

Global Research Trends and Disparities in Cesarean Section-Related Placenta Accreta Spectrum Disorders: A 93-Year Bibliometric Analysis

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AIM: Placenta accreta spectrum disorders (PASD) complicate 1 in 2500 deliveries globally, with incidence rising parallel to a 31% increase in cesarean section (CS) rates over three decades. This bibliometric analysis maps 93 years (1933–2025) of CS-PASD research to identify collaboration gaps and prioritize solutions focused on equity.

METHODS: Articles concerning CS and PASD from 1933 to early 2025 were retrieved from the Web of Science Core Collection. A bibliometric analysis was conducted using VOSviewer, CiteSpace, and R- Bibliometrix to evaluate co-authorship networks, institutional collaborations, and keyword co-occurrence patterns.

RESULTS: A total of 758 articles were identified, with an average annual growth rate of 2.64%. Contributions came from 57 countries/regions and involved 3814 authors, with the USA and UK leading in citations. Notable institutions included Sichuan University and University of California System. Key journals included the *American Journal of Obstetrics and Gynecology* and *Obstetrics & Gynecology*. Key contributors included Takahashi Hironori (9 articles) and Liu Xinghui (highest collaboration frequency, Total Link Strength (TLS) = 24), with emerging networks centered on Chinese and European institutions. Key keywords included “placenta accreta spectrum”, “prior cesarean section”, “ultrasound diagnosis”, and “Fédération Internationale de Gynécologie et d’Obstétrique (FIGO) guidelines”, reflecting major research themes in PASD management. Trends highlighted advancements in diagnostic standardization, such as artificial intelligence (AI)-enhanced placental magnetic resonance imaging (MRI), multidisciplinary care models, and AI-driven risk stratification. Additionally, disparities in global resource allocation underscored the need for equitable healthcare interventions.

CONCLUSIONS: Research on CS-PASD has evolved into a multidisciplinary issue, facilitated by advancements in imaging technologies and collaborative efforts. Future investigations should prioritize the integration of AI diagnostics, the development of cost-effective preventive strategies, and the establishment of standardized protocols to enhance maternal safety and mitigate healthcare inequities.

Keywords: cesarean section; placenta accreta spectrum disorders; bibliometric analysis; multidisciplinary management; ultrasound diagnosis; peripartum hysterectomy; risk stratification; FIGO guidelines

Introduction

Placenta accreta spectrum disorders (PASD), encompassing placenta accreta, increta, and percreta, represent serious obstetric complications characterized by abnormal placental invasion into the myometrium and surrounding tissues. These conditions can result in severe hemorrhage, maternal morbidity, and elevated rates of peripartum hysterectomy [1,2]. The global incidence of PASD has significantly increased in recent decades, correlating with rising cesarean section (CS) rates, advancing maternal age, and an increase in uterine surgical interventions [3,4]. Current estimates indicate that PASD complicates approximately 1 in 2500 deliveries, with prevalence rates exceeding 10% among high-

risk populations, such as those with placenta previa or previous uterine scarring [5,6].

Cesarean delivery is the most significant independent risk factor for PASD, with the risk markedly increasing with each successive procedure. Clark *et al.* [5] first established this association in 1985, reporting a 10% incidence of placenta accreta in patients with placenta previa and four or more prior cesarean deliveries. Subsequent studies have corroborated these findings, with Miller *et al.* [1] indicating a 39% risk of PASD in patients with anterior placenta previa and two or more cesarean deliveries. The underlying biological mechanism involves defective decidualization at sites of uterine scarring, facilitating trophoblastic invasion into myometrial defects [7,8]. Histopathological analyses reveal that PASD placentas exhibit direct villous adherence to scarred myometrium, devoid of intervening decidua, and demonstrate abnormal vascular remodeling [7].

Advancements in diagnostic modalities have been pivotal in mitigating PASD-related morbidity. Ultrasound serves as the primary screening tool, with critical indicators including

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placental lacunae, the loss of the retroplacental clear zone, and abnormal uterovesical vascularity [9,10]. Finberg and Williams [9] established systematic ultrasound criteria in 1992, achieving a sensitivity of 93% for the detection of PASD through assessments of myometrial thinning and placental heterogeneity. Magnetic resonance imaging (MRI) complements ultrasound, particularly in complex cases, revealing characteristic findings such as uterine bulging and dark intraplacental bands on T2-weighted sequences [11]. Despite these advancements, it is estimated that up to 70% of PASD cases remain undiagnosed antenatally, underscoring ongoing challenges in risk stratification and imaging interpretation [4].

The management of PASD has evolved toward multidisciplinary care models emphasizing planned preterm cesarean hysterectomy. Silver [3] underscored the significance of timing delivery (between 34 and 36 weeks) and preoperative measures such as ureteral stenting and cell salvage systems. Conservative approaches, including techniques for uterine preservation and methotrexate therapy, remain contentious due to the associated risks of delayed hemorrhage and sepsis [2]. Recent guidelines from the International Society for Abnormally Invasive Placenta (IS-AIP) emphasize the necessity of institutional protocols, preparedness for massive transfusion, and the availability of hybrid operating rooms [12].

The association between cesarean delivery and PASD is well-documented; however, significant gaps in knowledge persist concerning optimal prevention strategies, long-term reproductive outcomes, and biomarkers for early detection. Gusenbauer M and Haddaway NR (2020) [13] underscores the critical role of database selection in bibliometric research, asserting that the Web of Science (WOS) database provides superior interdisciplinary coverage, enhanced accuracy in citation tracking, and improved duplicate removal compared to alternative databases such as Scopus or Google Scholar. These technical advantages render WOS an invaluable resource for conducting reliable analyses in medical research, particularly for tracing multidisciplinary research trajectories within PASD studies [14]. Bibliometric analysis, a quantitative approach for delineating scientific landscapes, offers critical insights into research trends, author collaborations, and the evolution of knowledge structures within specific domains [15]. In recent decades, there has been a significant increase in scholarly interest in PASD, as evidenced by a rising volume of publications in the fields of obstetrics, radiology, and surgery. Nevertheless, the synthesis of findings across these disciplines continues to be fragmented [16,17]. This study employs a curated dataset and the citation network precision of the WOS to implement bibliometric methodologies in three distinct ways: (1) tracing the two-decade evolution of research linking cesarean delivery to the pathogenesis of PASD, (2) identifying global collaborative networks that are instigating paradigm shifts, and (3) illuminating emerg-

ing diagnostic and therapeutic avenues through keyword co-occurrence and burst detection analyses.

Materials and Methods

Data Source and Search Strategy

A systematic literature search was conducted utilizing the Web of Science Core Collection (WoSCC), a globally acknowledged database distinguished for its stringent curation of high-impact scholarly journals across diverse disciplines [18]. The search, executed on 23 March 2025, encompassed publications indexed from 1 January 1933 to 23 March 2025. The search strategy was designed to investigate the association between CS and PASD, employing the following query: (TS = ("placenta accreta spectrum disorder*" OR "PAS disorder*" OR "placenta accreta" OR "placenta increta" OR "placenta percreta")) AND (TS = ("caesarean section*" OR "cesarean section*" OR "CS delivery" OR "CS procedure*")). To ensure methodological rigor, the search excluded non-relevant document types using the operator: NOT TS = ("review" OR "meeting abstract" OR "editorial material" OR "proceeding paper" OR "early access" OR "note" OR "correction" OR "retracted publication") (TS, Topic; PAS, Placenta accreta spectrum). Only original research articles published in English were included in the analysis. Two independent reviewers conducted the literature screening and data extraction. Discrepancies were addressed through discussion, and in cases where consensus could not be achieved, a third reviewer was consulted. Bibliographic records, complete with full metadata and cited references, were exported in plain text format. Extracted data included publication years, citation counts, author affiliations, and institutional and national/regional contributions, as well as keywords and journal metrics. The original data are detailed in the **Original Data**. The supplementary data refer to **Supplementary Table 1**.

