

## ОБЗОРЫ И РЕЦЕНЗИИ

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## Systematic review of the articles devoted to hip and knee arthroplasty and published in Korean, Russian and Ukrainian journals over the 2005–2014 years

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*The aim: to identify the peculiarities of the study and publications concerning the hip and knee arthroplasty in the articles that were published in the major Korean, Russian and Ukraine orthopedic journals over the last decade. Methods: the authors studied 615 Korean and 361 Russian articles that were published Korean, Russian and Ukrainian journals («Clinics in Orthopedic Surgery», «Journal of the Korean Orthopaedic Association», «The Journal Hip & Pelvis», «The Journal Knee Surgery & Related Research», «Traumatology and orthopedics of Russia», «Reporter of Traumatology and Orthopedics named Priorov», «Genij Ortopedii», «Orthopaedics, Traumatology and Prosthetics») from 2005 to 2014 years. The articles were divided into three groups: 1<sup>st</sup> — hip arthroplasty, 2<sup>nd</sup> — knee arthroplasty, 3<sup>rd</sup> — the articles devoted to the general issues concerning both of theme. Statistical analysis was performed with SPSS software for Windows (version 20.0, SPSS Inc., Chicago, IL). Results: the authors revealed that among 615 Korean articles 305 papers (49.6 %) concerned hip arthroplasty, 288 (46.8 %) — knee arthroplasty and 22 (3.6 %) covered both topics or were based on the common questions of arthroplasty. The number of article surveying both hip and knee joints or the general problems of the arthroplasty were equal to 50 articles (13.8 %), hip arthroplasty — 235 articles (65%), knee arthroplasty — 76 articles (21.2 %) among of 361 articles in Russian database. There are some versatile features of studies depending upon the region. Implant and arthroplasty equipment peculiarities were mainly studied in the articles published in Russian journals, while the revision problems were fundamentally studied in the articles published in Korean journals. Conclusions: the differences in the research topic and versatile features of hip and knee arthroplasty depending upon the country (Korea or Russia) were revealed. The accurate definition of the etiopathogenetic indications for hip and knee arthroplasty can provide better functional outcomes of surgical treatment and require further investigation. Key words: hip arthroplasty, knee arthroplasty, publication features.*

*Цель: определить особенности исследований, посвященных эндопротезированию тазобедренного и коленного суставов, результаты которых опубликованы в ведущих корейских, российских и украинского ортопедических журналах на протяжении последних 10 лет. Методы: проанализировано 615 статей на корейском языке и 361 на русском, опубликованных в «Clinics in Orthopedic Surgery», «Journal of the Korean Orthopaedic Association», «The Journal Hip & Pelvis», «The Journal Knee Surgery & Related Research», «Травматология и ортопедия России», «Вестник травматологии и ортопедии им. Н. Н. Приорова», «Гений ортопедии», «Ортопедия, травматология и протезирование» (Украина) в период с 2005 по 2014 гг. Статьи разделены на 3 группы: I — посвящены эндопротезированию тазобедренного сустава, II — коленного, III — различным общим вопросам обеих тем. Статистический анализ выполнен с использованием программного обеспечения для Windows (версия 20.0, SPSS Inc., Chicago, IL). Результаты: выявлено, что среди корейских статей 305 работ (49,6 %) были посвящены эндопротезированию тазобедренного сустава, 288 (46,8 %) — коленного, 22 (3,6 %) затрагивали обе тематики и общие вопросы эндопротезирования. Среди статей из русской базы данных эндопротезированию тазобедренного сустава было посвящено 235 работ (65 %), коленного — 76 (21,2 %), обоих суставов и общим вопросам эндопротезирования — 50 (13,8 %). Выявлены характерные особенности исследований в зависимости от региона, где их проводили. Установлено, что изучению особенностей имплантатов и технике выполнения эндопротезирования посвящены в основном статьи, опубликованные в российских журналах. Проблемы ревизионного эндопротезирования более фундаментально представлены в работах корейских специалистов. Выводы: выявлены различия в направлении исследований, касающихся эндопротезирования коленного и тазобедренного суставов. Четкое определение этиопатогенетических показаний для выполнения указанных операций может обеспечить лучший функциональный результат хирургического лечения и требует дальнейшего изучения. Ключевые слова: эндопротезирование тазобедренного сустава, эндопротезирование коленного сустава, особенности публикаций.*

**Key words:** hip arthroplasty, knee arthroplasty, publication features

## Introduction

Total hip replacement (THR) and total knee replacement (TKR) are widely used to treat diseased and damaged joints. Only in United States, almost 300,000 THA surgeries and 500,000 TKA surgeries are performed annually. This number is supposed to rise to 572,000 annual THA surgeries and 3.5 million annual TKA surgeries approximately by 2030 [1, 2]. In spite of the widespread introduction of new technology, many questions of the hip and knee arthroplasty remains unresolved and it makes our study versatile to deal with this complex problem [3, 4].

