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Short Communication

A scientometric study on research trends and characteristics of discoid lupus erythematosus

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Research characteristics

Abstract *Background/purpose:* Discoid lupus erythematosus (DLE) serves as an interdisciplinary disease involved in dermatology and stomatology in many cases. The purpose of this study was to analyze the scientometric characteristics and research trends of DLE.
Materials and methods: All the papers on DLE were comprehensively retrieved from the Scopus database. Discipline comparison (dermatology versus others) and chronological comparison (before 2005 versus 2005–2024) were performed, so that the number of papers can be to some extent compared in the analysis.
Results: Among all the 1239 papers on DLE, 738 (59.6 %) were published by dermatologists. Diagnosis aspect, skin manifestation, facial dermatoses, scar formation, hair loss, epiluminescence microscopy, dermoepidermal junction, arthralgia, anamnesis, young adult, Ro antibody, and dermoscopy were distinctive keywords for dermatologists; While Mouth mucosa, mouth diseases, lip neoplasms, eyelid disease, blepharitis, conjunctivitis, autoantibody, blood, neutrophil, fever, sex difference, preschool child were distinctive keywords for other scholars. Treatment response, dapsone, etretin, clobetasol, mycophenolate mofetil, glucocorticoid, triamcinolone, and drug safety were therapeutic keywords for dermatologists. Whereas quinacrine, alpha tocopherol, hydrocortisone, adverse drug reaction were therapeutic keywords for other scholars. The trend has changed to complication, disease duration, young adult, dermatitis, pruritus, antibody titer, Ro antibody, anamnesis, dermoscopy, arthralgia,

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dermoepidermal junction, keratosis, and African American, drug withdrawal, tacrolimus, mycophenolate mofetil, etretin, clobetasol, cyclophosphamide, and drug safety after 2005.
Conclusion: This scientometric study elucidated the current scenario and research trends of DLE, and would help in improving in reciprocal collaboration and communication for investigations on this disease.

Introduction

Discoid lupus erythematosus (DLE) is the most common type of cutaneous lupus erythematosus and can occur as a localized form (80 %) with lesions on the sun-exposed skin, such as scalp, face, and ears or as a disseminated form (20 %) with lesions above and below the neck.[1,2] Due to its scarring nature, prompt diagnosis and treatment of DLE is crucial. Diagnosis is made based on clinical findings being erythema, follicular plugging, dyspigmentation, telangiectasia, and skin atrophy.[3,4] Hyperpigmentation and scale extend into dilated hair follicles, causing follicular plugging. Skin atrophy, scarring, and scarring alopecia may result and thus seriously decrease quality of life. There are no drugs specifically approved for DLE therapy, but only for early treatment to reduce the symptoms. Thus, current therapies of DLE are challenging and not completely satisfactory, off-label, highly expensive, or poorly available.[2,3]

DLE patients are frequently seen in dermatological clinics, and the diagnosis and treatment of disease are mainly conducted by dermatologists. The diagnosis of DLE is usually made easily on clinical findings as described, most often above the sun-exposed head and neck and in some cases on lip and oral mucosa.[4,5] When the diagnosis is in doubt, a biopsy and histopathological examination may be required to confirm the diagnosis. DLE patients are at risk of developing squamous cell carcinoma in the scarred areas and lip and oral mucosa,[6,7] thus it is classified as a potentially malignant disorder by the World Health Organization.[8] Moreover, up to 28 % of patients with DLE are susceptible to developing systemic lupus erythematosus.[9] Therefore, when diagnosing and managing the refractory cases of DLE, the approach needs to be interdisciplinary collaboration including dermatologists, stomatologists, surgeons, and also specialists in clinical immunology and internal medicine.

Scientometrics is a useful tool that utilizes bibliometric and citation data to assess scientific output and research trend of a specific research field.[10] To accomplish a series of scientometric studies on oral potentially malignant disorders including oral submucous fibrosis,[11] oral leukoplakia and oral lichen planus,[12] this scientometric study aimed to investigate the research trends and characteristics of DLE publications.

Materials and methods

As per the methodology described previously,[11–14] all the papers on DLE in the Scopus database were retrieved on 18 Jun 2024. We used medical subject terms "discoid" and "lupus" and "erythematosus" in the Title in literature search, without restriction to paper type and year of publication. In clinical practice, dermatologists generally belong to the dermatology affiliation. Thus, the papers with the word "dermatology" in the affiliation generally represent scientific output of dermatologists, and the remaining papers generally represent scientific output of other scholars. The years of publication were divided into before 2005 and 2005—2024 (nearly 2 decades), so that the number of papers can be to some extent compared in the analysis of research trends.

