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Naruaki Ogasawara *

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Editorial Department, The Japanese Society of Internal Medicine, 3-28-8 Hongo Bunkyo-Ward, Tokyo 113-8433, Japan; n-ogasawara@naika.or.jp; Tel.: +81-0-3813-5991; Fax: +81-0-3813-5991

Abstract: Aim: This study aims to analyze the collaborative structure of Intestinal Behçet's Disease (IBD) research by examining co-authorship networks in publications indexed in the Web of Science (WoS) Core Collection from 2000 to 2023. The goal is to identify key researchers, institutions, and collaboration patterns that have shaped the field over the past two decades. **Method:** This study utilized network analysis techniques to evaluate 484 publications related to IBD research indexed in the WoS Core Collection between 2000 and 2023. The analysis was conducted using Python (Version 3.10.5) in the PyCharm development environment (Software Version 2022.1.3). The co-authorship networks were assessed using macro-level indicators such as network density (the ratio of actual to possible connections), clustering coefficient (degree of node clustering), number of components (distinct connected subgroups), and average path length (average distance between nodes). Micro-level indicators including degree centrality (importance based on the number of connections), closeness centrality (proximity to other nodes), and betweenness centrality (frequency of a node on the shortest paths between others) were also analyzed. **Result:** From 2000 to 2009, the co-authorship network was highly fragmented with a low network density of 0.0114 and 84 distinct components, indicating limited collaboration. Key contributors during this period included Kim, Won Ho, and Cheon, Jae Hee (South Korea), who played central roles in connecting disparate research clusters. In the following decade (2010-2019), network density decreased slightly to 0.0086, and the number of components increased to 113, reflecting continued fragmentation despite growing research output. However, from 2020 to 2023, network density increased to 0.0171, and the number of components decreased to 73, indicating a trend towards greater integration and collaboration. Notable researchers in this period included Emmi, Giacomo (Italy), and Hatemi, Gulen (Turkey), who emerged as central figures, highlighting a shift in research leadership from Asia to Europe. **Conclusion:** The co-authorship network analysis of IBD research reveals an evolving collaborative landscape with increasing network density and decreasing fragmentation over time, particularly in the most recent period. From 2000 to 2019, Japanese and Korean researchers were prominent contributors, highlighting the significance of Asia in the global research arena. However, since 2020, researchers from Italy and Turkey have gained significant international prominence, suggesting a shift in the research focus from Asia to Europe. This transition may be attributed to changes in the incidence rates of IBD, where rapid increases were observed in Asian countries like Japan, Korea, and China until 2020, followed by stabilization or decline, while incidence rates have been increasing in European countries such as Italy and Turkey. These findings underscore the importance of expanding international collaborations to enhance the understanding of IBD. Fostering global partnerships could further advance the field, promoting more integrated and innovative research efforts, and addressing the shifting dynamics of IBD prevalence across regions.

Keywords: gastroenterology; immunology; inflammatory diseases; intestinal Behçet's disease; co-authorship network analysis; network analysis; research collaboration; research trend analysis; research trends; key researchers; research strategies; internal medicine; planning future collaborative studies

Introduction

Background and Objectives

Intestinal Behçet's Disease (IBD) is a rare yet severe form of Behçet's Disease that predominantly affects the gastrointestinal tract, leading to symptoms such as abdominal pain, diarrhea, and ulcerations. The understanding of IBD's pathogenesis, treatment, and management poses significant challenges due to its complex nature and the variability in its clinical presentation. Globally, IBD remains under-researched compared to other forms of inflammatory bowel diseases, which necessitates further scientific exploration, particularly in understanding the underlying mechanisms and effective treatment strategies [1,2].

In Western countries, research on IBD is often limited due to its relatively lower prevalence; hence, there is a reliance on data and insights from regions with higher prevalence rates, such as East Asia and the Middle East. Conversely, in Asia, particularly in countries like Japan, South Korea, and China, there has been a more substantial focus on IBD research due to the relatively higher incidence rates. This regional disparity underscores the importance of international collaboration to bridge knowledge gaps and improve the overall understanding of the disease [3,4].

