RESEARCH ARTICLE

Top 100 Cited Articles on Peritoneal Dialysis: A Bibliometric Analysis

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Abstract:

Background: The purpose of this study is to broaden the understanding of peritoneal dialysis by presenting the most-cited articles pertaining to this subject.

Methods: We searched articles on the Web of Science and selected 100 articles according to the frequency of citations. Next, we reviewed the contents of the articles and identified the characteristics of these articles.

Results: There are 21 journals in which the top-100 cited articles were published. The names of the journals, in the order in which the articles are cited, are as follows: Kidney International (25 articles), Nephrology Dialysis Transplantation (13 articles), and Journal of the American Society of Nephrology (12 articles). The top 100-cited articles were published in 15 countries. The country with the greatest number of publications was the United States of America (19 articles). The institution with the greatest number of articles (7 articles) was the University Health Network of Toronto. The author who wrote the most number of articles (5 articles) was Davies SJ.

Conclusion: This study is the first in the field of nephrology to provide a list of the top-100 cited articles dedicated to peritoneal dialysis. Through this study, the research trends and major academic interests pertaining to peritoneal dialysis would be identified.

Keywords: Publications, Peritoneal dialysis, Analysis, End-stage renal growth (ESRD), Science Citation Index (SCI), Citation analysis.

1. INTRODUCTION

End-stage renal growth (ESRD) is a condition in which the renal function is terminated, and dialysis is required. Since the prescription of dialysis to patients with chronic kidney disease is subjective, ESRD is defined as an advanced stage of chronic kidney disease with a glomerular filtration rate of less than 15 mL/min/1.73 m² or as symptomatic uremia that requires dialysis [1]. ESRD is recognized as a major global health problem. The prevalence of ESRD is increasing, both globally and in Korea [2, 3]. Patients with ESRD may often suffer from various complications due to multi-organ dysfunction. In ESRD, two forms of renal replacement therapy may be used: peritoneal dialysis (PD) and hemodialysis (HD). As PD and HD, both have advantages and disadvantages over the other, the selection of the appropriate modality can be determined by the patient's preference, age, or other co-morbidities. Due to the technological innovation of peritoneal dialysis, treatment-related complications have been reduced. This has resulted in the increased use of PD as the long-term treatment of ESRD [4].

The Science Citation Index (SCI) was used to select journals with high academic contributions. The SCI was introduced in 1964 by the Institute for Scientific Information (ISI). It was also necessary for building indexes and collecting citation information for database screening of scientific journals. The SCI has become one of the most frequently and widely used databases for evaluating research performances and retrieving literature. In the field of science, as the number

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of articles increased, there was a corresponding increase in the limitation of providing these articles in the form of books and compact discs. This led to the development of a larger Web version known as the Science Citation Index Expanded in the Web of Science. The number of citations reflects the interest of the academic community. Reviewing frequently-cited articles can provide information on key areas and the areas of substantial growth in the specific field.

As the high number of citations is an indicator of high impact in the academic community, most-cited articles are especially important. The most-cited articles provide interesting insights on how topics, authors, and articles affect the field of study over time. Several studies have previously conducted analyses on highly-cited papers in various fields. These fields include anesthesiology, general surgery, plastic surgery, orthopedic surgery, dermatology, emergency medicine, obstetrics and gynecology, headache disorders, and critical-care medicine [5 - 13]. However, no previous study has analyzed the top-100 cited articles on PD.

The purpose of this study is to broaden the understanding of peritoneal dialysis by presenting the most-cited articles pertaining to it.

2. MATERIALS AND METHODS

We performed a citation analysis of PD. The study was conducted in the following manner.

First, we searched for articles only related to peritoneal dialysis by excluding those that involved HD. We searched on the Web of Science (https://apps.webofknowledge.com) by limiting the document type to journal articles and reviews. The publication time was set from 1969 to 2019, a total of 50 years. Articles that fit these criteria were sorted based on the citation count.

Second, we selected 100 articles related to PD according to citation frequency. Then, we reviewed the contents of each article and organized these according to the number of citations, article title, publishing journal, topic categories, year of publication, and authorship. The topic categories were subtyped as mortality and survival, peritoneal membrane characteristics, presence of peritonitis, epidemiology, and pathophysiology. When there was more than one author, the first author was used as the criterion. Recommendations were excluded. No statistical technique was used. The data were presented using descriptive statistics.