The maintenance of scientific funding has long been a luxury that only developed countries have been able to afford, and so it can be inferred that the contribution of a country towards the global research community is a symbol of its international technological status. As developing countries stabilize and improve their economy, the significance of scientific research increases and the expense of research can be justified in order to raise international recognition [5]. As research can easily become a financial black hole, it is important to show some form of return from monetary investment, in order to validate future outlay of expenditure. The most obvious way to secure further funding for research is to show that there is a relationship between the output from previous work and its effect on the scientific reputation of the country. A common, credible measure of the scientific prowess of a country is a scientific citation index (SCI), which easily facilitates comparison of research output through recorded publication. An SCI can focus on individual aspects of research output or view productivity in broader terms [6].

To evaluate the performance of countries in the research domain as general and determine the highest rankings, several scientometric indices have been proposed e. g. a number of documents, total counts of citations, citation per publication (CPP), publication per population (PPP), and H index which is an author-level metric that attempts to measure both the productivity and citation impact of the publications of a scientist or scholar [7]. But the study of scientific and clinically important subjects and urgency of the specific topic through the analysis of the features of scientific publications often remain inadequate.

Bearing the above in mind, we decided to study the characteristics and features of scientific articles devoted to the hip and knee arthroplasty. *The aim* of our research is to give an exact idea of the features of the study and publications of the hip and knee arthroplasty in different regions of the world and to identify little-known side of

this subject across the study of a decade of publications of the major Korean and Russian orthopedic journals.

## Materials and methods

To achieve our goal, we used the Internet search on Korean orthopedic journals in KoreaMed Services advanced search and internationally accessible web site of the Russian Journals with terms «Hip arthroplasty», «Knee arthroplasty». Our research covers a range of the archive articles from Korean journals: Clinics in Orthopedic Surgery, Journal of the Korean Orthopaedic Association, The Journal Hip & Pelvis, The Journal Knee Surgery & Related Research and in Russian publications the Journals were, «Traumatology and orthopedics of Russia», The Journal «Reporter of Traumatology and Orthopedics named Priorov», The Journal «Genij Ortopedii» and Ukraine journal which is published in Russian, Ukraine and English languages «The Journal Orthopaedics, Traumatology and Prosthetics» from 2005 to 2014. Because of the restricted access to materials in some databases, we received these materials through email, and we want to thank the staff of such journals as «Orthopaedics, Traumatology and Prosthetics» and «Reporter of Traumatology and Orthopedics named Priorov». These materials were delivered by our Uzbek authors from the Library of the Research Institute of Traumatology and Orthopedics and National Medical Library of the Republic of Uzbekistan.

All collected 615 Korean and Russian 361 journal articles have been downloaded and manually studied by the authors. Materials have been published in English, Korean, Russian and Ukrainian languages and each case has an English abstract. Some of our authors facilitated the analysis of the articles by helping in translations of the above languages. In order to understand completely the scope and scale of the publications, the results have been calculated and tabulated from all the articles devoted to hip and knee arthroplasty that were published in these journals. Based on the study of the subject-matter of each submitted article all papers were divided into three groups: topics representing hip arthroplasty, topics representing knee arthroplasty and articles devoted to general issues of both themes.

For the calculation and tabulation of the studied work, we used Microsoft Word and Microsoft Excel 2011. Each percentage ratio has been made on the above programs. The publication rates were calculated as absolute values and also as a relative percentage compared to all work retrieved in the study. Statistical analysis was performed with SPSS software for

Windows (version 20.0, SPSS Inc., Chicago, IL) for each year of articles publication, number of authors, country of origin and institution type. P-values < 0.05 were considered statistically significant.