Network analysis of co-authorship provides a robust methodology to explore the collaborative landscape within a research field. By examining co-authorship networks, we can identify key researchers, institutions, and the dynamics of scientific collaboration that drive advancements in the field. Such analyses not only highlight influential figures and groups but also reveal the interconnectedness and collaboration trends within the research community, offering insights into how knowledge is disseminated and how collaborative efforts can be optimized.

Scope of the Study

This study examines publications related to IBD research indexed in the Web of Science (WoS) Core Collection database between 2000 and 2023. A total of 484 articles were selected for analysis, providing a comprehensive overview of the collaborative landscape within this specialized field over the past two decades. The dataset ensures the inclusion of the most recent publications (as of September 2024). The analysis will focus on constructing and evaluating co-authorship networks using macro-level indicators such as network density (the ratio of actual to possible connections), clustering coefficient (the degree to which nodes tend to cluster together), number of components (distinct connected subgroups within the network), and average path length (the average distance between nodes). At the micro-level, I will assess degree centrality (the number of direct connections each node has), closeness centrality (how close a node is to all other nodes), and betweenness centrality (the extent to which a node lies on the shortest path between other nodes). These metrics will help illuminate the structure and dynamics of researcher collaborations in this field.

Significance of the Study

This study holds significant value in the context of IBD research by offering a detailed exploration of the collaborative landscape within this field. Identifying major researchers and institutions involved in IBD research can help highlight leading contributors and emerging leaders. Furthermore, evaluating the progression of international collaborative research and its impact is essential for understanding how global partnerships contribute to advancements in this area. The analysis of network structures and their evolution over time can reveal critical trends, such as shifts in research focus or the emergence of new collaborative clusters.

By providing a clear picture of the current state of research and collaboration in IBD, this study not only enhances our understanding of existing networks but also sheds light on future directions and potential areas for new partnerships. The findings underscore the importance of international collaboration in addressing the complex challenges associated with IBD, highlighting the role of network analysis as a powerful tool for guiding future research strategies and fostering global cooperation.

3

Material and Methods

The present study investigates the co-authorship patterns in IBD research papers. I utilized the WoS Core Collection database, conducting a "Topic Search" with the keyword "Intestinal Behçet's Disease" to analyze a total of 484 articles published between 2000 and 2023 (as of September 2024). In this analysis, I examined who collaborated with whom in co-authoring these papers. I conducted network analysis using the Python programming language (version 3.10.5) within the integrated development environment (IDE) PyCharm (software version 2022.1.3). This study employed methodology-established principles of social network analysis [5]. I carried out the analysis in two main parts:

Macro-Level Metrics:

Network Density: Calculated as the ratio of the number of edges to the maximum possible edges Between all nodes.

Clustering Coefficient: Measured the extent to which nodes form clusters by considering the number of edges among neighboring nodes and calculating the average.

Components: Identified and counted the number of subgraphs (components) where nodes are mutually connected.

Average Path Length: Evaluated the average "distance" between nodes by calculating the overall average path length in the network [6].

Micro-Level Metrics:

Degree Centrality: Measured the importance of each node by counting the number of edges it has in the network.

Closeness Centrality: Defined as the inverse of the sum of the shortest path lengths from a node to all other nodes, measuring how close each node is to others in the network.

Betweenness Centrality: Assessed the extent to which a node lies on the shortest paths between other nodes, indicating its importance in information transmission within the network [6,7].

The significance of these macro-level metrics in understanding the structure of scientific collaboration networks and these micro-level centrality measures in scientific collaboration networks has been well documented and used [6,7]. Through these analyses, I can identify collaborative relationships and influential researchers in IBD research. This information may be useful for understanding research trends and planning future collaborative studies.

Results

The study analyzed the co-authorship network of researchers in IBD research, focusing on the periods from 2000 to 2023. The analysis was conducted using data from the WoS Core Collection and utilized both macro and micro-level network metrics to understand the evolution of collaborative networks in this field.