The scientometric characteristics of all the eligible papers were reviewed and recorded for the following information: title, keyword, citation count, publication year, journal of publication, authorship, affiliation, and country/region of origin. Data search and extraction were performed independently by two investigators, and any discrepancy of results was resolved in a consensus symposium. Microsoft Office Excel 365 was used for index model building, and the Bibliometrix Biblioshiny R-package software was used for bibliometric statistics. In this descriptive study, variables are presented as numbers and percentages. No comparisons were made, and thus no *P*-values were set.

Results

Bibliometric characteristics of DLE publications

With the search strategy algorithm, a total of 1239 papers on DLE were retrieved in the Scopus database. There were 738 (59.6 %) and 501 (40.4 %) papers were published by dermatologists and other scholars, respectively. Fig. 1A illustrates the number and distribution of their paper types. The detailed information on publication year, title, journal, citation count, authors, keywords, document types, affiliations and countries/regions of all the papers on DLE are presented in Supplementary Table S1. Among the top-100 most-cited papers, 77 papers were contributed by dermatologists. To further concretize the trends of scientific output, we assessed the annual number of the papers and annual accumulated citations of the papers during 2005—2023 (Fig. 1B). The annual number of all the papers on DLE spirally changed from 21 to 31, and the accumulated citations of the papers changed from 486 to 494 during 2005—2023. The curves of annual number and accumulated citations of the papers by dermatologists were generally parallel to those of all the papers on DLE during this period.

