Kulak Burun Bogaz Ihtis Derg 2017;27(4):164-172 doi: 10.5606/kbbihtisas.2017.23326 

***Original Article / Çalışma - Araştırma***

# Top 100 cited articles in Meniere's disease research

## Meniere hastalığı araştırmasında en çok alıntı yapılan 100 makale

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***ABSTRACT***

**Objectives:** This bibliometric analysis aims to analyze the top 100 cited articles that contributed to the investigation of the Meniere's disease.

**Materials and Methods:** Study data were obtained by performing a search on the Web of Science (WOS). The study includes the indexed journals in the index of "Science Citation Index Expanded". Meniere's disease was written in the "WOS basic research" field, and all years option was selected in the title setting. Afterwards, "times cited" was ranked from the highest to the lowest. The analysis was carried out by adding the results to the top 100 cited articles in the marked list.

**Results:** The two most frequently cited articles published by Japan Nagoya University and Harvard University had 174 and 172 citations, respectively. The number of citations for the article that followed these two articles was 128. It was seen that the first 100 articles that had the highest number of citations were cited 4,867 times in total. The top 100 articles were published in a total of 31 high-impact journals, where Laryngoscope held in the first place with 18 articles. Ninety-six of those articles were original articles and four of them were reviews. Of the 100 most cited articles, 49 were from the United States.

**Conclusion:** The analysis of articles having high citations with the title of Meniere's disease will allow the recognition of progress of treatment of this disease. It also provides a historical perspective for the development of the Meniere's disease studies.

***Keywords:*** Citation; Meniere's disease; research.

***ÖZ***

**Amaç:** Bu bibliyometrik çalışmada, Meniere hastalığının araştırılmasında en çok alıntı yapılan 100 makale analiz edildi.

**Gereç ve Yöntemler:** Çalışma verileri Web of Science (WOS) portalında bir arama yapılarak elde edildi. Çalışma, "Science Citation Index Expanded" dizininde belirtilen dergileri içermekteydi. "WOS temel araştırma" alanına Meniere hastalığı yazılıp başlıkta tüm yıllar seçeneği seçildi. Daha sonra, kaç kez alıntı yapıldığı en yüksekten en düşüğe sıralandı. Analiz, çıkan sonuçların en çok alıntı yapılan 100 makalenin işaretli listeye eklenmesiyle gerçekleştirildi.

**Bulgular:** En çok alıntı yapılan iki makale Japonya Nagoya Üniversitesi ve Harvard Üniversitesi tarafından yayınlanmış olup sırasıyla 174 ve 172 alıntıya sahipti. Bu iki makaleyi takip eden makalenin alıntı sayısı ise 128 idi. En fazla sayıda alıntı yapılan ilk 100 makalenin toplam 4.867 kez alıntılandığı görüldü. En iyi 100 makalenin 31 etkili dergide yayınlandığı ve Laryngoscope'un 18 makaleyle ilk sırada yer aldığı görüldü. Bu makalelerin 96'sı orijinal olup, dördü derlemeydi. En çok alıntı yapılan 100 makaleden 49'u Amerika Birleşik Devletleri'ne aitti.

**Sonuç:** Yüksek alıntı yapılan Meniere hastalığı başlıklı makalelerin analizi, bu hastalığın tedavisindeki ilerlemenin tanınmasını sağlayacaktır. Aynı zamanda Meniere hastalığı çalışmalarının tarihsel açıdan gelişimini göstermektedir.

***Anahtar Sözcükler:*** Alıntı; Meniere hastalığı; araştırma.

Available online at
www.kbbihtisas.org
doi: 10.5606/kbbihtisas.2017.23326
QR (Quick Response) Code

Received / *Geliş tarihi:* April 22, 2017 Accepted / *Kabul tarihi:* August 22, 2017

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Since Prosper Meniére reported in 1861 that vertigo, balance and hearing disorders were due to a lesion in the inner ear, there has been many developments related to the pathophysiology, etiology and treatment of the disease in the historical process, and articles regarding these developments have taken place in the literature.[1,2] Despite major advances, the disease continues to keep being an enigma. Despite the fact that the progresses in relation to Meniere's disease have been recognized, the studies that provide these progresses are not well known.

Today, the studies that are most frequently cited in many areas are categorized.[3-7] These classifications help people who are interested in the subject to easily reach and analyze the studies, that are in high volumes. However, which works have high impact in the development of the study are not very well known. Decisions made in the clinic are based on high quality studies and the evidences provided by these studies. The most important factor that reveals the methodological qualities of the studies is related to the progress of the citations and the highness of the impact factor of the published journal. Examination of the top 100 most frequently quoted articles on the Meniere's disease may shed light on the future research.

Recently, many expertise areas have identified and analyzed "citation classics" (most frequently read articles or articles that are cited more than 100 times) in their fields. There are also several journals that publish their own citation classics.[8,9] In this study, we aimed to provide the interested researchers to easily access and analyze the studies, and to guide the future studies by emphasizing the highly cited works on Meniere's disease, whose pathophysiology, diagnosis and treatment have not been fully addressed.

