from Namazi, Hasheminejad, and Imam Khomeini (Tehran) hospitals with 9.4%, 8.0%, and 7.8% of all

the publications, respectively. Most of the Iranian biomedical papers (according to the first authors) were originated from the capital city of Tehran (55.2%); particularly from Iran University (15.0%), Shaheed Beheshti University (13.0%), Tehran

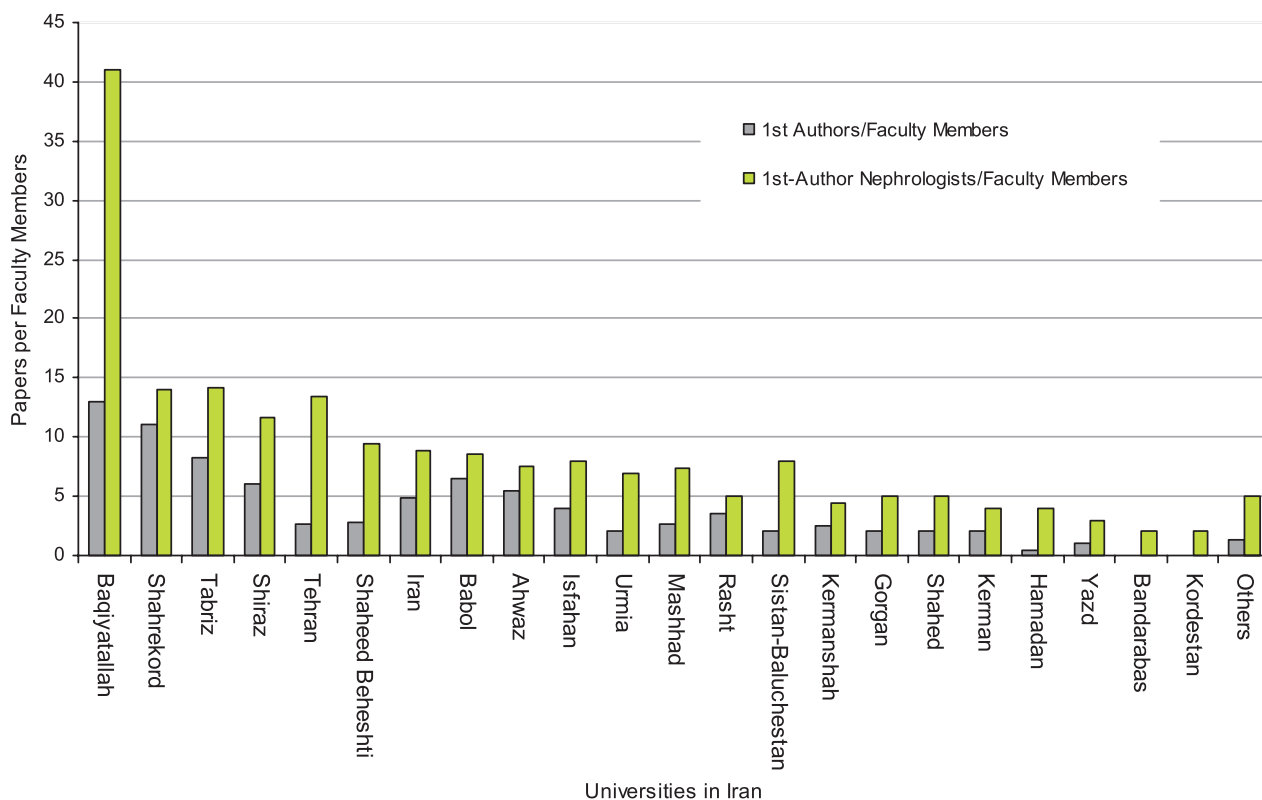


Figure 4. The proportion of the published papers from the medical universities of Iran to the number of faculty members.

University (11.2%), and Baqiyatallah University (10.2%). Figure 4 shows the number of publications per faculty member of each medical university.

Of all the publications traced in this study, 67.5% were retrospective articles. Clinical trials constituted 6.1% and case reports, 6.7% of the papers.

DISCUSSION

To our knowledge, this is the first study that evaluated the Iran’s research productivity in the field of kidney diseases. The first distinctive pattern in the Iranian scientific research output is its concentration in the capital city, Tehran, with more than half of all publications. In addition, large differences were found between the universities with respect to nephrology publications in the Medline and the IranMedex indexing systems (Figure 3). A more detailed analysis revealed an unexpectedly high nephrological publication output per nephrologists of smaller universities such as Baqiyatallah University of Medical Sciences with 13 publications per each faculty (Figure 4).

The number of publications derived from Medline-indexed journals is only a gross estimate of the proportion of Iran’s contribution to the field

of kidney disease and transplantation. Overall, 56% of the articles were published over the past 10 years in the internationally recognized Medline-indexed journals. The total number of nephrological publications was 579. An average of 58 papers per year appeared over the past decade with increasing number of papers over the years. In comparison, Al-Khader and colleagues reported that the total number of publications between 1992 and 2001 in the Kingdom of Saudi Arabia was 462 (average of 46.2 per year) with no major changes over the years. Half of the publications (238) had appeared in the Medline-indexed journals.⁴

Compared with the absolute number of publications, the quality of clinical research in this field is not satisfactory; our results suggested that the number of clinical trials (6.1%) were relatively small, while the majority of papers were retrospective articles (67.5%) and case reports (6.7%), enjoying inferior scientific value than prospective studies.⁵ Interestingly, authors are more likely to publish their prospective studies in the international journals than in the local journals. Case reports, though very important for the advancement of clinical science, are often quickly

written after a fortuitous encounter with a patient with rare disease, whereas randomized controlled trials or analytical epidemiological studies can be conducted only after elaborate preparation in terms of manpower and cost, and then, they take years to conduct.