Statistical Analysis and Visualization

To comprehensively characterize the academic landscape of research in CS-PASD, we employed three complementary bibliometric tools: VOSviewer (version 1.6.20, Leiden, South Holland, Netherlands), CiteSpace (version 6.4.R, Philadelphia, PA, USA), and the R-based package Bibliometrix (version 4.3.3, Naples, Campania, Italy). Each tool offers distinctive analytical advantages:

VOSviewer was primarily utilized to construct and visualize collaborative networks. It generated spatial node-link diagrams to map co-authorship patterns among institutions and authors, as well as to identify keyword co-occurrence clusters [19]. In these visualizations, the size of nodes represented publication frequency, color indicated cluster affiliation, and link strength reflected collaboration intensity. This methodology facilitated the identification of key contributors, institutional partnerships, and dominant thematic clusters within the CS-PASD domain.

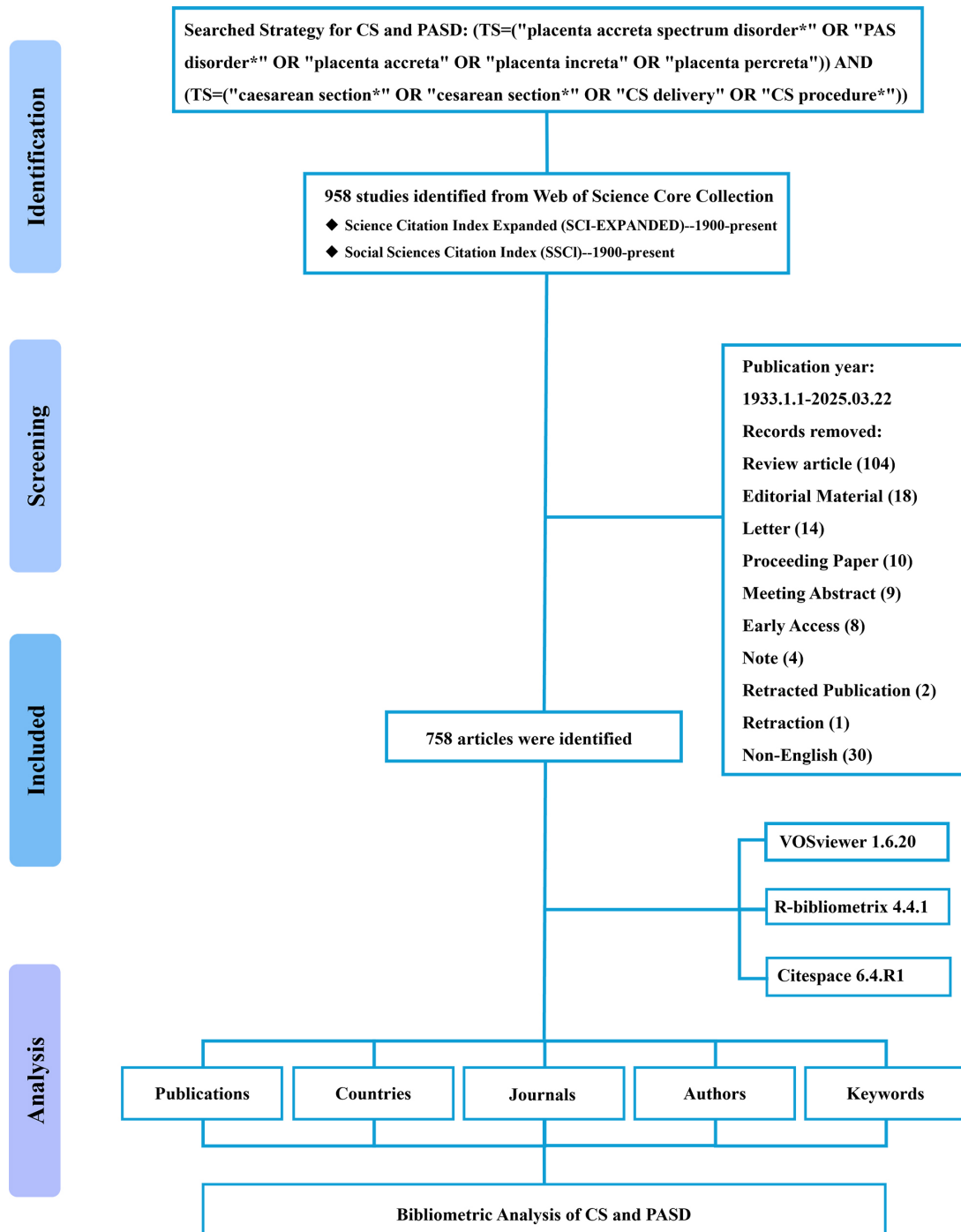


Fig. 1. Flowchart of the data screening process. CS, cesarean section; PASD, placenta accreta spectrum disorders; TS, Topic; PAS, Placenta accreta spectrum.

CiteSpace focused on analyzing temporal and structural dynamics. It identified burst keywords to unveil emerging research fronts and calculated betweenness centrality to highlight pivotal studies that link distinct thematic domains [20]. CiteSpace examined literature from 1933 to 2025, applying pruning algorithms (e.g., pathfinder and clipping) to simplify network structures for enhanced interpretability. The burst detection algorithm identified keywords that experienced sudden frequency increases, signifying conceptual

advancements, while centrality metrics assisted in identifying structurally influential publications.

Bibliometrix offered quantitative benchmarking and geographic insights. This tool was employed to conduct trend analysis over time and generate geographical maps of research productivity [21,22]. It visualized country-level contributions, tracked the evolution of keyword prominence, and mapped conceptual relationships through co-word analysis. Node sizes indicated term frequency, while

edge links represented co-occurrence strength, thereby providing a spatial-temporal perspective on research output and thematic development.

By integrating these methodologies—network topology analysis from VOSviewer, temporal pattern detection from CiteSpace, and spatial productivity mapping from Bibliometrix—we ensured methodological rigor in delineating the intellectual structure, collaborative networks, and emerging research priorities within CS-PASD scholarship [23]. **Supplementary Table 1** provides a comprehensive summary of the definitions, calculation methodologies, and interpretive thresholds associated with the bibliometric indicators employed in this study.