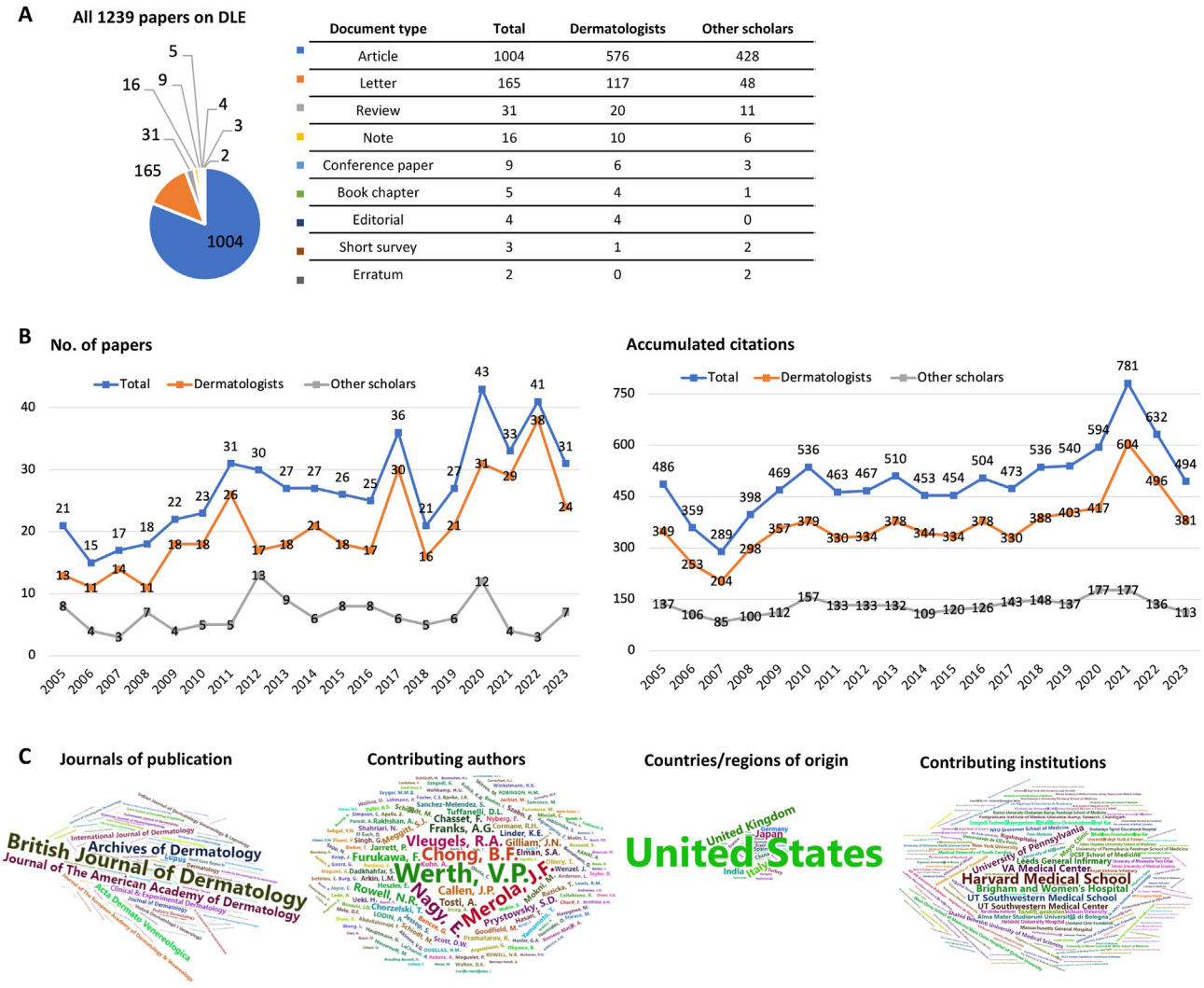

Figure 1 Bibliometric characteristics of the papers on discoid lupus erythematosus (DLE). (**A**) The types and numbers of the papers. (**B**) The annual number and accumulated citations of the papers during 2005–2023. (**C**) Cloud graphs of journal of publication, contributing authors, institutions, and countries/regions of origin. The font size indicates the number of papers; a larger size means more papers in the cloud graphs.

Moreover, the annual number and accumulated citations of the papers by dermatologists overwhelmingly exceeded these of the papers by other scholars. Fig. 1C displays cloud graphs of journals of publications, contributing authors, institutions, and countries/regions of origin. Table S2 presents the journals, contributing authors, institutions, and countries/regions with largest number of papers (rank, 1–10).

Research characteristics of DLE publications by dermatologists versus other scholars

Based on the frequency of keywords in all included papers, the keywords were automatically recognized in the order of highest to lowest frequency in the Scopus database. Fig. 2A displays cloud graph of all the keywords retrieved in the papers on DLE, with emphasis on the drugs for DLE (Fig. 2B). Common keywords, such as human tissue, systemic lupus erythematosus, histopathology, skin biopsy, pathology, immunology, antinuclear antibody, hydroxychloroquine, and corticosteroid were similar in the publications by dermatologists and other scholars. We highlight the analysis of distinctive research keywords (Fig. 2C). Concerning diagnostics, skin manifestation, skin atrophy, facial dermatoses, dermatitis, papule, scar formation, hair loss, sun exposure, epiluminescence microscopy, dermoepidermal junction, telangiectasia, hypopigmentation, arthralgia, anamnesis, young adult, Ro antibody, and dermoscopy were distinctive keywords for dermatologists. Mouth mucosa, mouth diseases, lip neoplasms, eyelid disease, blepharitis, conjunctivitis, autoantibody, blood, neutrophil, fever, sex difference, preschool child were distinctive keywords for other scholars. Treatment response, dapsone, etretin, clobetasol, mycophenolate mofetil, glucocorticoid, triamcinolone, and drug safety were therapeutic keywords for dermatologists. Quinacrine, adrenal cortex hormones, alpha tocopherol, hydrocortisone, adverse drug reaction