2000-2009. Network Analysis

During the period from 2000 to 2009, the co-authorship network for Intestinal Behçet's Disease research was characterized by a relatively sparse structure with a network density of 0.0114 (Table 1), indicating that only 1.14% of the possible collaborations between researchers were realized (Figure 1). The network exhibited a high average clustering coefficient of 0.966 (Table 1), suggesting that while overall connectivity was limited, localized clusters of tightly knit groups of researchers existed (Figure 1). There were 84 distinct components within the network (Table 1), highlighting a fragmented structure with many isolated groups (Figure 1). The average distance between nodes was infinite, reflecting the disconnected nature of the network [8].
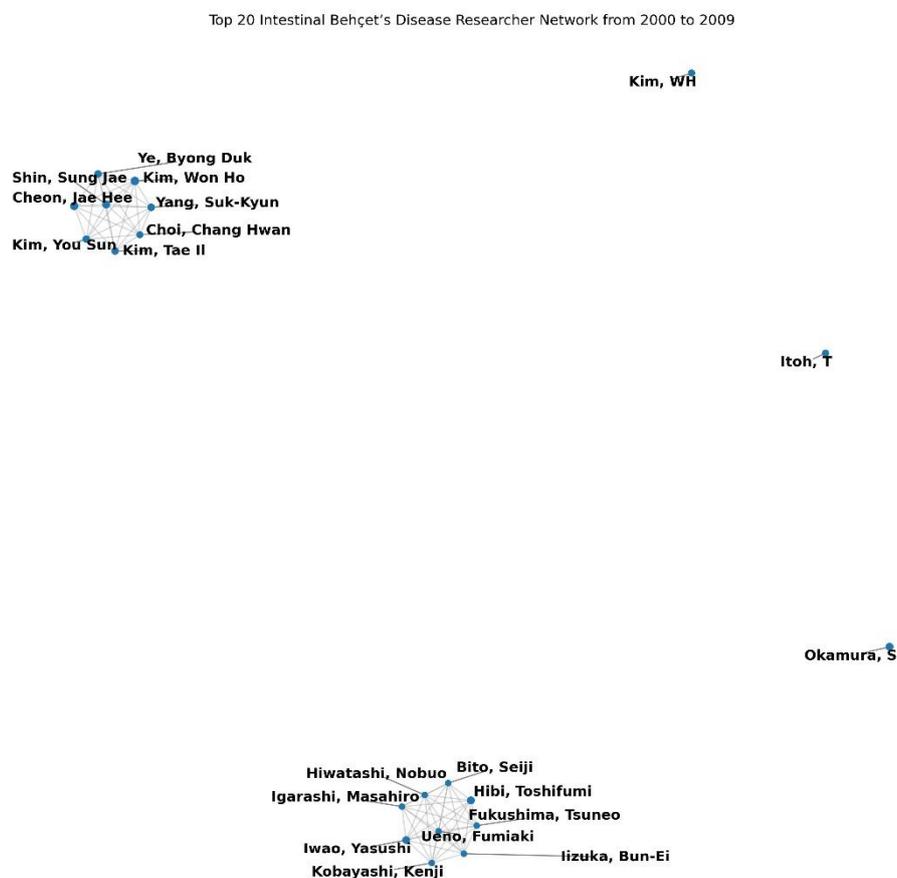
Figure 1. Top 20 Intestinal Behçet's Disease Researcher Network from 2000 to 2009.

Table 1. Network Metrics.

Metric	2000 - 2009	2010 - 2019	2020 - 2023
Network Density	0.0114	0.0086	0.0171
Average Clustering Coefficient	0.966	0.945	0.954
Number of Components	84	113	73
Average Distance	infinite	infinite	infinite

Key researchers based on degree centrality included Kim, Won Ho (0.0390), Cheon, Jae Hee (0.0357), and Shin, Sung Jae (0.0341) (Table 2), indicating their significant roles in collaboration within the field. Closeness centrality also highlighted Kim, Won Ho (0.0406) and Cheon, Jae Hee (0.0384) (Table 3) as central figures, further emphasizing their influence in connecting disparate parts of the network. Betweenness centrality identified Shin, Sung Jae (0.0008) (Table 4) as a crucial intermediary, capable of bridging otherwise separate clusters.

Table 2. Top 20 Nodes by Degree Centrality.