Results

Overview of Publications and Trends

From 1933 to 2025, research on the CS and PASD has demonstrated a steady increase, with a total of 758 articles published during this period, corresponding to an annual growth rate of 2.64%. The data screening process is illustrated in Fig. 1, which details the selection and exclusion of records. These studies were authored by 3814 researchers from 814 institutions across 57 countries/regions and were published in 178 different journals. The analysis included contributions from multiple authors, with a significant proportion of publications resulting from international collaborations, accounting for 8.84% of all studies. The average number of co-authors per document was 5.8, while only 21 publications were single-authored. The included publications collectively cite 9105 references, reflecting the breadth of research in this domain. A total of 1195 unique author keywords were identified, illustrating the diversity of topics explored within this research field. Each document received an average of 24.8 citations, highlighting the substantial academic influence of the work. Additionally, the average document age was 9.98 years, indicating that foundational studies in this field have maintained relevance over time (Fig. 2B).

Fig. 2A includes three elements illustrating the evolution of academic output. The orange bar graph shows annual publication counts, while the blue curve and dashed line depict cumulative articles and their exponential growth. From 1983 to the early 2000s, annual publications were below 10, with particularly low outputs from the 1940s to the 1960s. A significant increase began around 2008, peaking at 75 articles in 2021 and 2022, then declining to 63 in 2024. The exponential growth curve, defined by the equation $y = 0.7876 \times 10^{0.066x}$, exhibits a high coefficient of determination (R^2) value of 0.9588. This suggests a substantial accelerating trend in the scale of research, characterized by an annual growth rate of 6.6% since 2008. The chart's dual-axis design highlights global research engagement over 98 years (1933–2025), with contrasting colors distinguishing annual counts from long-term trends. To address potential concerns regarding temporal heterogeneity,

we conducted sensitivity analyses comparing two distinct timeframes: the comprehensive period from 1933 to 2025 and the modern research era spanning from 1990 to 2025. The exponential growth model for the latter timeframe ($y = 18.955 \times 10^{0.1082x}$, $R^2 = 0.9866$) demonstrates a superior model fit relative to the full-scope model, thereby confirming a significant escalation in research activity post-1990 (**Supplementary Fig. 1**).

Analysis of Leading Countries

The global distribution of publications within this field reveals substantial contributions from 57 countries. As illustrated in Fig. 3A, China leads the publication count with 188 articles, followed by the USA with 107 articles and Japan with 66 articles. Other significant contributors include the United Kingdom (44 articles), Turkey (39 articles), and Italy (24 articles). Notably, despite constituting 24.8% of total research articles, China demonstrates a comparatively low international collaboration ratio, with a mere 3.7% Multiple-Country Publication (MCP) rate. This observation suggests a predominant emphasis on domestic research partnerships within the country. In contrast, the United Kingdom and Israel exhibit significantly higher rates of international collaboration, with MCP ratios of 34.1% and 25%, respectively, indicating a strategic focus on global scientific partnerships. As illustrated in Fig. 3B, 11 countries exhibit high betweenness centrality (>0.1), ranked in descending order: United Kingdom, Netherlands, France, Belgium, and Argentina. Fig. 3C presents a VOSviewer-generated network map that depicts international research collaborations among 30 countries. In this visualization, the size of each node represents its Total Link Strength (TLS), while the colored lines denote the intensity of collaborative relationships. Notably, the United Kingdom, Belgium, and the Netherlands constitute a central collaborative hub, with the United Kingdom positioned at the core, underscoring its role as a pivotal global connector.

Thematic and Paradigmatic Functions of Institutions

Fig. 4A illustrates the research productivity of leading institutions and highlights their evolving thematic focus within the clinical management of CS-PASD. Chinese institutions such as Sichuan University and Zhengzhou University make significant contributions to interventional strategies, particularly in uterine artery embolization and conservative treatment, reflecting China's emphasis on hemorrhage management protocols. Conversely, the University of California System and Harvard University prioritize diagnostic innovations, including imaging-based classification systems and artificial intelligence-assisted prenatal risk prediction. Fig. 4C illustrates the temporal publication trends of major academic institutions. Zhengzhou University (green line) has experienced significant growth since 2013, with its annual publication output increasing from nearly zero to approximately 28 publications by 2023,

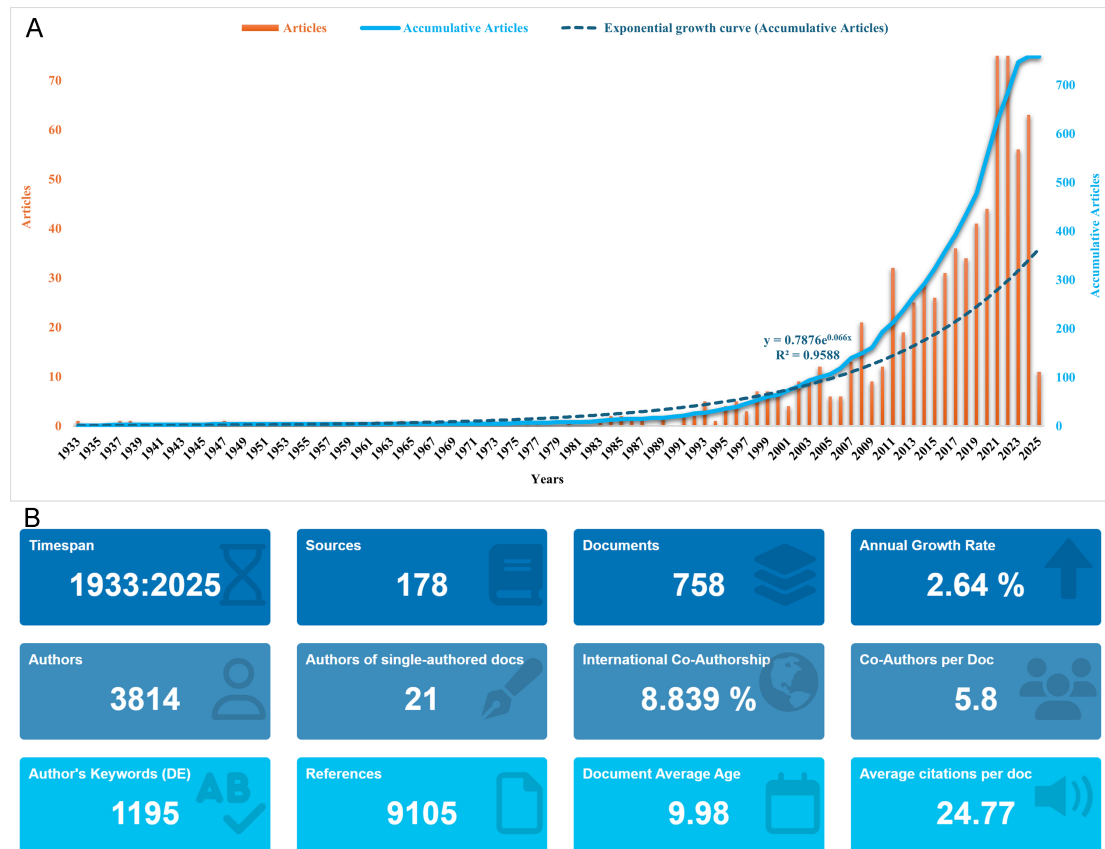


Fig. 2. Trends in publications on CS and PASD research. (A) Annual publication trends and growth (1933–2025). (B) Overview of publications from Bibliometrix.

thereby surpassing historically prominent institutions such as Chongqing Medical University. Both Sichuan University (blue line) and Chongqing Medical University (purple line) have demonstrated moderate yet consistent increases, achieving roughly 40 and 25 publications, respectively, by 2023. These trends underscore the evolving roles of institutions in CS-PASD research, with Zhengzhou University emerging as a preeminent contributor in recent years.