## MATERIALS AND METHODS

A computer-based literature search was conducted using the Web of Science database. The relevant articles were selected using a highly sensitive search strategy. After entering the Web of Science database as of February 20th, 2017, by typing "Meniere" to the section of "the title of the article", the related articles were found. No restrictions were applied while this was done. First, the articles were ranked according to the amount of citations they received from the highest to the lowest. We created the list by choosing the first hundred articles among the results. Then, these 100 articles, which were added to the list of marked articles, were subjected to detailed examination for the analysis. The articles were analyzed according to the number of citations, the countries, centers, journals and years in which they were published. Then, the first and second names of the authors were listed and examined. In addition, detailed analysis was done according to the types of content and writing.

## RESULTS

In the search using Web of Science, 1,214 articles related to Meniere's disease were found. These were the articles from the years between 1975 and 2017. Among those, the most frequently cited 100 articles are shown in Table 1.

It was seen that the article that was most frequently cited has 174 citations, and the least frequently cited article had 28 citations. The average number of citations was determined as 48. Of the 100 most cited articles, 71 belonged to the 10-year-period between 1997 and 2006. The distribution of the articles by years is shown in Table 2.

The 100 most cited articles were written in 43 countries and two articles were from Turkey. Most of the articles, 49, were from the United States. Japan and Germany, respectively, followed the United States with 11 and nine articles. The distribution of the most cited articles by country is shown in Table 3. When the centers were examined, Johns Hopkins University was the first to publish nine articles. Harvard University had seven articles and Nagoya University had five articles in the second and third places (Table 4). The Top 100 articles were published in 31 high-impact journals. Top three among them were Laryngoscope with 18, Otology Neurotology with 15 and Acta Otolaryngology with 10 articles (Table 5).

The 100 most cited articles examined in terms of authors. Lloyd Brooks Minor from John Hopkins University was involved in seven articles while Tsutomu Nakashima and Shinji Naganawa from Nagoya University followed him with five articles. The list of authors involved in three or more articles is shown in Table 6. Among the authors listed in this table, Murofushi

**Table 1.** The top 100 cited articles in Meniére disease research

| Rank | Articles | No. of citations |
|---|---|---|
| 1. | Nakashima, Tsutomu, Naganawa, Shinji, Sugiura, Makoto, et al. Visualization of endolymphatic hydrops in patients with Meniere's disease. Laryngoscope 2007;117:415-20. | 174 |
| 2. | Merchant SN, Adams JC, Nadol JB Jr. Pathophysiology of Meniere's syndrome: are symptoms caused by endolymphatic hydrops? Otol Neurotol 2005;26:74-81. | 172 |
| 3. | Radtke A, Lempert T, Gresty MA, Brookes GB, Bronstein AM, Neuhauser H. Migraine and Ménière's disease: is there a link? Neurology 2002;59:1700-4. | 128 |
| 4. | Sajjadi H, Paparella MM. Meniere's disease. Lancet 2008;372:406-14. | 124 |
| 5. | Coats AC: The summating potential and Meniere's disease: I. Summating potential amplitude in Meniere and non-Meniere ears . Arch Otolaryngol Head Neck Surg 1981;107:199-208. | 115 |
| 6. | de Waele, C; Huy, PTB; Diard, JP; et al. Saccular dysfunction in Meniere's disease. American Journal of Otology 1999;20:223-32. | 113 |
| 7. | Fransen E, Verstreken M, Verhagen WI, Wuyts FL, Huygen PL, D'Haese P, et al. High prevalence of symptoms of Menière's disease in three families with a mutation in the COCH gene. Hum Mol Genet 1999;8:1425-9. | 102 |