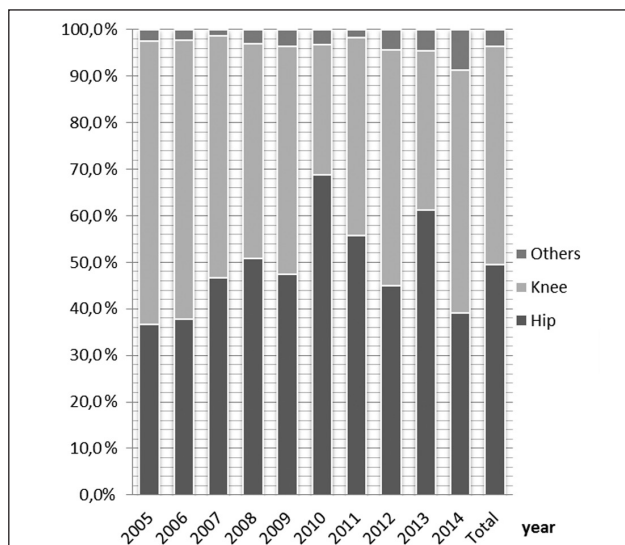
## Results and discussion

In the selection of the publications we had in mind the following facts: chosen journals are registered in many international databases, have international indexing and they are one of a major publisher in Association of Orthopedics and Traumatology of the two countries [8–10].

The annual number of Korean orthopedic journals Clinics in Orthopedic Surgery, Journal of the Korean Orthopaedic Association, The Journal Hip & Pelvis, The Journal Knee Surgery & Related Research and publications from 2005 to 2014 are displayed in Table 1.

The study shows that this in 10 year period 615 (100 %) articles published on the topic in hip and knee arthroplasty. Which include 305 (49.6 %) hip arthroplasty, 288 (46.8 %) knee arthroplasty articles and 22 (3.6 %) materials covering both topics or common questions of arthroplasty (Fig. 1).

The articles selected from Russian («Traumatology and orthopedics of Russia», «Reporter of Traumatology and Orthopedics named Priorov», «Genij Ortopedii») and Ukraine («Orthopaedics, Traumatology and Prosthetics») orthopedic journals — in the study period are demonstrated in Table 2. In the event of 100th Anniversary of the journal, Traumatology and Orthopedics of Russia, in its 40<sup>th</sup> issue in 2006, published a very high number of articles, in which a big number of articles were devoted to the hip and knee arthroplasty. The article surveying both hip and knee or the general problems of the arthroplasty were 50 (13.8 %), only hip arthroplasty were 235 (65 %) and only knee arthroplasty cases were 76 (21.2 %) from the all 361 Russian database (Table 2).



**Fig 1.** The percentage ratio of the articles devoted to hip arthroplasty, knee arthroplasty and articles covering both topics in Korean journals — Clinics in Orthopedic Surgery, Journal of the Korean Orthopaedic Association, The Journal Hip & Pelvis, The Journal Knee Surgery & Related Research over the last 10 years (2005–2014)

Many authors have studied the features of publications of hip and knee arthroplasty [4, 5, 11, 13, 14] which researched quantitative publication trends [4, 5, 13], response relationships, the difference between publications [11, 12, 14], index, factors or peculiarity of journals and authors [7, 16, 19, 20] and features of clinical approaches and solving problems at the hip and knee arthroplasty [15, 18, 21]. We have identified that the characteristics of a publication of articles on Korean and Russian journals has a significant difference. The articles covering both topics and common questions of arthroplasty in Russian journals were more 50 (13.5 %) than Korean 22 (3.5 %) journals data. Despite the fact that the number of Korean hip arthroplasty articles was larger — 305 (49.6 %) than

Table 1

**The number of the articles devoted to hip, knee arthroplasty and articles related to both topics in Korean journals — Clinics in Orthopedic Surgery, Journal of the Korean Orthopaedic Association, «Hip & Pelvis», «Knee Surgery & Related» Research over the last 10 years (2005–2014)**