The collaborative network (Fig. 4B) introduces an additional layer of interpretive depth. Shandong University and ARNAS Civic Hospitals Di Cristina emerge as central hubs within thematic clusters focused on surgical protocols and post-cesarean hemorrhage control. Their partnerships with institutions such as Stanford University and National Taiwan University indicate active cross-national engagement in evidence-based standardization practices. These networks facilitate a broader paradigm shift from reactive surgical interventions to structured, risk-stratified management of PASD.

Journals as Thematic and Paradigmatic Vectors

Fig. 5A,B illustrate the publication activity across prominent journals, revealing a thematic emphasis on maternal-fetal medicine and obstetric imaging. Journals such as *The Journal of Maternal-Fetal & Neonatal Medicine* and

BMC Pregnancy and Childbirth serve as central platforms for translational research, increasingly disseminating studies on protocols, Fédération Internationale de Gynécologie et d'Obstétrique consensus guidelines, and imaging-driven surgical planning. These elements exemplify the emerging paradigm of preoperative risk stratification and conservative management.

Moreover, journals like *Ultrasound in Obstetrics & Gynecology* and *Radiology* function as essential conduits between clinical imaging and surgical decision-making, facilitating the implementation of AI-based diagnostic frameworks. This is further evidenced in Fig. 5C, where the high betweenness centrality of *American Journal of Obstetrics and Gynecology* and *Radiology* underscores their role in integrating disparate subfields into cohesive research clusters, particularly those centered on precision imaging, hemorrhage risk prediction, and minimally invasive approaches. Additionally, regional journals such as *Acta Obstetrica et Gynecologica Scandinavica* and *Australasian Journal of Obstetrics and Gynaecology* contribute to the development of context-specific clinical protocols, reinforcing a global trend toward locally adapted yet internationally informed PASD care strategies. Although the dataset includes publications indexed through March 2025, the x-axis in Fig. 4C,5B is displayed only up to 2023. This is due to the

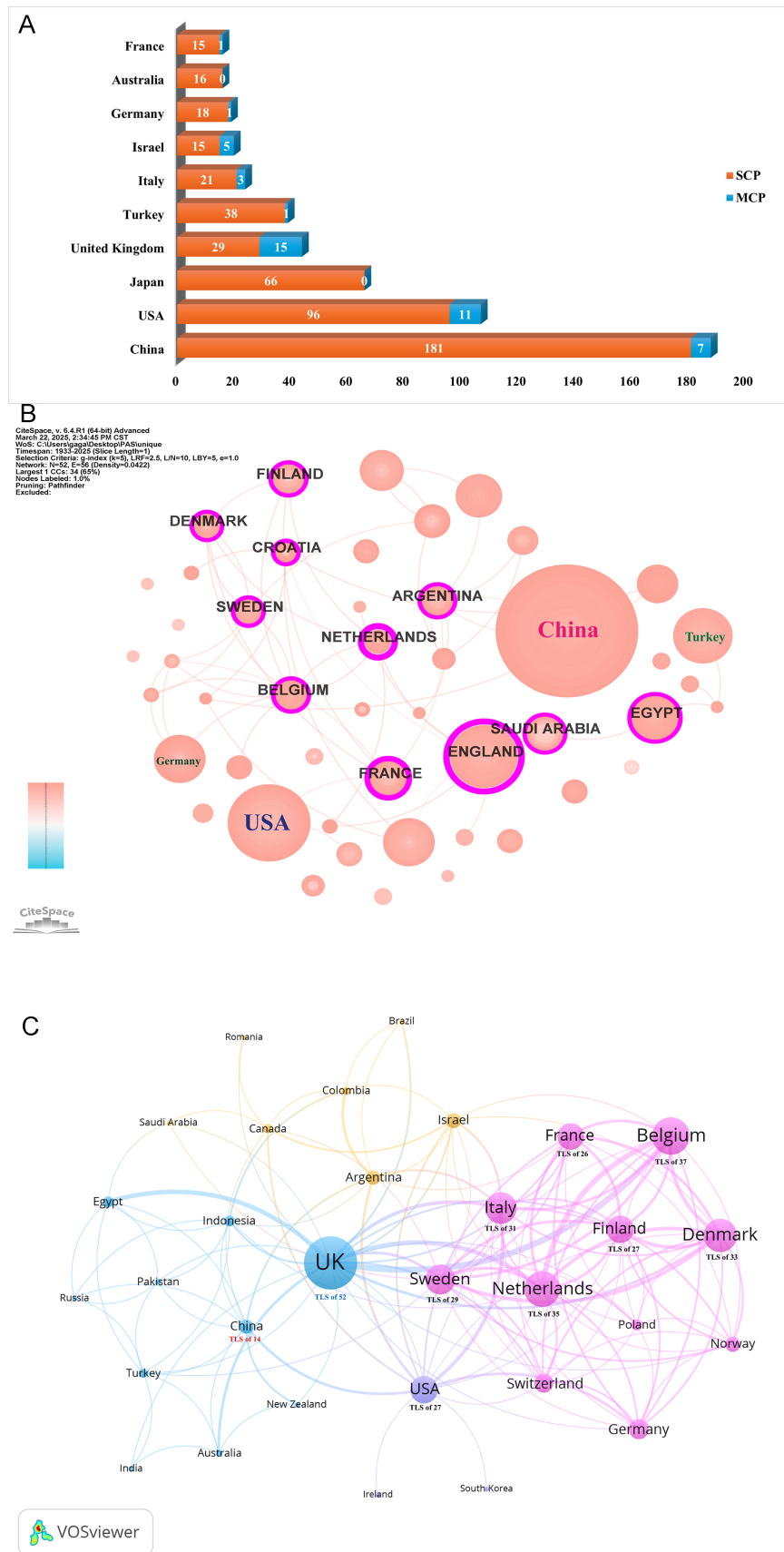


Fig. 3. Global distribution and collaboration in CS and PASD research. (A) Leading countries by publication outputs. (B) Collaboration map among countries. (C) Global collaboration network. SCP, Single Country Publications; MCP, Multiple Country Publications.