| 8. | Rauch SD, Zhou G, Kujawa SG, Guinan JJ, Herrmann BS. Vestibular evoked myogenic potentials show altered tuning in patients with Ménière's disease. Otol Neurotol 2004;25:333-8. | 98 |
| 9. | Minor LB, Schessel DA, Carey JP. Meniere's disease. Current Opinion in Neurology 2004;17:9-16. | 97 |
| 10. | Minor LB. Intratympanic gentamicin for control of vertigo in Meniere's disease: Vestibular signs that specify completion of therapy. American Journal of Otology 1999;20:209-19. | 96 |
| 11. | Blakley BW. Update on intratympanic gentamicin for Meniere's disease. Laryngoscope 2000;110:236-40. | 91 |
| 12 | Chia SH1, Gamst AC, Anderson JP, Harris JP. Intratympanic gentamicin therapy for Meniere's disease: A meta-analysis. Otol Neurotol 2004;25:544-52 | 88 |
| 13. | Silverstein H, Isaacson JE, Olds MJ, Rowan PT, Rosenberg S. Dexamethasone inner ear perfusion for the treatment of Meniere's disease: a prospective, randomized, double-blind, crossover trial. Am J Otol 1998;19:196-201. | 86 |
| 14. | Cohen-Kerem R, Kisilevsky V, Einarson TR, Kozer E, Koren G, Rutka JA. Intratympanic gentamicin for Menière's disease: a meta-analysis. Laryngoscope 2004;114:2085-91. | 82 |
| 15. | Garduño-Anaya MA, Couthino De Toledo H, Hinojosa-González R, Pane-Pianese C, Ríos-Castañeda LC. Dexamethasone inner ear perfusion by intratympanic injection in unilateral Ménière's disease: a two-year prospective, placebo-controlled, double-blind, randomized trial. Otolaryngol Head Neck Surg 2005;133:285-94. | 75 |
| 16. | Harner SG, Driscoll CL, Facer GW, Beatty CW, McDonald TJ. Long-term follow-up of transtympanic gentamicin for Ménière's syndrome. Otol Neurotol 2001;22:210-4. | 62 |
| 17. | Shea JJ Jr, Ge X. Dexamethasone perfusion of the labyrinth plus intravenous dexamethasone for Ménière's disease. Otolaryngol Clin North Am 1996;29:353-8. | 61 |
| 18. | Kumar A, Kaur H, Devi P, Mohan V. Role of coenzyme Q10 (CoQ10) in cardiac disease, hypertension and Meniere-like syndrome. Pharmacol Ther 2009;124:259-68. | 60 |
| 19. | Silverstein H, Arruda J, Rosenberg SI, Deems D, Hester TO. Direct round window membrane application of gentamicin in the treatment of Meniere's disease. Otolaryngol Head Neck Surg 1999;120:649-55. | 57 |
| 20. | Rauch SD, Oas JG. Intratympanic gentamicin for treatment of intractable Meniere's disease: a preliminary report. Laryngoscope 1997;107:49-55. | 55 |
| 21. | Hirsch BE, Kamerer DB. Intratympanic gentamicin therapy for Ménière's disease. Am J Otol 1997;18:44-51. | 53 |
| 22. | Huppert D, Strupp M, Brandt T. Long-term course of Menière's disease revisited. Acta Otolaryngol 2010;130:644-51. | 52 |
| 23. | Kinney SE, Sandridge SA, Newman CW. Long-term effects of Ménière's disease on hearing and quality of life. Am J Otol 1997;18:67-73. | 52 |
| 24. | Carey JP, Minor LB, Peng GC, Della Santina CC, Cremer PD, Haslwanter T. Changes in the three-dimensional angular vestibulo-ocular reflex following intratympanic gentamicin for Ménière's disease. J Assoc Res Otolaryngol 2002;3:430-43. | 51 |
| 25. | Boleas-Aguirre MS, Lin FR, Della Santina CC, Minor LB, Carey JP. Longitudinal results with intratympanic dexamethasone in the treatment of Ménière's disease. Otol Neurotol 2008;29:33-8. | 49 |
| 26. | Akkuzu G, Akkuzu B, Ozluoglu LN. Vestibular evoked myogenic potentials in benign paroxysmal positional vertigo and Meniere's disease. Eur Arch Otorhinolaryngol 2006;263:510-7. | 49 |
| 27. | Söderman AC, Bagger-Sjöbäck D, Bergenius J, Langius A. Factors influencing quality of life in patients with Ménière's disease, identified by a multidimensional approach. Otol Neurotol 2002;23:941-8. | 49 |
| 28. | Kaplan DM, Nedzelski JM, Chen JM, Shipp DB. Intratympanic gentamicin for the treatment of unilateral Meniere's disease. Laryngoscope 2000;110:1298-305. | 49 |
| 29. | Usami S, Takahashi K, Yuge I, Ohtsuka A, Namba A, Abe S, et al. Mutations in the COCH gene are a frequent cause of autosomal dominant progressive cochleo-vestibular dysfunction, but not of Meniere's disease. Eur J Hum Genet 2003;11:744-8. | 48 |