Node	2000 - 2009	Degree Centrality	2010 - 2019	Degree Centrality	2020 - 2023	Degree Centrality
1	Kim, Won Ho	0.0390	Cheon, Jae Hee	0.0676	Emmi, Giacomo	0.1210
2	Cheon, Jae Hee	0.0357	Kim, Won Ho	0.0628	Hatemi, Gulen	0.1018
3	Shin, Sung Jae	0.0341	Kim, Tae Il	0.0475	Direskeneli, Haner	0.0882
4	Hibi, Toshifumi	0.0325	Inoue, Nagamu	0.0362	Gaggiano, Carla	0.0792
5	Okamura, S	0.0325	Tanaka, Masanori	0.0354	Del Bianco, Alessandra	0.0792
6	Iwao, Yasushi	0.0308	Takeno, Mitsuhiro	0.0346	Sota, Jurgen	0.0792
7	Kim, Tae Il	0.0292	Hong, Sung Pil	0.0346	Gentileschi, Stefano	0.0792
8	Kim, You Sun	0.0292	Salvarani, C.	0.0338	Ruscitti, Piero	0.0792
9	Ye, Byong Duk	0.0292	Hibi, Toshifumi	0.0330	Giacomelli, Roberto	0.0792
10	Yang, Suk-Kyun	0.0292	Kunisaki, Reiko	0.0306	Piga, Matteo	0.0792
11	Itoh, T	0.0260	Park, Soo Jung	0.0298	Crisafulli, Francesca	0.0792
12	Kim, WH	0.0260	Ishigatsubo, Yoshiaki	0.0298	Monti, Sara	0.0792
13	Choi, Chang Hwan	0.0244	Lee, Hyun Jung	0.0290	De Paulis, Amato	0.0792
14	Kobayashi, Kenji	0.0211	Kim, Seung Won	0.0282	Vitale, Antonio	0.0792
15	Ueno, Fumiaki	0.0211	Takeuchi, M.	0.0282	Tarsia, Maria	0.0792
16	Bito, Seiji	0.0211	Meguro, A.	0.0282	Caggiano, Valeria	0.0792
17	Fukushima, Tsuneo	0.0211	Mizuki, N.	0.0282	Nuzzolese, Rossana	0.0792
18	Hiwatashi, Nobuo	0.0211	Naganuma, Makoto	0.0282	Parretti, Veronica	0.0792
19	Igarashi, Masahiro	0.0211	Goto, H.	0.0266	Fabiani, Claudia	0.0792
20	Iizuka, Bun-Ei	0.0211	Nagahori, Masakazu	0.0266	Lopalco, Giuseppe	0.0792

Table 3. Top 20 Nodes by Closeness Centrality.

Node	2000 - 2009	Closeness Centrality	2010 - 2019	Closeness Centrality	2020 - 2023	Closeness Centrality
1	Kim, Won Ho	0.0406	Inoue, Nagamu	0.0846	Emmi, Giacomo	0.1265
2	Cheon, Jae Hee	0.0384	Hibi, Toshifumi	0.0801	Hatemi, Gulen	0.1145
3	Shin, Sung Jae	0.0375	Takeno, Mitsuhiro	0.0789	Direskeneli, Haner	0.1074
4	Kim, Tae Il	0.0348	Nagahori, Masakazu	0.0787	Gaggiano, Carla	0.1031
5	Kim, You Sun	0.0348	Tanaka, Masanori	0.0768	Del Bianco, Alessandra	0.1031
6	Ye, Byong Duk	0.0348	Kobayashi, Kiyonori	0.0750	Sota, Jurgen	0.1031
7	Yang, Suk-Kyun	0.0348	Hirai, Fumihito	0.0750	Gentileschi, Stefano	0.1031
8	Choi, Chang Hwan	0.0325	Matsumoto, Takayuki	0.0736	Ruscitti, Piero	0.1031
9	Hibi, Toshifumi	0.0325	Kunisaki, Reiko	0.0725	Giacomelli, Roberto	0.1031
10	Okamura, S	0.0325	Cheon, Jae Hee	0.0709	Piga, Matteo	0.1031
11	Iwao, Yasushi	0.0309	Ishigatsubo, Yoshiaki	0.0702	Crisafulli, Francesca	0.1031
12	Kim, Eun Soo	0.0304	Hisamatsu, Tadakazu	0.0698	Monti, Sara	0.1031
13	Lee, Kang Moon	0.0304	Ueno, Fumiaki	0.0687	De Paulis, Amato	0.1031
14	Kim, Sang Woo	0.0304	Koganei, Kazutaka	0.0687	Vitale, Antonio	0.1031
15	Kim, Joo Sung	0.0304	Matsushita, Mitsunobu	0.0687	Tarsia, Maria	0.1031
16	Choi, Eun Hee	0.0304	Kobayashi, Kenji	0.0687	Caggiano, Valeria	0.1031