3. RESULTS

A total of 10,803 PD-related articles were reviewed. We selected 100 articles and ranked them from the highest to the lowest number of citations (Table 1). The most-cited article was cited 565 times. The top 20 articles were cited over 230 times.

Table 1. The top 100 cited articles about peritoneal dialysis.

| Rank | Journal                        | Title                                                                 | Number of citation |
|------|--------------------------------|----------------------------------------------------------------------|--------------------|
| 1    | Journal of the American Society of Nephrology | Relative contribution of residual renal function and peritoneal clearance to adequacy of dialysis: A reanalysis of the CANUSA study | 600                |
| 2    | New England Journal of Medicine | Peritoneal dialysis and epithelial-to-mesenchymal transition of mesothelial cells | 518                |
| 3    | Annals of Internal Medicine    | Continuous ambulatory peritoneal-dialysis                            | 503                |
| 4    | Journal of the American Society of Nephrology | Increased peritoneal membrane transport is associated with decreased patient and technique survival for continuous peritoneal dialysis patients | 436                |
| 5    | Annals of Internal Medicine    | Peritonitis during continuous ambulatory peritoneal-dialysis         | 348                |
| 6    | Nephrology Dialysis Transplantation | Longitudinal changes in peritoneal kinetics: The effects of peritoneal dialysis and peritonitis | 308                |
| 7    | Journal of the American Society of Nephrology | Cardiac valve calcification as an important predictor for all-cause mortality and cardiovascular mortality in long-term peritoneal dialysis patients: A prospective study | 304                |
| 8    | Kidney International           | Effect of fluid and sodium removal on mortality in peritoneal dialysis patients | 304                |
| 9    | Peritoneal Dialysis International | Pathogenesis of peritoneal fibrosing syndromes (sclerosing peritonitis) in peritoneal-dialysis | 300                |
| 10   | Kidney International           | The Euro-Balance Trial: The effect of a new biocompatible peritoneal dialysis fluid (balance) on the peritoneal membrane | 296                |
| 11   | Journal of the American Society of Nephrology | Peritoneal glucose exposure and changes in membrane solute transport with time on peritoneal dialysis | 291                |
| 12   | Journal of the American Society of Nephrology | Global trends in rates of peritoneal dialysis | 260                |
| 13   | New England Journal of Medicine | Staphylococcus-aureus nasal carriage and infection in patients on continuous ambulatory peritoneal-dialysis | 260                |
| 14   | Peritoneal Dialysis International | Vascular and interstitial changes in the peritoneum of CAPD patients with peritoneal sclerosis | 259                |
| 15   | Kidney International           | A randomized multicenter clinical-trial comparing isomolar icodestrin with hyperosmolar glucose solutions in CAPD | 254                |
| 16   | Kidney International           | Protein losses during peritoneal-dialysis                            | 252                |
| 17   | Nephrology Dialysis Transplantation | Associations of serum fetuin-A with malnutrition, inflammation, atherosclerosis and valvular calcification syndrome and outcome in peritoneal dialysis patients | 247                |
| 18   | Nephrology Dialysis Transplantation | Sclerosing peritonitis: the experience in Australia                  | 246                |
| Rank | Journal                                      | Title                                                                 | Number of citation |
|------|----------------------------------------------|----------------------------------------------------------------------|-------------------|
| 19   | Transactions American Society for Artificial Internal Organs | Simple and safe technique for continuous ambulatory peritoneal-dialysis (CAPD) | 241               |
| 20   | American Journal of Kidney Diseases          | The relative importance of residual renal function compared with peritoneal clearance for patient survival and quality of life: An analysis of the Netherlands Cooperative Study on the Adequacy of Dialysis (NECOSAD)-2 | 231               |
| 21   | Infection and Immunity                       | Effects of the composition of peritoneal-dialysis fluid on chemi-luminescence, phagocytosis and bactericidal activity in vitro | 229               |
| 22   | Archives of Internal Medicine                | Sclerotic thickening of the peritoneal membrane in maintenance peritoneal-dialysis patients | 228               |
| 23   | American Journal of Kidney Diseases          | Encapsulating peritoneal sclerosis in Japan: A prospective, controlled, multicenter study | 222               |
| 24   | American Journal of Kidney Diseases          | Functional longevity of the human peritoneum – How long is continuous peritoneum dialysis possible – Results of a prospective medium long term study | 211               |
| 25   | Kidney International                         | Metabolic balance studies and dietary-protein requirements in patients undergoing continuous ambulatory peritoneal-dialysis | 209               |
| 26   | Peritoneal Dialysis International            | Peritoneal catheters and exit-site practices toward optimum peritoneal access: 1998 update (Official report from the international society for peritoneal dialysis) | 201               |
| 27   | Annals of Internal Medicine                  | Effects of an angiotensin-converting renal function in patients receiving enzyme inhibitor on residual peritoneal dialysis - A randomized, controlled study | 200               |
| 28   | Kidney International                         | Long-term clinical effects of a peritoneal dialysis fluid with less glucose degradation products | 199               |