**Tablo 1** Continues

| Rank | Articles | No. of citations |
|---|---|---|
| 30. | Driscoll CL, Kasperbauer JL, Facer GW, Harner SG, Beatty CW. Low-dose intratympanic gentamicin and the treatment of Meniere's disease: preliminary results. Laryngoscope 1997;107:83-9. | 47 |
| 31. | Sennaroglu L, Sennaroglu G, Gursel B, Dini FM. Intratympanic dexamethasone, intratympanic gentamicin, and endolymphatic sac surgery for intractable vertigo in Meniere's disease. Otolaryngol Head Neck Surg 2001;125:537-43. | 46 |
| 32. | Kotimäki J, Sorri M, Aantaa E, Nuutinen J. Prevalence of Meniere disease in Finland. Laryngoscope 1999;109:748-53. | 44 |
| 33. | Nakashima T, Naganawa S, Teranishi M, Tagaya M, Nakata S, Sone M, et al. Endolymphatic hydrops revealed by intravenous gadolinium injection in patients with Ménière's disease. Acta Otolaryngol 2010;130:338-43. | 43 |
| 34. | Naganawa S, Yamazaki M, Kawai H, Bokura K, Sone M, Nakashima T. Visualization of endolymphatic hydrops in Ménière's disease with single-dose intravenous gadolinium-based contrast media using heavily T(2)-weighted 3D-FLAIR. Magn Reson Med Sci 2010;9:237-42. | 43 |
| 35. | Barrs DM, Keyser JS, Stallworth C, McElveen JT Jr. Intratympanic steroid injections for intractable Ménière's disease. Laryngoscope 2001;111:2100-4. | 43 |
| 36. | Youssef TF, Poe DS. Intratympanic gentamicin injection for the treatment of Meniere's disease. Am J Otol 1998;19:435-42. | 43 |
| 37. | House JW, Doherty JK, Fisher LM, Derebery MJ, Berliner KI. Meniere's disease: prevalence of contralateral ear involvement. Otol Neurotol 2006;27:355-61. | 42 |
| 38. | Park HJ, Migliaccio AA, Della Santina CC, Minor LB, Carey JP. Search-coil head-thrust and caloric tests in Ménière's disease. Acta Otolaryngol 2005;125:852-7. | 42 |
| 39. | Yardley L, Dibb B, Osborne G. Factors associated with quality of life in Menière's disease. Clin Otolaryngol Allied Sci 2003;28:436-41. | 42 |
| 40. | Thomsen J, Charabi S, Tos M. Preliminary results of a new delivery system for gentamicin to the inner ear in patients with Meniere's disease. Eur Arch Otorhinolaryngol 2000;257:362-5. | 42 |
| 41. | Kaasinen S, Pyykkö I, Ishizaki H, Aalto H. Intratympanic gentamicin in Meniere's disease. Acta Otolaryngol 1998;118:294-8. | 42 |
| 42. | Murofushi T, Halmagyi GM, Yavor RA. Intratympanic gentamicin in Ménière's disease: results of therapy. Am J Otol 1997;18:52-7. | 42 |
| 43. | Havia M, Kentala E, Pyykkö I. Prevalence of Menière's disease in general population of Southern Finland. Otolaryngol Head Neck Surg 2005;133:762-8. | 41 |
| 44. | Gates GA, Green JD Jr, Tucci DL, Telian SA. The effects of transtympanic micropressure treatment in people with unilateral Meniere's disease. Arch Otolaryngol Head Neck Surg 2004;130:718-25. | 41 |
| 45. | Lange G, Maurer J, Mann W. Long-term results after interval therapy with intratympanic gentamicin for Menière's disease. Laryngoscope 2004;114:102-5. | 41 |
| 46. | De Waele C, Meguenni R, Freyss G, Zamith F, Bellalimat N, Vidal PP, et al. Intratympanic gentamicin injections for Meniere disease: vestibular hair cell impairment and regeneration. Neurology 2002;59:1442-4. | 41 |
| 47. | Wu IC, Minor LB. Long-term hearing outcome in patients receiving intratympanic gentamicin for Ménière's disease. Laryngoscope 2003;113:815-20. | 40 |
| 48. | Mhatre AN, Jero J, Chiappini I, Bolasco G, Barbara M, Lalwani AK. Aquaporin-2 expression in the mammalian cochlea and investigation of its role in Meniere's disease. Hear Res 2002;170:59-69. | 40 |
| 49. | Paparella MM, Djalilian HR. Etiology, pathophysiology of symptoms, and pathogenesis of Meniere's disease. Otolaryngol Clin North Am 2002;35:529-45. | 40 |
| 50. | Shin SO, Billings PB, Keithley EM, Harris JP. Comparison of anti-heat shock protein 70 (anti-hsp70) and anti-68-kDa inner ear protein in the sera of patients with Meniere's disease. Laryngoscope 1997;107:222-7. | 40 |
| 51. | Gürkov R, Flatz W, Louza J, Strupp M, Krause E. In vivo visualization of endolyphatic hydrops in patients with Meniere's disease: correlation with audiovestibular function. Eur Arch Otorhinolaryngol 2011;268:1743-8 | 38 |
| 52. | Gürkov R, Flatz W, Louza J, Strupp M, Krause E. In vivo visualization of endolyphatic hydrops in patients with Meniere's disease: correlation with audiovestibular function. Eur Arch Otorhinolaryngol 2011;268:1743-8. | 37 |
| 53. | Don M, Kwong B, Tanaka C. A diagnostic test for Ménière's Disease and Cochlear Hydrops: impaired high-pass noise masking of auditory brainstem responses. Otol Neurotol 2005;26:711-22. | 36 |
| 54. | Murofushi T, Matsuzaki M, Takegoshi H. Glycerol affects vestibular evoked myogenic potentials in Meniere's disease. Auris Nasus Larynx 2001;28:205-8. | 36 |
| 55. | Atlas JT, Parnes LS. Intratympanic gentamicin titration therapy for intractable Meniere's disease. Am J Otol 1999;20:357-63. | 36 |
| 56. | Taylor RL, Wijewardene AA, Gibson WP, Black DA, Halmagyi GM, Welgampola MS. The vestibular evoked-potential profile of Ménière's disease. Clin Neurophysiol 2011;122:1256-63. | 35 |
| 57. | Gross EM, Ress BD, Viirre ES, Nelson JR, Harris JP. Intractable benign paroxysmal positional vertigo in patients with Meniere's disease. Laryngoscope 2000;110:655-9. | 35 |
| 58. | Calabrese V, Cornelius C, Maiolino L, Luca M, Chiaramonte R, Toscano MA, et al. Oxidative stress, redox homeostasis and cellular stress response in Ménière's disease: role of vitagenes. Neurochem Res 2010;35:2208-17. | 34 |