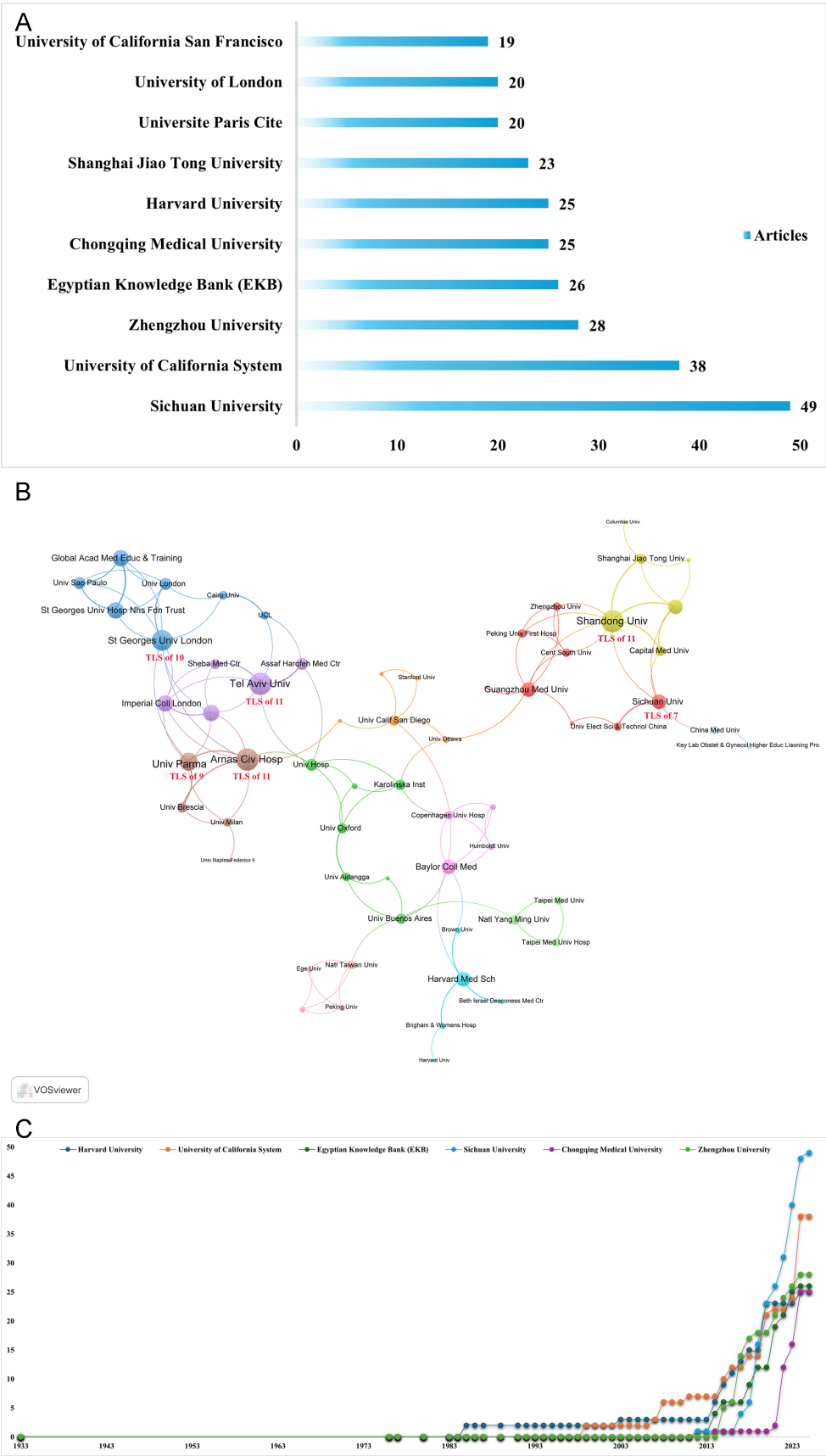


Fig. 4. Longitudinal trends and institutional contributions. (A) Top 10 institutions by article count. (B) Institutional collaboration network. (C) Multi-line temporal trend chart.

visualization software's default behavior of labeling only complete calendar years, ensuring visual consistency and minimizing bias from partial-year data.

Analysis of Authors

A total of 3814 authors have made contributions to this field. Takahashi, Hironori occupies the foremost position with a total of 9 published articles (Fig. 6A). In terms of collaboration and network influence (Fig. 6B), Liu, Xinghui demonstrates the highest frequency of collaboration, evidenced by a Total Link Strength of 24. Furthermore, researchers such as Tian, Yuan, and Zhang, Weishe also exhibit notable collaborative engagement within the network. However, when evaluating all relevant factors, Liu, Xinghui emerges as the most influential scholar in this domain, demonstrating considerable academic impact and leadership within these collaborative networks.

Keyword Clusters and Clinical Paradigms

Fig. 7A presents a triadic cluster model that closely aligns with pivotal clinical paradigms: (1) Placental Abnormalities and Imaging: Keywords such as “placenta accreta”, “ultrasonography”, and “MRI features” converge around the diagnostic paradigm, emphasizing the significance of early detection and precise localization. This cluster also incorporates AI-related terminology, including “accuracy” and “classification”, indicative of a growing reliance on algorithm-enhanced decision-making tools. (2) Interventional and Hemorrhage-Control Strategies: Terms such as “balloon occlusion”, “arterial embolization”, and “cesarean hysterectomy” reflect a trend towards conservative, uterus-preserving approaches, particularly for women desiring to maintain fertility. These keywords are closely associated with transformative research, notably from China and Europe. (3) Guideline-Based Management and Risk Factors: Key terms such as “FIGO consensus”, “conservative treatment”, and “risk assessment” signify the formalization of clinical practice into structured, evidence-based pathways. The recent emergence of terms like “natural history” and “standardization” underscores a shift towards longitudinal outcome tracking and protocol-based decision trees. The burst term analysis presented in Fig. 7B further substantiates this evolution. Initial terms such as “postpartum hysterectomy” and “uterine rupture” have transitioned to “placenta accreta spectrum”, “FIGO consensus guidelines”, and “severe postpartum hemorrhage”, highlighting a distinct paradigmatic shift—from emergency surgical intervention to risk-managed, imaging-guided, and protocol-driven care. The temporal evolution of keywords such as “Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA)”, “uterine preservation”, and “artificial intelligence” reflects substantial clinical, technological, and geopolitical developments. For example, the increase in AI-related terminology post-2020 aligns with the accelerated digitalization of diagnostic workflows and heightened investment in health

technology innovation, particularly within Europe and East Asia. Similarly, the rising prevalence of terms associated with conservative surgical management signifies a transformation in the treatment protocols for PASD, driven by global concerns regarding fertility preservation and surgical morbidity. These trends suggest that the shifts in research topics are not merely bibliometric artifacts; rather, they are influenced by evolving clinical demands, technological advancements, and regional health policy priorities.

Discussion

This bibliometric analysis delineates the growth trajectory of research pertaining to PASD and identifies distinct yet interconnected research domains through the convergence of institutional affiliations, journal publications, and keyword usage. For instance, institutions such as Sichuan University and the University of Southern California have made substantial contributions to research clusters centered on surgical standardization and diagnostic imaging, supported by both author output and prominent keywords such as “placental lacunae” [10], “bladder wall invasion” [9], and “cesarean hysterectomy” [3,12]. This convergence signifies an evolution in PASD research from exploratory case studies to protocol-driven methodologies, with specific institutions functioning as intellectual hubs that facilitate the integration of clinical application and methodological refinement. The research focus has shifted over time from descriptive case series to standardized surgical procedures and advanced imaging protocols. This shift can be attributed to the growing clinical burden of PASD, improvements in diagnostic criteria, and advancements in prenatal imaging technology. Together, these factors have created a demand for more structured research, driving the transition toward high-impact, guideline-driven studies.

Importantly, the clustering of journals corresponds with these clinical focal areas. The *Journal of Maternal-Fetal & Neonatal Medicine* is a leading publisher of studies concerning standardized surgical techniques and imaging-based diagnoses, thereby providing a specialized platform for the consolidation of translational advancements. In contrast, broader journals such as *Ultrasound in Obstetrics and Gynecology* act as interdisciplinary channels, reflecting a growing interest in integrative technologies, including artificial intelligence [2,23]. The emergence of AI as a prominent research topic around 2019 coincides with global advancements in machine learning algorithms, enhancements in imaging hardware, and increased funding for computational obstetrics. These external technological developments and policy changes have significantly impacted keyword trends and reshaped research directions.