| 29   | Journal of the American Society of Nephrology | Inflammation, residual kidney function, and cardiac hypertrophy are interrelated and combine adversely to enhance mortality and cardiovascular death risk of peritoneal dialysis patients | 197               |
| 30   | Peritoneal Dialysis International            | ISPD position statement on reducing the risks of peritoneal dialysis-related infections | 187               |
| 31   | Journal of the American Society of Nephrology | Meta-analysis: Peritoneal membrane transport, mortality, and technique failure in peritoneal dialysis | 187               |
| 32   | Kidney International                         | Glucose-absorption during continuous ambulatory peritoneal-dialysis | 185               |
| 33   | Nephrology Dialysis Transplantation          | Peritoneal solute transport predicts survival on CAPD independently of residual renal function | 181               |
| 34   | Nephron                                      | Morphological changes in the peritoneal vasculature of patients on CAPD with ultrafiltration failure | 180               |
| 35   | Journal of the American Society of Nephrology | Vascular proliferation and enhanced expression of endothelial nitric oxide synthase in human peritoneum exposed to long-term peritoneal dialysis | 171               |
| 36   | Journal of the American Society of Nephrology | Randomized, double-blind trial of antibiotic exit site cream for prevention of exit site infection in peritoneal dialysis patients | 165               |
| 37   | American Journal of Kidney Diseases          | Sclerosing encapsulating peritonitis in patients undergoing continuous ambulatory peritoneal dialysis: A report of the Japanese Sclerosing Encapsulating Peritonitis Study Group | 163               |
| 38   | Kidney International                         | Albumin homeostasis in patients undergoing continuous ambulatory peritoneal-dialysis | 163               |
| 39   | American Journal of Kidney Diseases          | Strict volume control normalizes hypertension in peritoneal dialysis patients | 162               |
| 40   | Journal of the American Society of Nephrology | Measurement of residual renal function in patients treated with continuous ambulatory peritoneal dialysis | 161               |
| 41   | Journal of Laboratory and Clinical Medicine  | Growth factors VEGF and TGF-beta 1 in peritoneal dialysis | 160               |
| 42   | Kidney International                         | A longitudinal, 5 year survey of urea kinetic-parameters in CAPD patients | 160               |
| 43   | Lancet                                       | Prospective controlled trial of a y-connector and disinfectant to prevent peritonitis in continuous ambulatory peritoneal-dialysis | 160               |
| 44   | Nephron                                      | Morphology of the peritoneal membrane during continuous ambulatory peritoneal-dialysis | 159               |
| 45   | American Journal of Kidney Diseases          | Peritoneoscopic versus surgical placement of peritoneal dialysis catheters: A prospective randomized study on outcome | 156               |
| 46   | Kidney International                         | Mortality and technique failure in patients starting chronic peritoneal dialysis: Results of the Netherlands cooperative study on the adequacy of dialysis | 154               |
| 47   | Peritoneal Dialysis International            | Heat sterilization of fluids for peritoneal-dialysis gives rise to aldehydes | 154               |
| 48   | American Journal of Kidney Diseases          | Mesenchymal conversion of mesothelial cells as a mechanism responsible for high solute transport rate in peritoneal dialysis: Role of vascular endothelial growth factor | 151               |
| 49   | Kidney International                         | Longitudinal relationship between solute transport and ultrafiltration capacity in peritoneal dialysis patients | 149               |
| 50   | Nephrology Dialysis Transplantation          | Plasma and dialysate IL-6 and VEGF concentrations are associated with high peritoneal solute transport rate | 149               |
| 51   | Journal of Clinical Endocrinology & Metabolism | Circulating Fibroblast Growth Factor 23 in Patients with End-Stage Renal Disease Treated by Peritoneal Dialysis Is Intact and Biologically Active | 147               |
| Rank | Journal                                | Title                                                                                                                                  | Number of citation |
|------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 52   | New England Journal of Medicine        | Continuous ambulatory peritoneal-dialysis in diabetics with end-stage renal-disease                                                  | 147                |
| 53   | American Journal of Kidney Diseases    | Analysis of microbiological trends in peritoneal dialysis-related peritonitis from 1991 to 1998                                       | 146                |
| 54   | Kidney International                    | Long-term exposure to new peritoneal dialysis solutions: Effects on the peritoneal membrane                                         | 144                |
| 55   | Lancet                                 | Pharmacokinetics of recombinant human erythropoietin in patients on continuous ambulatory peritoneal-dialysis                      | 144                |
| 56   | Plos One                               | Fluid Status in Peritoneal Dialysis Patients: The European Body Composition Monitoring (EuroBCM) Study Cohort                       | 141                |
| 57   | Kidney International                    | Outcomes of single organism peritonitis in peritoneal dialysis: Gram negatives versus gram positives in the Network 9 Peritonitis Study | 141                |
| 58   | Nephron                                | Permanent loss of ultrafiltration capacity of the peritoneum in long-term peritoneal-dialysis – an epidemiological study       | 140                |