**Tablo 1** Continues

| Rank | Articles | No. of citations |
|---|---|---|
| 59. | Cha YH, Kane MJ, Baloh RW. Familial clustering of migraine, episodic vertigo, and Ménière's disease. Otol Neurotol 2008;29:93-6. | 34 |
| 60. | Cha YH, Brodsky J, Ishiyama G, Sabatti C, Baloh RW. The relevance of migraine in patients with Meńière's disease. Acta Otolaryngol 2007;127:1241-5. | 34 |
| 61. | Timmer FC, Zhou G, Guinan JJ, Kujawa SG, Herrmann BS, Rauch SD. Vestibular evoked myogenic potential (VEMP) in patients with Ménière's disease with drop attacks. Laryngoscope 2006;116:776-9. | 34 |
| 62. | Selivanova OA, Gouveris H, Victor A, Amedee RG, Mann W. Intratympanic dexamethasone and hyaluronic acid in patients with low-frequency and Ménière's-associated sudden sensorineural hearing loss. Otol Neurotol 2005;26:890-5. | 34 |
| 63. | da Costa SS, de Sousa LC, Piza MR. Meniere's disease: overview, epidemiology, and natural history. Otolaryngol Clin North Am 2002;35:455-95. | 34 |
| 64. | Couloigner V, Grayeli AB, Bouccara D, Julien N, Sterkers O. Surgical treatment of the high jugular bulb in patients with Ménière's disease and pulsatile tinnitus. Eur Arch Otorhinolaryngol 1999;256:224-9. | 34 |
| 65. | Thomsen J1, Bonding P, Becker B, Stage J, Tos M. The non-specific effect of endolymphatic sac surgery in treatment of Meniere's disease: a prospective, randomized controlled study comparing "classic" endolymphatic sac surgery with the insertion of a ventilating tube in the tympanic membrane. Acta Otolaryngol 1998;118:769-73. | 34 |
| 66. | Hoffer ME, Balough B, Henderson J, DeCicco M, Wester D, O'Leary MJ, et al. Use of sustained release vehicles in the treatment of Meniere's disease. Otolaryngol Clin North Am 1997;30:1159-66. | 34 |
| 67. | Pyykkö I, Zou J, Poe D, Nakashima T, Naganawa S. Magnetic resonance imaging of the inner ear in Meniere's disease. Otolaryngol Clin North Am 2010;43:1059-80. | 33 |
| 68. | Kitahara T, Kubo T, Okumura S, Kitahara M. Effects of endolymphatic sac drainage with steroids for intractable Meniere's disease: a long-term follow-up and randomized controlled study. Laryngoscope 2008;118:854-61. | 33 |
| 69. | Yardley L, Kirby S. Evaluation of booklet-based self-management of symptoms in Ménière disease: a randomized controlled trial. Psychosom Med 2006;68:762-9. | 33 |
| 70. | Kim HH, Kumar A, Battista RA, Wiet RJ. Electrocochleography in patients with Meniere's disease. Am J Otolaryngol 2005;26:128-31. | 33 |
| 71. | Derebery MJ. Allergic management of Meniere's disease: an outcome study. Otolaryngol Head Neck Surg 2000;122:174-82. | 33 |
| 72. | Andersson G, Hägnebo C, Yardley L. Stress and symptoms of Menière's disease: a time-series analysis. J Psychosom Res 1997;43:595-603. | 33 |
| 73. | Arnold W, Niedermeyer HP. Herpes simplex virus antibodies in the perilymph of patients with Menière disease. Arch Otolaryngol Head Neck Surg 1997;123:53-6. | 33 |
| 74. | Casani AP, Piaggi P, Cerchiai N, Seccia V, Franceschini SS, Dallan I. Intratympanic treatment of intractable unilateral Meniere disease: gentamicin or dexamethasone? A randomized controlled trial. Otolaryngol Head Neck Surg 2012;146:430-7. | 32 |
| 75. | Manzari L, Tedesco AR, Burgess AM, Curthoys IS. Ocular and cervical vestibular-evoked myogenic potentials to bone conducted vibration in Ménière's disease during quiescence vs during acute attacks. Clin Neurophysiol 2010;121:1092-101. | 32 |
| 76. | Brinson GM, Chen DA, Arriaga MA. Endolymphatic mastoid shunt versus endolymphatic sac decompression for Ménière's disease. Otolaryngol Head Neck Surg 2007;136:415-21. | 32 |
| 77. | Lustig LR, Yeagle J, Niparko JK, Minor LB. Cochlear implantation in patients with bilateral Ménière's syndrome. Otol Neurotol 2003;24:397-403. | 32 |
| 78. | Neff BA, Staab JP, Eggers SD, Carlson ML, Schmitt WR, Van Abel KM, et al. Auditory and vestibular symptoms and chronic subjective dizziness in patients with Ménière's disease, vestibular migraine, and Ménière's disease with concomitant vestibular migraine. Otol Neurotol 2012;33:1235-44. | 31 |
| 79. | Tagaya M, Yamazaki M, Teranishi M, Naganawa S, Yoshida T, Otake H, et al. Endolymphatic hydrops and blood-labyrinth barrier in Ménière's disease. Acta Otolaryngol 2011;131:474-9. | 31 |
| 80. | Thomsen J, Sass K, Odkvist L, Arlinger S. Local overpressure treatment reduces vestibular symptoms in patients with Meniere's disease: a clinical, randomized, multicenter, double-blind, placebo-controlled study. Otol Neurotol 2005;26:68-73. | 31 |
| 81. | Stokroos R, Kingma H. Selective vestibular ablation by intratympanic gentamicin in patients with unilateral active Ménière's disease: a prospective, double-blind, placebo-controlled, randomized clinical trial. Acta Otolaryngol 2004;124:172-5. | 31 |
| 82. | Hoffer ME, Kopke RD, Weisskopf P, Gottshall K, Allen K, Wester D, et al. Use of the round window microcatheter in the treatment of Meniere's disease. Laryngoscope 2001;111:2046-9. | 31 |
| 83. | Densert B, Sass K. Control of symptoms in patients with Meniere's disease using middle ear pressure applications: two years follow-up. Acta Otolaryngol 2001;121:616-21. | 31 |
| 84. | Yoo TJ, Shea J Jr, Ge X, Kwon SS, Yazawa Y, Sener O, et al. Presence of autoantibodies in the sera of Meniere's disease. Ann Otol Rhinol Laryngol 2001;110:425-9. | 31 |
| 85. | Conlon BJ, Gibson WP. Electrocochleography in the diagnosis of Meniere's disease. Acta Otolaryngol 2000;120:480-3. | 31 |