17	Lee, Sang Kil	0.0292	Kishimoto, Mitsumasa	0.0687	Nuzzolese, Rossana	0.1031
18	Kim, WH	0.0281	Kim, Won Ho	0.0678	Parretti, Veronica	0.1031
19	Kim, Byung Chang	0.0271	Naganuma, Makoto	0.0664	Fabiani, Claudia	0.1031
20	Kim, Hyon Suk	0.0271	Kurosawa, Michiko	0.0647	Lopalco, Giuseppe	0.1031

Table 4. Top 20 Nodes by Betweenness Centrality.

Node	2000 - 2009	Betweenness Centrality	2010 - 2019	Betweenness Centrality	2020 - 2023	Betweenness Centrality
1	Shin, Sung Jae	0.0008	Takeno, Mitsuhiro	0.0069	Emmi, Giacomo	0.0103
2	Kim, WH	0.0007	Tanaka, Masanori	0.0065	Hatemi, Gulen	0.0060
3	Okamura, S	0.0005	Kunisaki, Reiko	0.0043	Chen, Minhu	0.0033
4	Kim, JH	0.0005	Inoue, Nagamu	0.0042	Direskeneli, Haner	0.0026
5	Kim, Won Ho	0.0003	Okazaki, Kazuichi	0.0038	Yang, Hong	0.0021
6	Itoh, T	0.0003	Mizuki, Nobuhisa	0.0034	Cheon, Jae Hee	0.0020
7	Hibi, Toshifumi	0.0003	Inoue, Takuya	0.0034	Lee, Bo-In	0.0019
8	Cheon, Jae Hee	0.0002	Saito, Kazuyoshi	0.0031	Ye, Byong Duk	0.0016
9	Iwao, Yasushi	0.0002	Cheon, Jae Hee	0.0028	Suzuki, Yasuo	0.0012
10	Kim, Tae Il	0.0001	Matsumoto, Takayuki	0.0027	Mizuki, Nobuhisa	0.0011
11	Kim, You Sun	0.0001	Tanida, Satoshi	0.0022	Hwang, Sung Wook	0.0007
12	Ye, Byong Duk	0.0001	Hibi, Toshifumi	0.0022	Liu, Wei	0.0006
13	Yang, Suk-Kyun	0.0001	Kim, Won Ho	0.0021	Qian, Jiaming	0.0006
14	Imamura, Y	0.0000	Nagahori, Masakazu	0.0019	Park, Soo Jung	0.0006
15	Tsukikawa, S	0.0000	Ishigatsubo, Yoshiaki	0.0018	Takeno, Mitsuhiro	0.0005
16	Matsuda, T	0.0000	Celik, Aykut Ferhat	0.0017	Han, Wei	0.0003
17	Lee, Sang Kil	0.0000	Naganuma, Makoto	0.0012	Tan, Bei	0.0003
18	Choi, Chang Hwan	0.0000	Kikuchi, Hirotoshi	0.0010	Kim, Won Ho	0.0003
19	Lee, CR	0.0000	Nakase, Hiroshi	0.0009	Yu, Jongwook	0.0003
20	Cho, YS	0.0000	Kim, Nam Kyu	0.0009	Omori, Teppei	0.0002