Linking Research Actors to Evolving Clinical Paradigms

By synthesizing author productivity, institutional focus, and journal preferences, a more nuanced understanding of thematic evolution emerges. For example, highly cited

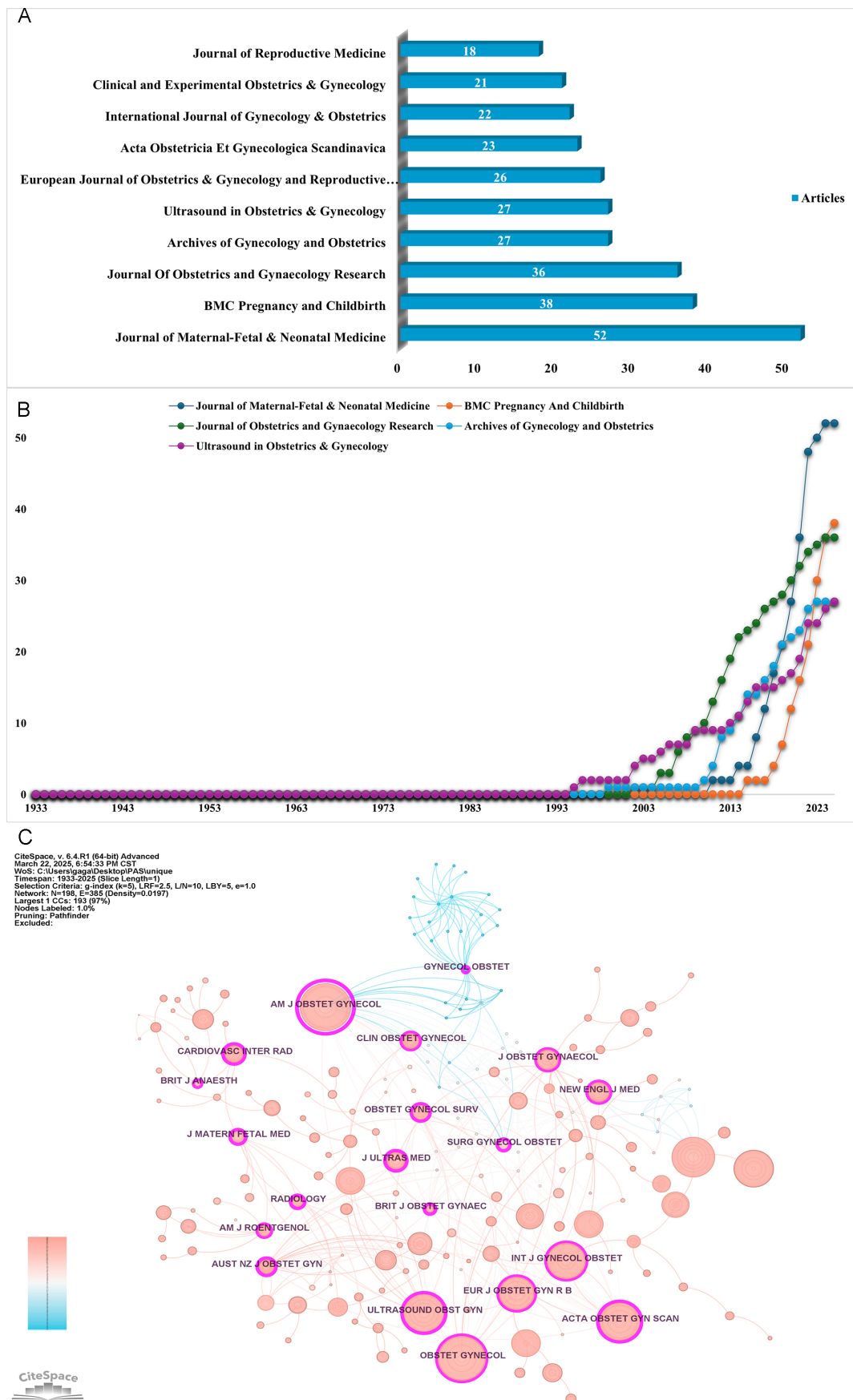


Fig. 5. Network analysis of journals in CS and PASD research. (A) Leading journals by output. (B) Leading journals by trend. (C) Journal co-occurrence network.