**Tablo 1** Continues

| Rank | Articles | No. of citations |
|---|---|---|
| 86. | Gürkov R, Flatz W, Louza J, Strupp M, Ertl-Wagner B, Krause E. In vivo visualized endolymphatic hydrops and inner ear functions in patients with electrocochleographically confirmed Ménière's disease. Otol Neurotol 2012;33:1040-5. | 30 |
| 87. | Pullens B, van Benthem PP. Intratympanic gentamicin for Ménière's disease or syndrome. Cochrane Database Syst Rev 2011 Mar 16;CD008234. | 30 |
| 88. | Carey J. Intratympanic gentamicin for the treatment of Meniere's disease and other forms of peripheral vertigo. Otolaryngol Clin North Am 2004;37:1075-90. | 30 |
| 89. | Havia M, Kentala E. Progression of symptoms of dizziness in Ménière's disease. Arch Otolaryngol Head Neck Surg 2004;130:431-5. | 30 |
| 90. | Vrabec JT. Herpes simplex virus and Meniere's disease. Laryngoscope 2003;113:1431-8. | 30 |
| 91. | Gazquez I, Soto-Varela A, Aran I, Santos S, Batuecas A, Trinidad G, et al. High prevalence of systemic autoimmune diseases in patients with Menière's disease. PLoS One 2011;6:26759. | 29 |
| 92. | Huang CH, Wang SJ, Young YH. Localization and prevalence of hydrops formation in Ménière's disease using a test battery. Audiol Neurootol 2011;16:41-8. | 29 |
| 93. | Murofushi T, Ozeki H, Inoue A, Sakata A. Does migraine-associated vertigo share a common pathophysiology with Meniere's disease? Study with vestibular-evoked myogenic potential. Cephalalgia 2009;29:1259-66. | 29 |
| 94. | Ferraro JA, Durrant JD. Electrocochleography in the evaluation of patients with Ménière's disease/endolymphatic hydrops. J Am Acad Audiol 2006;17:45-68. | 29 |
| 95. | Anderson JP, Harris JP. Impact of Ménière's disease on quality of life. Otol Neurotol 2001;22:888-94. | 29 |
| 96. | Levine S, Margolis RH, Daly KA. Use of electrocochleography in the diagnosis of Meniere's disease. Laryngoscope 1998;108:993-1000. | 29 |
| 97. | Densert B, Densert O, Arlinger S, Sass K, Odkvist L. Immediate effects of middle ear pressure changes on the electrocochleographic recordings in patients with Menière's disease: a clinical placebo-controlled study. Am J Otol 1997;18:726-33. | 29 |
| 98. | Coker NJ, Coker RR, Jenkins HA, Vincent KR. Psychological profile of patients with Menière's disease. Arch Otolaryngol Head Neck Surg 1989;115:1355-7. | 29 |
| 99. | Lopez-Escamez JA, Carey J, Chung WH, Goebel JA, Magnusson M, Mandalà M, et al. Diagnostic criteria for Menière's disease. J Vestib Res 2015;25:1-7. | 28 |
| 100. | Quaranta A, Marini F, Sallustio V. Long-term outcome of Ménière's disease: endolymphatic mastoid shunt versus natural history. Audiol Neurootol 1998;3:54-60. | 28 |

contributed to the list with three first names, while the other authors contributed to the list with at most two first names.

## DISCUSSION

Bibliometric analysis can be done in many areas and for many purposes today.[10,11] Bibliometric analyses also reveal the historical development of the relevant area.[11] With this citation analysis on Meniere's disease studies, it will be provided for the authors to recognize the classical studies and high impact journals. This study is also one of the first studies under the title of Meniere's disease.

In the analysis of the 100 most cited articles, we can see that the articles related to the treatment of Meniere's disease are more prevalent. Intratympanic injection of gentamicin was the first type of treatment with 24 articles among 49 articles about the treatment, and intratympanic cortisone injection is in the second place with nine articles. Apart from the treatment, pathophysiology, objective diagnostic tests and imaging modalities, and Meniere disease and migraine relationship constitute other main areas of publication.