We also observed a significant increase in the number of articles on nephrology over the years, 64.3% of all papers were published within the years 2003 to 2007. This growth has previously been reported in the total number of articles published by the Iranian scientists during the past decade.^{6,7} Aslani and colleagues showed that the total number of medical articles dealing with transplantation has increased from 1993 through 2003 in Iran.⁸ The majority of the papers in our study were also concerned with transplantation (58.3%). This increased number of transplantation-related articles is in line with progress in the country in the field of transplantation, in terms of increasing number of transplant centers and transplanted patients, which has made Iran the most active country in the field of transplantation in the Middle East Society for Organ Transplantation region.⁹ The increased number of published articles in the field of kidney disease research is mainly attributed to the number of kidney transplant patients (almost 21 352 recipients up to 2006) and transplantation centers (25 centers) as well as to an increase in the number of articles published in some of the journals in the field. Kidney transplant activity in Iran has reached 26.5 kidney transplants per million per year, in 2006.¹⁰ Of note, the annual rate of kidney transplantation in Iran is 1800 to 1900, being the highest among Middle Eastern countries.¹⁰ Therefore, Iran's contribution to research on transplantation in the region is satisfactory and the time trend in the past decade was upward.

The author believes that the following strategies would help boost the amount of high-quality clinical research in Iran. First, clinical research divisions with support staff of either biostatistician and/or clinical epidemiologist should be set up in academic hospitals. Second, sufficient funds should be directed to clinical departments for conducting patient-oriented research into kidney disease. Finally, appropriate research methodology should be taught to medical students, residents, and postgraduate students through a well-designed curriculum. Clinical research should be encouraged

at all levels in Iran, but not at the cost of basic research. However, for Iran to contribute more to the current world of evidence-based medicine, the infrastructure for clinical research must be improved to produce high-quality evidence-based randomized controlled trials and well-designed clinical epidemiological studies. The overall objectives of this promotion would be to increase the quality and quantity of clinical research in Iran to that of other Middle Eastern countries.

We used the PubMed, which is an easily accessible and widely used database. Nevertheless, some scientific articles are not included in this database, and consequently, were not analyzed in our study. It should be also emphasized that, in the PubMed, only the address of the first author is presented; thus, the fact that a study may be the result of a multicenter cooperation is not taken into account. We also neglected papers by nonnephrologist authors in the field of kidney disease in which no nephrologists shared. Therefore, our conclusions might change with further analyses of the literature.

CONCLUSIONS

Iran's contribution to the research on kidney disease is not satisfactory in terms of the volume and quality of publications. On the other hand, the data suggested that there was a significant research activity in the field of kidney transplantation over the studied period. Although we can claim that Iran is the leading of the Middle Eastern countries in nephrological research, much improvement is still required especially regarding the quality of research.

CONFLICT OF INTEREST

None declared.

REFERENCES

1. Malekzadeh R, Mokri A, Azarmina P. Medical science and research in Iran. *Arch Iran Med*. 2001;1:27-39.
2. Petrak J. [Bibliometric indicators in evaluation of research activity. 1. Publishing and evaluation of research]. *Lijec Vjesn*. 2001;123:77-81.
3. IranMedex. Available from: <http://www.iranmedex.com>.
4. Al-Khader AA, Al-Jondeby MS, Shaheen FA. Impact of Nephrology publications from Saudi Arabia in the last decade. *Saudi Med J*. 2002;23:1177-80.
5. Weisinger JR, Bellorin-Font E. Latin American nephrology: scientific production and impact of the publications. *Kidney Int*. 1999;56:1584-90.

6. Azizi F, Etemadi A, Hajipoor R, Mortazavi N. Trends of publication in medical journals in Iran in the 1990s. *Saudi Med J*. 2004;25:s34.
7. Stone R. Science in Iran. An Islamic science revolution? *Science*. 2005;309:1802-4.
8. Aslani J, Khedmat H, Assari S, et al. Transplantation research in Iran: a bibliometric study. *Transplant Proc*. 2007;39:788-9.
9. Masri MA, Haberal MA, Shaheen FA, et al. Middle East Society for Organ Transplantation (MESOT) Transplant Registry. *Exp Clin Transplant*. 2004;2:217-20.
10. Mahdavi-Mazdeh M, Heidary Rouchi A, Norouzi S, Aghighi M, Rajolani H, Ahrabi S. Renal replacement therapy in Iran. *Urol J*. 2007;4:66-70.

Correspondence to:
Behzad Einollahi, MD
Nephrology and Urology Research Center, Baqiyatallah Hospital,
Vanak Sq, Tehran, Iran
Tel: +98 21 8803 7667
Fax: +98 21 8803 7673
E-mail: einollahi@bmsu.ac.ir

Received August 2007
Revised September 2007
Accepted September 2007