| 59   | Kidney International                    | Role of an improvement in acid-base status and nutrition in CAPD patients                                                              | 139                |
| 60   | American Journal of Kidney Diseases    | Risk factors for peritonitis in long-term peritoneal dialysis: The Network 9 peritonitis and catheter survival studies           | 136                |
| 61   | Kidney International                    | A quantitative description of solute and fluid transport during peritoneal-dialysis                                                  | 136                |
| 62   | Lancet                                 | Peritonitis in continuous ambulatory peritoneal-dialysis – laboratory and clinical studies                                             | 136                |
| 63   | Nephrology Dialysis Transplantation    | Aqueous solute concentrations and evaluation of mass-transport coefficients in peritoneal-dialysis                                 | 134                |
| 64   | Kidney International                    | High volume, low-frequency continuous ambulatory peritoneal-dialysis                                                                 | 134                |
| 65   | Journal of the American Society of Nephrology | Higher peritoneal transport status is associated with higher mortality and technique failure in the Australian and New Zealand peritoneal dialysis patient populations | 133                |
| 66   | Nephrology Dialysis Transplantation    | Association between inflammation and changes in residual renal function and peritoneal transport rate during the first year of dialysis | 133                |
| 67   | Nephrology Dialysis Transplantation    | Long-term blood pressure control in a cohort of peritoneal dialysis patients and its association with residual renal function     | 133                |
| 68   | Kidney International                    | Bicarbonate/lactate-based peritoneal dialysis solution increases cancer antigen 125 and decreases hyaluronic acid levels            | 133                |
| 69   | Kidney International                    | Peritoneal transport characteristics with glucose polymer based dialysate                                                             | 132                |
| 70   | Journal of Clinical Microbiology       | Examination of the morphology of bacteria adhering to peritoneal-dialysis catheters by scanning and transmission electron-microscopy | 132                |
| 71   | Kidney International                    | Toxicity of peritoneal-dialysis fluids on cultured fibroblasts, L-929                                                                  | 131                |
| 72   | Journal of Infectious Diseases         | Peritonitis due to a mycobacterium-chelonei-like organism associated with intermittent chronic peritoneal-dialysis                  | 130                |
| 73   | Kidney International                    | Longitudinal membrane function in functionally anuric patients treated with APD: Data from EAOSS on the effects of glucose and icodextrin prescription | 127                |
| 74   | Kidney International                    | Glucose degradation products in PD fluids: Do they disappear from the peritoneal cavity and enter the systemic circulation?       | 127                |
| 75   | Peritoneal Dialysis International       | Decrease in Staphylococcus aureus exit-site infections and peritonitis in CAPD patients by local application of mupirocin ointment at the catheter exit site | 127                |
| 76   | Journal of Infectious Diseases         | Peritoneal-macrophages and opsonins – anti-bacterial defense in patients undergoing chronic peritoneal-dialysis                     | 127                |
| 77   | American Journal of Kidney Diseases    | Changes of cytokine profiles during peritonitis in patients on continuous ambulatory peritoneal dialysis                              | 126                |
| 78   | Kidney International                    | How much peritoneal dialysis is required for the maintenance of a good nutritional state?                                           | 126                |
| 79   | Nephrology Dialysis Transplantation    | Clinical biocompatibility of a neutral peritoneal dialysis solution with minimal glucose-degradation products - A 1-year randomized control trial | 125                |
| 80   | Nephrology Dialysis Transplantation    | Broadening Options for Long-term Dialysis in the Elderly (BOLDE): differences in quality of life on peritoneal dialysis compared to haemodialysis for older patients | 124                |
| 81   | Nephrology Dialysis Transplantation    | Association between residual renal function inflammation and patient survival in new peritoneal dialysis patients                  | 124                |
| 82   | Journal of Clinical Investigation      | Altered permeability of peritoneal membrane after using hypertonic peritoneal dialysis fluid                                        | 124                |
| 83   | Journal of Clinical Endocrinology & Metabolism | Relationship between Plasma Fibroblast Growth Factor-23 Concentration and Bone Mineralization in Children with Renal Failure on Peritoneal Dialysis | 123                |
| 84   | Kidney International                    | Analysis of peritoneal-macrophages in continuous peritoneal-dialysis patients                                                          | 122                |
| 85   | Journal of the American Society of Nephrology | Effects of Biocompatible versus Standard Fluid on Peritoneal Dialysis Outcomes                                                                 | 121                |
There are 21 journals in which the top-100 cited articles were published. The names of the journals, in the order in which the articles are cited, are as follows: Kidney International (26 articles), Nephrology Dialysis Transplantation (13 articles), and Journal of the American Society of Nephrology (12 articles). Nearly half of the articles have been published in these three journals (51 articles) (Table 2).