Top 100 citation articles will continue to be cited over time. For this reason, it is expected that the number of citations is higher in articles with earlier publication dates. On the other hand, milestone developments on the issue have been influencing the citations and the trend of publication.[12] Most of the articles with the highest number of citations and that have the topic of Meniere (71 articles) were published in the period between 1997 and 2006. Transtympanic injection treatments have predominantly constituted the main topic in this period. The first two most cited articles addressed endolymphatic hydrops and their publication dates were 2007 and 2005,

**Table 2.** Distribution of the top-cited articles in Meniére disease research by years

| Year | Cited |
|---|---|
| 1981 | 1 |
| 1989 | 1 |
| 1996 | 1 |
| 1997 | 10 |
| 1998 | 6 |
| 1999 | 7 |
| 2000 | 6 |
| 2001 | 8 |
| 2002 | 7 |
| 2003 | 5 |
| 2004 | 9 |
| 2005 | 8 |
| 2006 | 5 |
| 2007 | 4 |
| 2008 | 4 |
| 2009 | 2 |
| 2010 | 6 |
| 2011 | 6 |
| 2012 | 3 |
| 2015 | 1 |

respectively. The first article reported that the researchers observed the endolymphatic hydrops for the first time in Meniere patients. The second article was a histopathological study regarding the role of endolymphatic hydrops in Meniere's disease. The fact that the article questioning the relationship between migraine and Meniere being in the third place on the list indicates that the articles containing the interests of different disciplines may also be highly cited.[13] The article cited in the fourth place was a review and it had compiled general information about Meniere's disease. Review articles are also among the most commonly used articles when writing a new article, and thus can have too many citations.[13]

It has been seen that 49 of the 100 articles were originated from the United States. Also in the studies conducted in other fields, it has been observed that the articles originating from the United States are in the first place.[3-6] Johns Hopkins University and Harvard University, which are in the top three in terms of number of publications, are also in the top rankings as they are in other bibliographic researches. This may be due to the wide patient population and the

**Table 3.** Countries with two or more top cited

| No | Country | Cited |
|---|---|---|
| 1 | USA | 49 |
| 2 | Japan | 11 |
| 3 | Germany | 9 |
| 4 | Italy | 7 |
| 5 | Sweden | 7 |
| 6 | Australia | 6 |
| 7 | Finland | 5 |
| 8 | Canada | 4 |
| 9 | England | 4 |
| 10 | Netherlands | 4 |
| 11 | Denmark | 3 |
| 12 | France | 3 |
| 13 | Spain | 3 |
| 14 | Belgium | 2 |
| 15 | South Korea | 2 |
| 16 | Turkey | 2 |

**Table 4.** Institutions of origin with two or more top-cited

| Institutions | Cited |
|---|---|
| Johns Hopkins University | 9 |
| Harvard University | 7 |
| Nagoya University | 5 |
| University Calif San Diego | 4 |
| Ludwig Maximilian University of Munich | 4 |
| Gentofte University Hospital | 3 |
| Massachusetts Eye Ear Infirmary | 3 |
| University Sydney | 3 |
| Baylor College of Medicine | 2 |
| Ear Research Foundation | 2 |
| Hospital Lariboisiere | 2 |
| Hospital Poniente | 2 |
| House Ear Research Institute | 2 |
| Johns Hopkins Outpatient Center | 2 |
| Karolinska Hospital | 2 |
| Lund University | 2 |
| Mayo Clinic Mayo Foundation | 2 |
| Royal Prince Alfred Hospital | 2 |
| University Calif Los Angeles | 2 |
| University Helsinki Hospital | 2 |
| University Mainz | 2 |
| University Pittsburgh | 2 |
| University Roma La Sapienza | 2 |
| University Southampton | 2 |
| University Tokyo | 2 |
| University Toronto | 2 |
| United States Navy | 2 |

**Table 5.** Journals in which the top 100 cited articles were published

| Journal | Cited |
|---|---|
| Laryngoscope | 18 |
| Otology Neurotology | 15 |
| Acta Oto Laryngologica | 10 |
| American Journal of Otology | 9 |
| Otolaryngology Head and Neck Surgery | 7 |
| Otolaryngologic Clinics of North America | 6 |
| Archives of Otolaryngology Head Neck Surgery | 5 |
| European Archives of Oto-Rhino-Laryngology | 4 |
| Audiology and Neuro Otology | 2 |
| Clinical Neurophysiology | 2 |
| Neurology | 2 |
| American Journal of Otolaryngology | 1 |
| Annals of Otology Rhinology and Laryngology | 1 |
| Auris Nasus Larynx | 1 |
| Cephalalgia | 1 |
| Clinical Otolaryngology | 1 |
| Cochrane Database of Systematic Reviews | 1 |
| Current Opinion in Neurology | 1 |
| European Journal of Human Genetics | 1 |
| Hearing Research | 1 |
| Human Molecular Genetics | 1 |
| Jaro | 1 |
| Journal of Psychosomatic Research | 1 |
| Journal of the American Academy of Audiology | 1 |
| Journal of Vestibular Research Equilibrium Orientation | 1 |
| Lancet | 1 |
| Magnetic Resonance in Medical Sciences | 1 |
| Neurochemical Research | 1 |
| Pharmacology Therapeutics | 1 |
| Plos One | 1 |
| Psychosomatic Medicine | 1 |