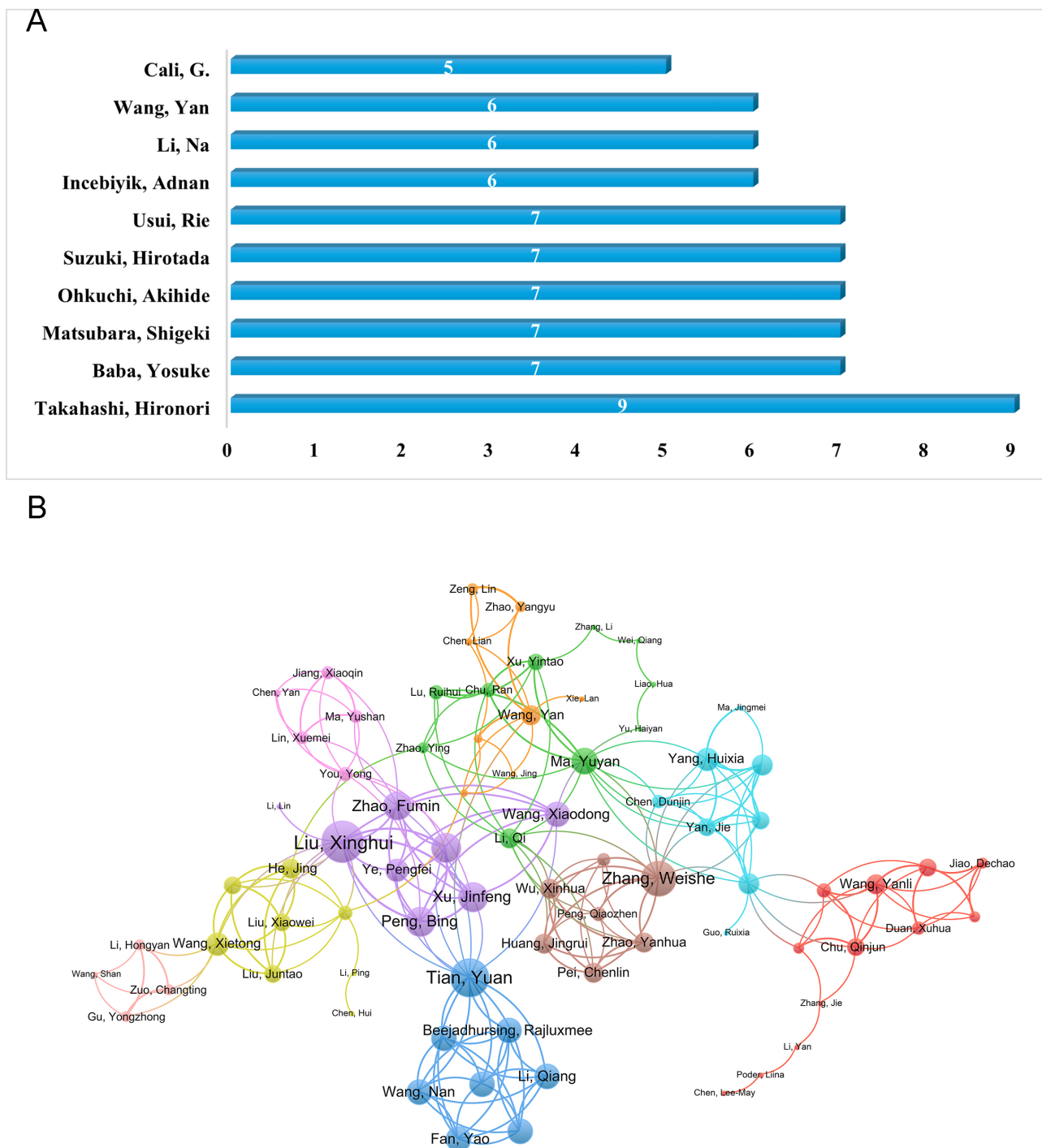


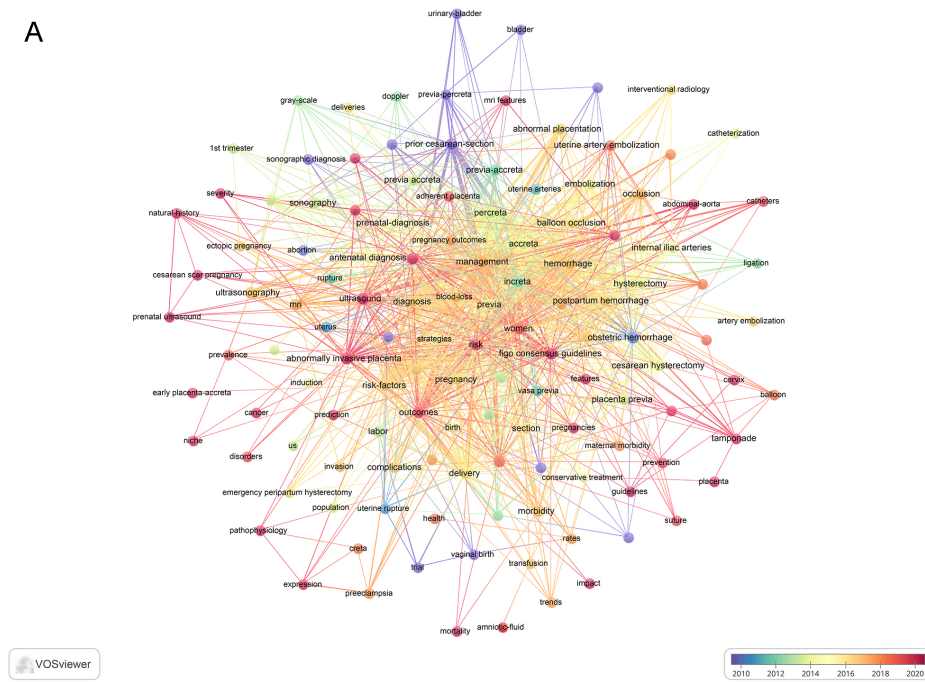
Fig. 6. Analysis of authors. (A) Leading authors by output. (B) Author collaboration network.

authors such as Silver and Jauniaux are prolific and pivotal in shaping and disseminating new clinical paradigms—particularly in the domains of prenatal diagnosis protocols and surgical staging systems [3,8]. Their contributions span high-impact journals and keyword clusters (e.g., “REBOA” [12], “uterine preservation” [24,25]), thereby establishing a thematic linkage between evidence generation and clinical consensus. The adoption of these themes often coincided with key clinical milestones, such as the publication of na-

tional management guidelines or the introduction of new surgical tools. This emphasizes how policy developments and clinical needs shape academic focus.

Furthermore, the integration of artificial intelligence into placental imaging—evident through the emergence of new keywords and concentrated journal outputs—marks a significant frontier in research. Authors affiliated with European consortia and Israeli universities are at the forefront of pioneering machine learning applications for MRI anal-

A



B

Top 50 Keywords with the Strongest Citation Bursts

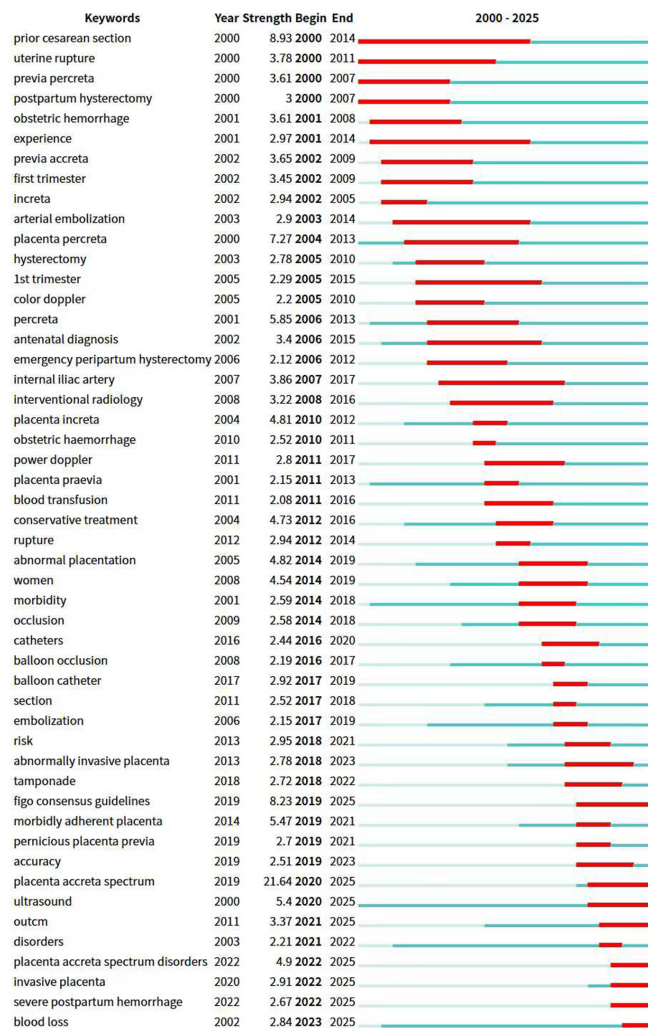


Fig. 7. Analysis of keywords. (A) Keyword co-occurrence network. (B) Keywords citation burst analysis.

ysis [23], while researchers in East Asia are advancing early pregnancy modeling and AI-assisted 3D Doppler studies [8]. This geographic diversity underscores the globalization of technological innovation, despite historically Western-dominated authorship patterns.