Table 2. Journals with two or more of the top-100 cited articles on peritoneal dialysis.

| Rank | Journal                                      | Number of articles |
|------|----------------------------------------------|-------------------|
| 1    | Kidney International                         | 26                |
| 2    | Nephrology Dialysis Transplantation          | 13                |
| 3    | Journal of the American Society of Nephrology| 12                |
| 4    | American Journal of Kidney Disease           | 11                |
| 5    | Peritoneal Dialysis International             | 11                |
| 6    | Lancet                                       | 4                 |
| 7    | Nephron                                      | 4                 |
| 8    | Annals of Internal Medicine                  | 3                 |
| 9    | New England Journal of Medicine              | 3                 |
| 10   | Journal of Clinical Endocrinology Metabolism  | 2                 |
| 11   | Journal of Infectious Diseases               | 2                 |

The top-100 cited articles have been published in 15 countries. The country with the greatest number of publications was the United States of America (19 articles). The other countries were the United Kingdom (18 articles), Canada (13 articles), Sweden (9 articles), and the Netherlands (8 articles) (Table 3).
Table 3. Countries with three or more of the top-100 cited articles on peritoneal dialysis.

| Rank | Country                  | Number of articles |
|------|--------------------------|--------------------|
| 1    | United States of America | 19                 |
| 2    | United Kingdom           | 18                 |
| 3    | Canada                   | 13                 |
| 4    | Sweden                   | 9                  |
| 5    | Netherlands              | 8                  |
| 6    | Hong Kong                | 6                  |
| 7    | Belgium                  | 5                  |
| 8    | Australia                | 3                  |
| 9    | Italy                    | 3                  |
| 10   | Japan                    | 3                  |
| 11   | Spain                    | 3                  |

Fig. (1). Number of top-100 cited articles on peritoneal dialysis according to decade.

Fig. (1) summarizes the publication decades of the top-100 cited articles. Forty-five articles have been published since 2000. The earliest was published in 1969, while the most recent one was published in 2013.

Eight institutions provided more than three of the top-100 cited articles (Table 4). Counting was based on the first author’s name for articles with multiple authors. The institution that published the greatest number of articles was the University Health Network of Toronto (7 articles), followed by The Chinese University of Hong Kong (6 articles) and the University of Amsterdam (6 articles).

Table 4. Institutions of the first author’s origin which have three or more of the top-100 cited articles on peritoneal dialysis.

| Rank | Institution                                           | Number of articles |
|------|-------------------------------------------------------|--------------------|
| 1    | University Health Network Toronto, Canada             | 7                  |
| 2    | Chinese University of Hong Kong, People’s Republic of China | 6                  |
| 3    | University of Amsterdam, Netherlands                  | 6                  |
| 4    | University Hospital of North Staffordshire, United Kingdom | 5                  |
| 5    | Cardiff University, United Kingdom                    | 4                  |
| 6    | Karolinska University Hospital, Sweden                | 4                  |
| 7    | St. Joseph’s Healthcare Hamilton, Canada              | 3                  |
| 8    | Ghent University, Belgium                             | 3                  |
Table 5. First authors with two or more of the top-100 cited articles on peritoneal dialysis

| Rank | First author      | Number of articles |
|------|-------------------|--------------------|
| 1    | Davies SJ         | 5                  |
| 2    | Blumenkrantz MJ   | 3                  |
| 3    | Wang AY           | 3                  |
| 4    | Chung SH          | 2                  |
| 5    | Gokal R           | 2                  |
| 6    | Mistry CD         | 2                  |
| 7    | Rippe B           | 2                  |

Table 5 lists the top-ranked authors who had three or more published PD articles. The author who wrote the most number of articles was Davies, SJ (5 articles).