2010-2019. Network Analysis

From 2010 to 2019, the network's density decreased to 0.0086 (Table 1), reflecting a continued sparsity in collaborative efforts despite an increase in research output (Figure 2). The average clustering coefficient remained high at 0.945 (Table 1), indicating the persistence of localized collaboration clusters (Figure 2). The number of components rose to 113 (Table 1), showing an even more fragmented network compared to the previous decade, and the average distance between nodes continued to be infinite, suggesting large sections of the network were still not interconnected [8].
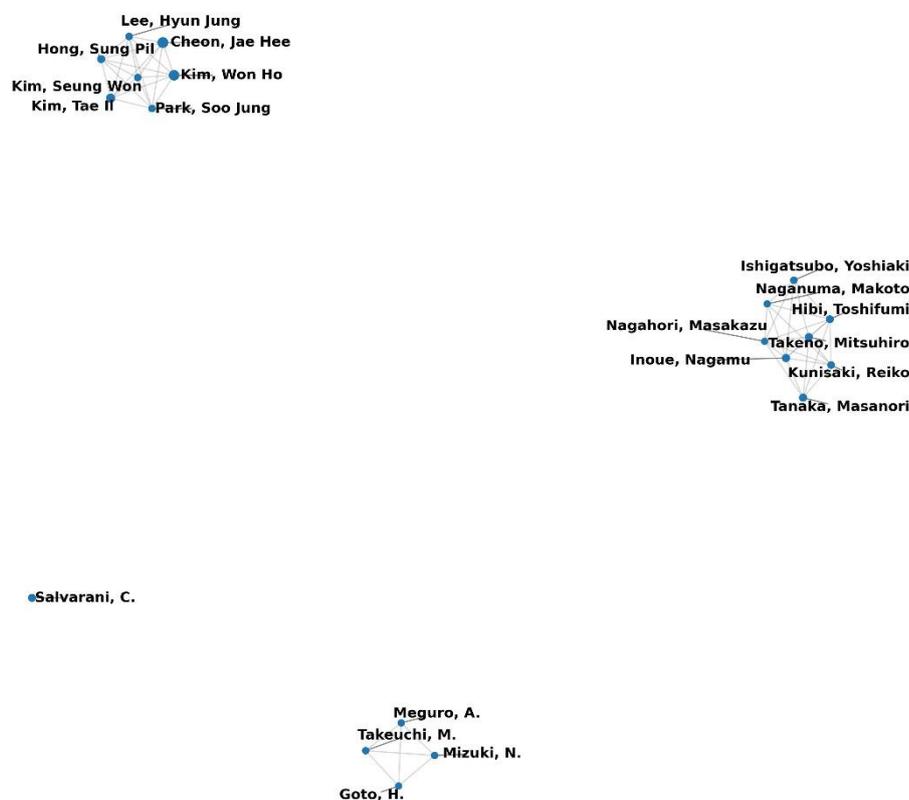
Figure 2. Top 20 Intestinal Behçet's Disease Researcher Network from 2010 to 2019.

The most prominent researchers in this period included Cheon, Jae Hee (0.0676) and Kim, Won Ho (0.0628) (Table 2), who not only had high degree centrality but also played key roles as connectors within the network, as shown by their closeness centrality scores (Table 3). Betweenness centrality scores highlighted Takeno, Mitsuhiro (0.0069) and Tanaka, Masanori (0.0065) (Table 4) as influential intermediaries, playing significant roles in facilitating collaborations across different research clusters.