Research Silos and Knowledge Translation

Despite observable thematic convergence, the field remains fragmented along clinical specialty lines, with surgical, diagnostic, and epidemiologic research often developing independently rather than in an integrative manner. For instance, while imaging technologies such as T2-weighted MRI and Doppler ultrasound are essential for diagnosis [9,16], their application in surgical planning protocols is inconsistently documented throughout the literature. This division is mirrored in journal silos: surgical studies are typically published in obstetric-surgery-specific journals, whereas diagnostic innovations appear in imaging-focused publications, thereby hindering cross-disciplinary learning. To mitigate this fragmentation, future bibliometric studies could investigate co-citation or bibliographic coupling across silos to identify potential thematic connections. For example, author clusters that bridge imaging and surgical publications could serve as translational catalysts, promoting integrated guidelines that align with real-world patient pathways. The delayed integration of imaging into surgical planning is partly due to the uneven pace at which technological innovations are adopted in clinical workflows. This adoption is influenced by institutional policies, access to imaging infrastructure, and varying training approaches among clinicians. Such institutional differences help explain the asynchronous emergence of specific themes in the literature.

Toward a Thematic Synthesis of PASD Research

Ultimately, the interplay among journal output, institutional leadership, and keyword evolution illustrates a field transitioning from descriptive fragmentation to thematic synthesis. This transition is particularly evident in the increasing standardization of the term “placenta accreta spectrum”, which denotes consensus-building efforts across diverse regions and clinical domains (burst strength: 21.64, 2020–2025). The growing prominence of collaborative networks among the United Kingdom, Belgium, and Asian centers further underscores a shift from isolated national practices to shared global frameworks—especially concerning surgical preparedness, imaging criteria, and interventional thresholds [12].

This convergence reflects an increase in publication volume and a recontextualization of PASD as a predictable outcome of surgical obstetrics rather than a rare obstetric anomaly. It underscores the necessity of systemic prevention [4], multidisciplinary management [12], and precision diagnostics [2,23]. This reframing carries significant implications for research prioritization and clinical policy, particularly in

addressing ongoing disparities in PASD outcomes and resource access worldwide [2,12]. This convergence of terminology has been driven by both academic and organizational efforts, particularly the WHO and FIGO initiatives that aim to standardize nomenclature and management protocols for PASD worldwide. The development of terms like “placenta increta” and “placenta percreta” into unified concepts signifies a broader epistemological shift, fueled by cross-national policy alignment and collaborative training programs.

Bridging Bibliometric Insights With Policy, Funding, and Global Equity

This study examines the structural and thematic evolution of research on PASD, underscoring the necessity of enhanced integration with policy frameworks, funding pathways, and the development of clinical guidelines. For instance, institutions such as the University of California, San Francisco (UCSF) and King’s College London have significantly contributed to influential publication clusters, which correspond with their leadership in formulating national clinical guidelines for the management of PASD. These guidelines encompass standardized imaging thresholds and protocols for surgical readiness. By analyzing bibliometric patterns in conjunction with the issuance timelines of these guidelines, we may elucidate a feedback loop wherein high-output institutions influence practice standards and attract additional funding and collaborative opportunities [26,27]. Conversely, research institutions in low- and middle-income countries (LMICs) are significantly underrepresented within citation networks and author clusters, despite bearing a disproportionate burden of maternal morbidity associated with PASD. To rectify this inequity, actionable strategies may include: (1) Establishing South-North research consortia that prioritize co-authorship and equitable data sharing, enabling LMIC researchers to participate in influential citation networks [28]; (2) Providing capacity-building grants to standardize diagnostic imaging practices in LMICs, employing established protocols validated in high-resource settings [29]; (3) Fostering targeted collaborations with high-impact institutions, such as those in the United Kingdom or UCSF, on context-specific research inquiries (e.g., PASD in settings with limited surgical capabilities) to enhance the translational value of findings [26]; (4) Creating policy engagement platforms that utilize bibliometric trends to inform regional health ministries about emerging diagnostic modalities and their cost-effectiveness [27,28]. Incorporating these strategies into global obstetric research priorities could transform bibliometric data from a mere descriptive endpoint into a strategic roadmap for addressing disparities related to PASD. As the field increasingly converges thematically, its infrastructure for knowledge translation and capacity alignment should be appropriately adapted.

China leads in publication volume; however, its relatively low rate of international collaboration (MCP: 3.7%) may be influenced by linguistic and policy-related factors. These constraints can impede the global visibility and methodological exchange of Chinese research, underscoring the necessity of bilingual publication platforms, international funding mechanisms, and policy incentives to promote global partnerships.

Strengths and Limitations

This analysis utilizes a comprehensive longitudinal dataset encompassing 92 years of research on PASD, thereby providing a robust foundation for understanding both historical and emerging trends. Through the application of bibliometric methods, it identifies influential publications, key contributors, and the evolution of research foci over time.

Nevertheless, several limitations warrant acknowledgment. First, the analysis is exclusively dependent on the WoSCC, which may omit research published in regional or non-indexed journals, particularly those in non-English languages. The language limitation may create a selection bias that underrepresents contributions from non-English-speaking countries, especially in Asia, Eastern Europe, and Latin America. Consequently, regional research trends may be underestimated, and the visibility of impactful local studies may be reduced within the global citation network. For example, countries like China and Brazil have active research communities in PASD, but their domestic publications are less likely to be indexed in WoSCC. This situation could distort the perceived geographic distribution of scholarly activity and impede the recognition of region-specific clinical innovations. Second, while citation metrics serve as valuable tools for assessing academic influence, they do not directly reflect clinical adoption or real-world impact. Third, citation lag may impede the visibility of recently published studies that could be significant, especially in the rapidly evolving field of PASD research. To address these issues, future bibliometric analyses should incorporate additional databases such as Scopus, Embase, and regional platforms like CNKI, SciELO, or RSCI. Additionally, conducting multilingual keyword mapping and co-authorship network analysis across language barriers could uncover hidden patterns of scholarly collaboration and innovation. Future studies should consider incorporating alternative impact indicators and utilizing broader databases to attain a more inclusive and practice-oriented perspective.

Conclusions

This bibliometric analysis reviews 758 articles on CS and PASD from 1933 to 2025, showing a 2.64% annual growth, with a peak of 75 publications in 2021. Research has shifted from case studies to a multidisciplinary focus, emphasizing diagnostic methods (ultrasound sensitivity at 93%, MRI specificity at 94%) and treatment strategies (hysterectomy mortality at 0.3%, conservative treatment success at 38%).

The term “placenta accreta lineage” has gained traction since 2020, aligning with FIGO guidelines. AI-assisted imaging accuracy is 91%, and regenerative medicine shows promise. Challenges include optimizing delivery timing, identifying biomarkers for asymptomatic patients, addressing mortality disparities (1.7 per 100,000 in high-income vs. 7.2 in low-income countries), and managing healthcare cost. Future research should focus on drug resistance, combination therapies, and enhancing prevention and treatment through collaboration and real-world data.

Availability of Data and Materials

The raw/processed data generated and/or analyzed during the current study are available in the Web of Science Core Collection repository, <https://webofscience.com/wos/woscc/basic-search>.

Author Contributions

QH was responsible for study design, data collection, and funding procurement. TZ conducted the primary data analysis. HL performed the literature review, contributed to the analysis and interpretation of the data. YX contributed to the interpretation of the data and drafted the initial version of the manuscript. All authors have participated in the critical revision of the manuscript for significant intellectual content, read and approved the final version, and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

Not applicable.

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Conflict of Interest

The authors declare no conflicts of interest.

Supplementary Material

Supplementary material associated with this article can be found, in the online version, at <https://doi.org/10.62713/ai.c.4093>.

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