4. DISCUSSION

This study identified the top-100 cited articles for PD. These articles provided interesting insights into scientific advances and perspectives in the field of PD using the ISI database.

The most-cited article was published in 2010 by the Journal of the American Society of Nephrology and was authored by Bargman JM [14]. Previous CANUSA data showed that clearance of small solutes like creatinine and urea was associated with patient survival. The solute clearances could be divided into either peritoneal or renal clearance. This article analyzed the peritoneal and renal clearances separately in terms of the CANUSA data. The results showed that the contribution of residual renal function is more important than peritoneal clearance.

The second most frequently-cited article was titled “Peritoneal dialysis and epithelial-to-mesenchymal transition of mesothelial cells” [15]. This article was cited 518 times. It was authored by Yáñez-Mó, M in 2005 and published in the New England Journal of Medicine. The article stated that mesothelial cells undergoing epithelial-to-mesenchymal transition may change the pathophysiology of ultrafiltration failure. For patients undergoing PD, markers related to mesothelial cells such as snail, E-cadherin, and α2 integrin may be useful markers for follow-up.

The earliest paper on PD is “A simple and safe technique for continuous ambulatory peritoneal dialysis(CAPD)” [16]. This article was published in April 1978 in the Transactions American Society for Artificial Internal Organs. It reports the experience of performing CAPD using plastic dialysis bags instead of intermittent peritoneal dialysis using glass dialysate containers in 28 patients. This technique is safer because peritonitis was reduced. It was more suitable for chronic dialysis by making dialysis available at home. Since this paper, a large number of articles related to the benefits of CAPD have been published, and CAPD patients have increased.

The most interesting topic was under the umbrella of pathophysiology (28 articles). The articles under this topic covered laboratory changes during PD, changes in metabolism, and changes in residual renal function. The second most interesting topic was about the PD membrane (20 articles). The article with the greatest number of citations related to PD patient physiology was authored by Michael, J in 1981 and published in Kidney International [17]. The article discussed protein losses during PD. It stated that there was no significant difference in the patient’s weekly protein loss on intermittent maintenance PD and continuous ambulatory PD. Rather, protein loss was increased in patients who developed peritonitis. According to the results of this study, the dialysate protein losses did not limit the usefulness of PD.

We found some interesting trends among the article topics as these have changed over time. First, the most frequent subject was pathophysiology. This was consistent with the results of the analyses in other fields [5, 6, 8, 13]. Other topics often mentioned in many articles were basic research, treatment, and pathophysiology. Second, more articles were being published as time passed from the 1980s, 1990s, to the 2000s. Throughout the 1990s to 2000s, sixty-nine of the top-100 cited articles were published. Physiology articles were evenly published in each decade, but these articles were most common during the 2000s. This is probably due to the increase in the number of patients undergoing PD [18] and the possibility of increased large-scale researches launched. The second most interesting topic, the PD membrane, was published mainly in the 1980s. This trend is presumed to be due to the high initial interest in the role of membranes in PD. The differences among patients were revealed after the initiation of peritoneal dialysis.

Nineteen articles originated from the United States, while eighteen articles were published from the United Kingdom. Other fields also have the largest number of articles that came from the United States [5 - 8, 10 - 13]. There are a total of 9 top 100 cited articles published in Asia. Today, Asia is facing a strategic test to catch up with the West in several fields of research. As the access to data improves and large-scale research becomes possible in Asia, it is expected that many papers with a high level of evidence will be published. Accordingly, the number of citations and contributions will increase. We found that none of the top-100 cited articles came from South America or Africa. This could be related to the difficulties in access to information, research, publishing, and language barriers in these areas.

Kidney International was the most frequently cited journal (25 articles), followed by Nephrology Dialysis Transplantation (13 articles). More articles have been published in General Nephrology Journals, not specific PD journals such as Peritoneal Dialysis International. The reason can be estimated as follows. First, Peritoneal Dialysis International began publishing in June 1980. Second, it deals with a
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