Year	Clinics in Orthopedic Surgery			Journal of the Korean Orthopedic Association			Knee Surgery & Related Research		Hip & Pelvis		Subtotal		
	Hip	Knee	Both	Hip	Knee	Both	Knee	Both	Hip	Both	Hip	Knee	Both
2005	—	—	—	15	17	—	8	1	—	—	15	25	1
2006	—	—	—	14	16	1	11	—	3	—	17	27	1
2007	—	—	—	13	24	—	15	—	22	1	35	39	1
2008	—	—	—	10	20	1	11	—	24	1	34	31	2
2009	3	4	—	3	16	1	8	—	21	1	27	28	2
2010	4	2	—	3	8	—	8	—	37	2	44	18	2
2011	2	6	—	6	8	—	12	—	26	1	34	26	1
2012	2	5	1	5	9	1	21	1	24	—	31	35	3
2013	5	5	—	4	4	1	14	1	32	1	41	23	3
2014	5	10	4	3	5	—	21	1	19	1	27	36	6
Total	21	32	5	76	127	5	129	4	208	8	305	288	22

Table 2

The number of the articles devoted to hip, knee arthroplasty and articles related to both topics in Russian journals «Traumatology and orthopedics of Russia», «Reporter of Traumatology and Orthopedics named Priorov» «Genij Ortopedii» and Ukrainian journal «Orthopaedics, Traumatology and Prosthetics» over the last 10 years (2005–2014)

Year	Traumatology and orthopedics of Russia			Reporter of Traumatology and Orthopedics named Priorov			Genij Ortopedii			Orthopedics, Traumatology and Prosthetics			Subtotal		
	Hip	Knee	Both	Hip	Knee	Both	Hip	Knee	Both	Hip	Knee	Both	Hip	Knee	Both
2005	3	—	—	4	2	4	5	—	—	3	1	1	15	3	5
2006	45	11	7	1	—	1	2	—	—	2	1	—	50	12	8
2007	2	1	1	4	—	—	3	—	—	5	1	1	14	2	2
2008	7	3	1	4	—	—	2	—	—	5	1	2	18	4	3
2009	16	2	3	9	3	2	4	—	—	7	2	1	36	7	6
2010	6	—	—	8	2	—	3	—	2	6	—	—	23	2	2
2011	6	7	1	2	4	1	1	2	3	2	1	4	11	14	9
2012	5	3	2	10	5	2	6	2	4	6	2	—	27	12	8
2013	6	6	—	4	2	1	7	1	—	5	1	2	22	10	3
2014	6	3	1	4	3	2	4	2	—	5	2	1	19	10	4
Total	102	36	16	50	21	13	37	7	9	46	12	12	235	76	50

Russian hip articles — 235 (65 %) the value of Russian hip articles was definitely higher. It can be explained by the fact that researchers who published articles in Russia, studied hip arthroplasty and general problems of the arthroplasty more than the knee arthroplasty.

The publications from some countries show an uptrend [11, 17] while in few other countries there is tendency to decrease [13, 14] in the publication of articles, devoted to hip and knee arthroplasty. Our analysis indicate a slight increase in the total number of articles from 470 to 506, with growth in the amount of knee arthroplasty articles from 28 to 48 in Russian orthopedic journals in 2005–2014 (Fig 2).

The rates of use of total hip arthroplasty and total knee arthroplasty during the past 4 decades increased by all criteria [23], but results of the study of the articles shows that not all criteria were equally well realized in the Korean and Russian journal articles. We studied in detail the context of each journal article, and all databases were divided into six groups according to the value of published material separately for Korean and Russian groups (Fig 3). The first group of articles covers the surgery technique and technique of anesthesia during hip and knee arthroplasty. These articles in Russian journals were found in quantity of 91 (25 %) and in Korean databases were 168 (27.4 %) articles. The second group is devoted to the question of complications and rehabilitation which were 97 (27 %) in Russian journals and 144 (25.04 %) in Korean. This shows almost identical ratio of the studied material. Research and development of implants and technological features of the endoprosthesis equipment have a positive impact to the outcome of the operation [24, 25]. While the article percentage, which studied the implants and their additional hardware — instrumental questions of Korean journals were 69 (11.2 %) significantly lower than the Russian journals, which were 64 (17.7 %).