**Table 6.** Most common authors of the top 100 cited articles

| Author | No. of articles |
|---|---|
| Minor LB | 7 |
| Naganawa S | 5 |
| Nakashima T | 5 |
| Carey JP | 4 |
| Harris JP | 4 |
| Sone M | 4 |
| Strupp M | 4 |
| Beatty CW | 3 |
| Della Santina CC | 3 |
| Murofushi T | 3 |
| Nakata S | 3 |
| Pyykko I | 3 |
| Rauch SD | 3 |
| Sass K | 3 |
| Teranishi M | 3 |
| Thomsen J | 3 |
| Yardley L | 3 |

**Table 7.** Main topics of top 100 articles

| Topic | No. of articles |
|---|---|
| Intratympanic gentamicin injection | 24 |
| Intratympanic steroid injection | 9 |
| Migraine and Meniére | 7 |
| Transtympanic micropressure treatment | 6 |
| Surgery | 6 |
| Electrocochleography | 6 |
| Endolymphatic hydrops | 5 |
| Vestibular myogenic potentials | 5 |
| Radiology | 4 |
| Pathophysiology | 4 |
| Inner ear microcatheterization | 4 |
| Quality of life | 4 |
| Genes | 3 |
| Otoimmunity | 3 |
| Psychology | 3 |
| Herpes simplex virus | 2 |
| Epidemiology | 2 |
| Others | 3 |

substantial amount of financial support given by the science committees. When the origins of the most cited articles are examined, following the United States, Japan ranks second with 11 articles and Germany is the third place with nine articles.

It is seen that 18 of these 100 articles, which have been cited most frequently about Meniere's disease, have been published in the Laryngoscope. Fifteen articles were published in Otology Neurotology, and 10 articles in Acta Otolaryngologica. These journals are very well known in the field of otolaryngology. Lancet's, a high-impact general science journal, having published a review on Meniere points out the importance of the Meniere's disease for the general scientific community.

When the authors of the 100 most cited Meniere's disease articles were examined, we saw that all famous researchers related to the subject were not mentioned. This can be explained by the fact that, such a listing, that is a sorting of articles only by the amount of citations, may not contain some well-known authors. This is also the case in bibliometric analysis articles on other topics.[12] Additionally, this database-supported study of Meniere's disease includes articles from 1975 and later years. Previous publications and developments in the history of Meniere's disease are not presented in the Table 1. Georges Portmann's first endolymphatic sac drainage operation at the end of the 1920s, and the realization of eighth neural neurectomy by Dandy around the same years, the endolymphatic subarachnoid shunt procedures being performed by William House in 1962, Kimura and Schuknecht's forming experimental hydrops in animal models in 1965 are all important milestones in the history and research studies of Meniere's disease.[2] This bibliometric analysis has limitations in defining these historical development processes and well-known authors. On the other hand, it provides the opportunity for a good recognition of current developments and accumulation of knowledge.

In conclusion, the analysis of the most frequently cited articles with the title of Meniere's disease, supported by the Web of Science database, helped us to identify the subjects that were being researched, the authors and the related centers. The results from this analysis provide a closer overview of the researches on Meniere's disease and present a current perspective on the studies to be done in the future.

**Declaration of conflicting interests**

The author declared no conflicts of interest with respect to the authorship and/or publication of this article.

**Funding**

The author received no financial support for the research and/or authorship of this article.

## REFERENCES

1. Atkinson M. Meniere's original papers reprinted with an English translation with commentaries and biographical sketch. Acta Otolaryngo (Stockh) 1961;162:1-78.
2. Sajjadi H, Paparella MM. Meniere's disease. Lancet 2008;372:406-14.
3. Ho YS, Hartley J. Classic articles in Psychology in the Science Citation Index Expanded: A bibliometric analysis. Br J Psychol 2016;107:768-780.
4. Gu W, Yuan Y, Yang H, Qi G, Jin X, Yan J. A bibliometric analysis of the 100 most influential papers on COPD. Int J Chron Obstruct Pulmon Dis 2015;10:667-76.
5. Joyce CW, Sugrue CM, Joyce KM, Kelly JL, Regan PJ. 100 citation classics in the melanoma literature: a bibliometric analysis. Dermatol Surg 2014;40:1284-98.
6. Tao T, Zhao X, Lou J, Bo L, Wang F, Li J, et al. The top cited clinical research articles on sepsis: a bibliometric analysis. Crit Care 2012;16:110.
7. Cao F, Li J, Li A, Fang Y, Li F. Citation classics in acute pancreatitis. Pancreatology 2012;12:325-30.
8. Seiber JN. "Citation classics" and classic citations in JAFC. J Agric Food Chem. 2010;58:1-3.
9. Aronson JK. Citation classics in the British Journal of Clinical Pharmacology, 1974-2003. Br J Clin Pharmacol 2004;58:699-702.
10. Khan MS, Ullah W, Riaz IB, Bhulani N, Manning WJ, Tridandapani S, et al. Top 100 cited articles in cardiovascular magnetic resonance: a bibliometric analysis. J Cardiovasc Magn Reson 2016;18:87.
11. Li Q, Jiang Y. Top classic citations in pancreatic cancer research. World J Surg Oncol 2016;14:298.
12. Qiang Li, Yuan Jiang. Top classic citations in pancreatic cancer research. World Journal of Surgical Oncology 2016;14:298.
13. Garfield E. 100 citation classics from the Journal of the American Medical Association. JAMA 1987;257:52-9.