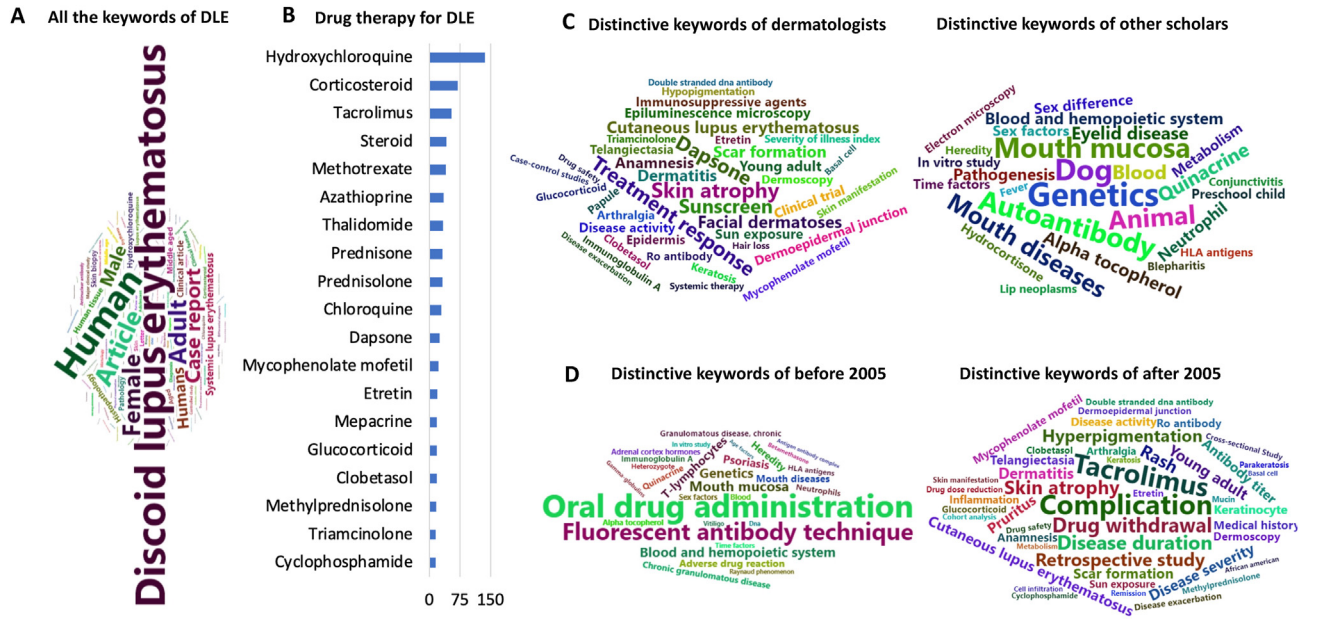

Figure 2 Research characteristics of the papers on discoid lupus erythematosus (DLE). (**A**) Cloud graph of all the keywords. (**B**) The including drugs for DLE. Cloud graphs of (**C**) distinctive keywords of papers by dermatologists and other scholars, and (**D**) distinctive keywords of papers published before 2005 and after 2005. The font size indicates the number of papers; a larger size means more papers in the cloud graphs.

were therapeutic keywords for other scholars. Besides, clinical trial and case-control studies were mainly conducted by dermatologists; While the research on genetics, heredity, HLA antigens, animal, and in vitro study were mainly conducted by other scholars.

Research trends of DLE publications before 2005 versus after 2005

There were 709 papers published before 2005 and 530 papers published after 2005. There have always been the same common keywords such as human tissue, pathology, histology, Autoimmune disease, systemic lupus erythematosus, clinical feature, hydroxychloroquine, and corticosteroid. The more common keywords in different years can basically reflect research trends (Fig. 2D). Before 2005, mouth mucosa, mouth diseases, fluorescent antibody technique, T-lymphocytes, neutrophils, blood, immunoglobulin A, gamma-globulins, psoriasis, chronic granulomatous disease, sex factors, time factors, age factors, Raynaud phenomenon, and vitiligo were distinctive keywords of diagnostics. Oral drug administration, adverse drug reaction, quinacrine, adrenal cortex hormones, alpha tocopherol, and betamethasone were therapeutic keywords. Meanwhile, the research on genetics, heredity, HLA antigens, heterozygote, and in vitro study were mainly conducted before 2005. After 2005, complication, disease duration, skin atrophy, rash, hyperpigmentation, young adult, dermatitis, pruritus, scar formation, antibody titer, Ro antibody, telangiectasia, anamnesis, dermoscopy, sun exposure, arthralgia, dermoepidermal junction, keratosis, parakeratosis, skin manifestation, and African American were distinctive keywords of diagnostics. Drug withdrawal, drug safety, drug dose reduction, tacrolimus, mycophenolate mofetil, etretin, glucocorticoid, methylprednisolone, clobetasol, and cyclophosphamide were therapeutic keywords. Meanwhile, retrospective study, cross-sectional study, and cohort analysis were mainly conducted after 2005.

Discussion

The previous bibliometric/scientometric analyses of lupus erythematosus focus on many aspects of systemic lupus erythematosus,[15–18] with no relevant study on cutaneous lupus erythematosus. DLE as the most common type of cutaneous lupus erythematosus represents 80 % of the cases. In this scientometric study, we provided a comprehensive analysis of scientometric characteristics and research trends of the publications on DLE. This study will help in evaluating the historical citation and bibliometric characteristics in the field of DLE that has undergone scientific evolution over the past decades. The diagnosis and treatment of DLE in many cases need be interdisciplinary, mostly dermatology. Dermatologists contributed to about 60 % of the total number of papers and 77 of 100 most-cited papers on DLE, because the patients are frequently seen in dermatological clinics and the diagnosis and treatment are mainly conducted by dermatologists.

The research keywords can reflect the directions and concerned topics of research. For instance, skin manifestation, dermatitis, dermoscopy, and dermoepidermal junction were more frequently mentioned by dermatologists; While mouth mucosa, mouth diseases, lip neoplasms, eyelid disease, blepharitis, and conjunctivitis were more

common in DLE publications by other scholars. Notably, the trend of drug research for DLE has changed to drug withdrawal and safety, tacrolimus, mycophenolate mofetil, etretin, clobetasol, and cyclophosphamide after 2005. It should be noted that data regarding the treatment of DLE is limited largely to case reports, small case series, and retrospective or open-label studies of a small number of cases. No drugs for DLE have been approved specifically, and many described in literature were developed for use in other autoimmune disorders. New potential therapies, particularly emerging biologic agents, may benefit from large randomized and controlled clinical trials as well as from clinical evaluation by a standardized objective measure that will allow comparison between studies.

In summary, this scientometric study elucidated the current scenario and research trends of DLE. Finding the scientometrics would elucidate the comprehensive identification and recognition of the important and relevant research topics concerned, but also help in improving in reciprocal collaboration and communication for investigations on this disease.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jds.2024.10.003.

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