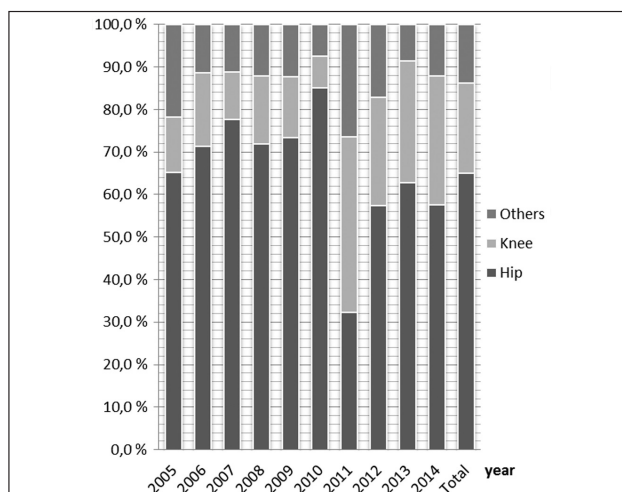


Fig 2. The ratio of the articles devoted to hip, knee arthroplasty and articles related to both topics in Russian journals «Traumatology and orthopedics of Russia», «Reporter of Traumatology and Orthopedics named Priorov», «Genij Ortopedii», «Orthopaedics, Traumatology and Prosthetics» over the last 10 years (2005–2014)

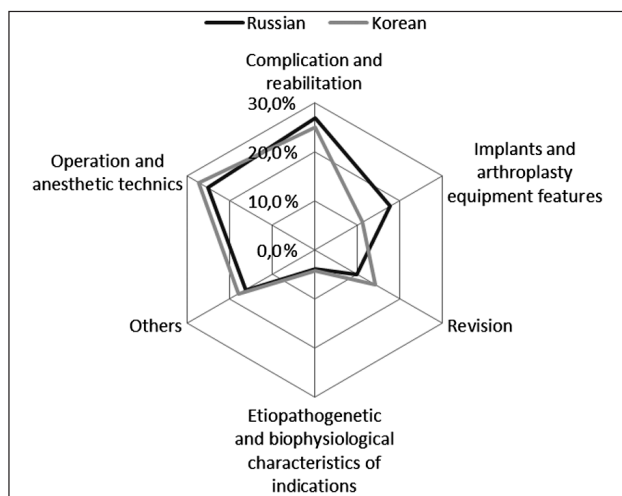


Fig 3. The difference between the context features of the articles devoted to hip and knee arthroplasty published in Korean and Russian journals over the last 10 years (2005–2014)

Another important finding of our study was the fact that there were very few studies on etiologic, pathogenesis aspects and the functional — physiological features of each patient in the question, which would help in improvement of surgery techniques and decreasing postoperative complications. The articles covering etiopathogenetical aspects hip and knee arthroplasty in Russian cases were 14 (3.9 %) and in Korean journals were 27 (4.4 %). Although the literature shows an increase in the study of revision hip and knee arthroplasty [15, 22], the number of articles describing revision arthroplasty in Russian journals — 36 (9.9 %) was lower than in Korean journals — 87 (14.1 %). The number of other articles that studied review articles, statistical analysis, measurements and examination by various methods before and after the operation amounted to 59 (16.4 %) in Russian journals and to 120 (17.88 %) in Korean journals (Fig 3). Arthroplasty register data shows that the number of knee arthroplasty in Russia remains low accounting 6530, and revision arthroplasty is only 8.3 % of all of the knee arthroplasty during the 2011–2013 years [26], when in Korea were making around 70000 arthroplasty every following years [27]. We think a big difference in the number of arthroplasties over the following years have led to the differences between researched area in hip and knee arthroplasty.

There are few shortcomings of our research. Due to the large amount of material and the wide scope of the study, we were not able to study all the issues related to the publication of hip and knee arthroplasty. We couldn't add all Korean and Russian medical journals in our research, which may have published the similar materials too.

## Conclusion

A research of versatile features of the hip and knee arthroplasty revealed some differences between the countries that can be evaluated with the study of scientific articles published in each region journals. The analysis of quantitative indicators and last trend in hip and knee arthroplasty suggest some changes in study topic in future. The research of etiopathogenetic characteristics indications for hip and knee arthroplasty, which allows improvement of the results remain insufficiently studied.

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## СИСТЕМНЫЙ ОБЗОР СТАТЕЙ, ПОСВЯЩЕННЫХ ЭНДОПРОТЕЗИРОВАНИЮ ТАЗОБЕДРЕННОГО И КОЛЕННОГО СУСТАВОВ, ОПУБЛИКОВАННЫХ В КОРЕЙСКИХ, РОССИЙСКИХ И УКРАИНСКИХ ЖУРНАЛАХ С 2005 ПО 2014 ГОДЫ

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