2020-2023. Network Analysis

In the most recent period from 2020 to 2023, the network density increased to 0.0171 (Table 1), reflecting a noticeable enhancement in collaborative efforts within the field (Figure 3). The average clustering coefficient was slightly lower at 0.954 compared to earlier periods (Table 1), still indicating a strong tendency towards forming clusters (Figure 3). The number of components decreased to 73 (Table 1), suggesting a trend towards more connected research networks. However, the average distance between nodes remained infinite, indicating that full connectivity was not yet achieved [8].
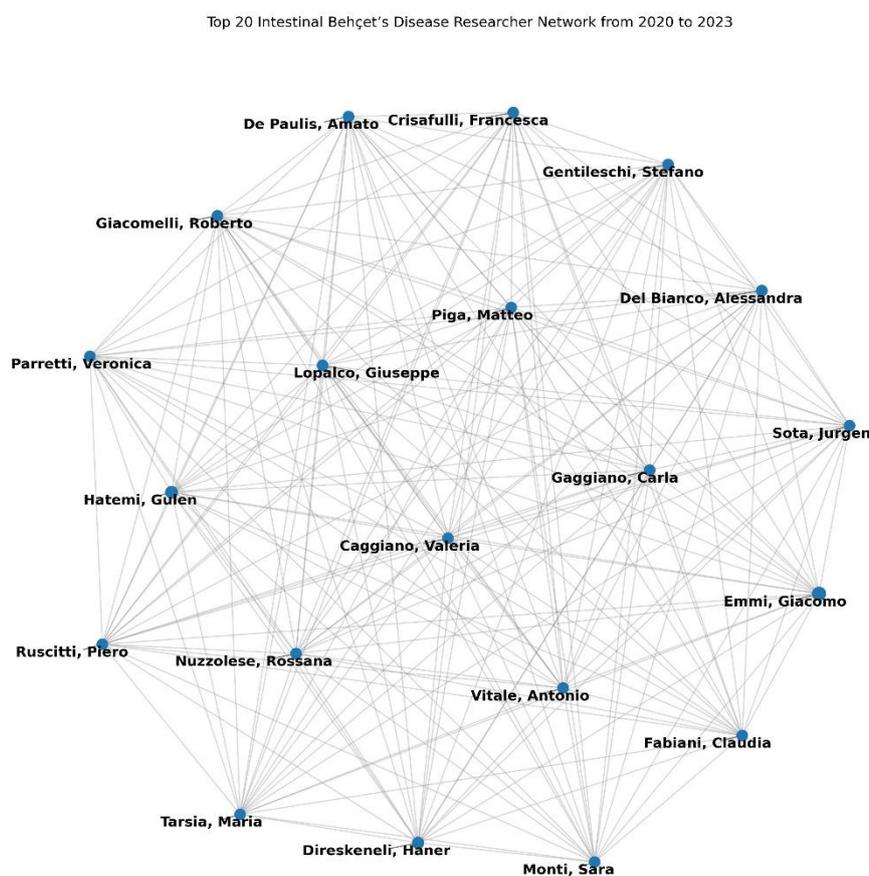
Top 20 Intestinal Behçet's Disease Researcher Network from 2020 to 2023

Figure 3. Top 20 Intestinal Behçet's Disease Researcher Network from 2020 to 2023.

The top researchers by degree centrality included Emmi, Giacomo (0.1210), Hatemi, Gulen (0.1018), and Direskeneli, Haner (0.0882) (Table 2), who were central to collaboration efforts. Emmi, Giacomo also led in closeness centrality (0.1265) (Table 3), reinforcing his pivotal position in the network. In terms of betweenness centrality, Emmi, Giacomo (0.0103) and Hatemi, Gulen (0.0060) (Table 4) were identified as critical nodes in maintaining the flow of information and collaboration across different parts of the network.

Summary

The co-authorship network analysis of Intestinal Behçet's Disease research from 2000 to 2023 reveals a progressively evolving structure with increasing network density and a decreasing number of components, indicative of enhanced collaboration over time. Initially characterized by fragmented and localized clusters, the network gradually moved towards a more interconnected structure, particularly in the most recent period from 2020 to 2023. Notable researchers such as Kim, Won Ho (South Korea) and Cheon, Jae Hee (South Korea) played key roles in the early decades, while recent years have seen the emergence of new central figures such as Emmi, Giacomo (Italy) and Hatemi, Gulen (Turkey).

From 2000 to 2009 (Table 2) and 2010 to 2019 (Table 3), Japanese and South Korean researchers were particularly prominent. However, since 2020 (Table 4), researchers from Italy and Turkey have gained significant global recognition, indicating a shift in the research hub from Asia to Europe. This analysis suggests that promoting collaborative research between Asian and European countries would be beneficial.

Overall, the analysis demonstrates that while collaboration in Intestinal Behçet's Disease research has grown, significant opportunities remain for further integration and connectivity among researchers worldwide, which could potentially enhance the field's capacity for innovation and collective problem-solving.

Discussion

The co-authorship network analysis of IBD research from 2000 to 2023 provides valuable insights into the evolving landscape of scientific collaboration within this specialized field. My findings demonstrate significant temporal shifts in network structures, key contributors, and regional dynamics, reflecting broader trends in the field's development.

Over the analyzed periods, the network density, an indicator of collaborative intensity, exhibited notable fluctuations. The initial decade (2000-2009) was characterized by a sparse network with low connectivity, as indicated by the network density of 0.0114. This sparse structure suggests that early IBD research was conducted in isolated clusters with minimal cross-collaboration. During this time, prominent researchers such as Kim, Won Ho, and Cheon, Jae Hee were central figures, underscoring their pivotal roles in fostering initial collaborative efforts, especially within regional contexts such as South Korea.

The subsequent decade (2010-2019) saw a decline in network density to 0.0086 despite an increase in publication output, highlighting persistent fragmentation and the emergence of more distinct, localized research clusters. The presence of 113 components during this period suggests that while the research community expanded, it did so in a disjointed manner, with limited integration among research groups. Notably, Japanese researchers such as Takeno, Mitsuhiro and Tanaka, Masanori emerged as key intermediaries, playing significant roles in bridging some of these gaps.

In contrast, the period from 2020 to 2023 marked a turning point, with network density increasing to 0.0171 and a reduction in the number of components to 73. This suggests a positive trend towards greater interconnectedness and collaboration within the IBD research community. The rise of new central figures such as Emmi, Giacomo (Italy), and Hatemi, Gulen (Turkey) highlights a shift in the locus of collaboration from Asia to Europe, reflecting a broader diversification in the global research landscape. This transition underscores the importance of expanding international collaborations to leverage diverse regional expertise and address the global nature of IBD.

The observed shifts in network centrality metrics over time reveal evolving patterns of influence and collaboration in IBD research. Initially dominated by a few key players from East Asia, the field has seen a diversification of influential researchers from different regions. This geographical expansion aligns with the global need for a more comprehensive understanding of IBD, which varies significantly across populations. The emergence of European researchers as central figures in the most recent period underscores a potential shift in research leadership, with implications for the direction of future studies and collaborative efforts.

Despite the progress noted in recent years, the network analysis indicates that there remains considerable room for improvement in global collaboration. The persistent presence of multiple components and the infinite average distance between nodes suggest that many research groups operate in relative isolation. Enhancing connectivity between these groups could be achieved through targeted initiatives that promote cross-border collaborations, joint research projects, and international conferences focused on IBD. These efforts would not only strengthen the overall research network but also facilitate the exchange of knowledge and resources necessary to address the complexities of IBD effectively.

One of the primary challenges identified in this study is the regional disparity in research activity, with certain areas such as East Asia and, more recently, Europe, driving much of the

collaborative momentum. Furthermore, the analysis of micro-level metrics such as degree, closeness, and betweenness centrality provides insights into individual researchers' roles within the network. Key figures identified through these measures are not only leaders in the field but also potential catalysts for broader collaborative efforts. Supporting these researchers through funding, collaborative platforms, and institutional backing could amplify their impact and foster a more cohesive research community.

Conclusion

This study provides a comprehensive analysis of the co-authorship networks in IBD research from 2000 to 2023, highlighting the evolving landscape of collaboration within this specialized field. By examining the network structures using both macro-level (network density, clustering coefficient, components, average path length) and micro-level indicators (degree centrality, closeness centrality, betweenness centrality), the study identifies key researchers, influential clusters, and trends in global collaboration.

From 2000 to 2009, the network exhibited a highly fragmented structure, characterized by numerous isolated components and localized clusters of researchers. Notable figures such as South Korea's Kim, Won Ho, and Cheon, Jae Hee were instrumental in connecting disparate parts of the network, primarily within the context of regional collaborations in East Asia. Despite these efforts, the overall network density remained low, underscoring the limited extent of cross-border collaboration during this early period.

The 2010-2019 period saw a further decrease in network density, reflecting a continued challenge in achieving broader integration across research groups. This era was marked by the emergence of Japanese researchers like Takeno, Mitsuhiro, and Tanaka, Masanori as pivotal intermediaries, bridging otherwise isolated clusters. However, the increasing number of components indicated persistent fragmentation, suggesting that despite growing research output, collaborative efforts were still largely confined within regional boundaries.

In contrast, the period from 2020 to 2023 represented a notable shift towards enhanced collaboration, as evidenced by increased network density and a reduction in the number of components. This positive trend suggests that the IBD research community has become more interconnected, with new central figures such as Emmi, Giacomo (Italy), and Hatemi, Gulen (Turkey) playing leading roles. The rise of these researchers signifies a shift in the collaborative epicenter from Asia to Europe, highlighting the growing influence of European researchers in the global IBD research landscape.

Overall, the analysis reveals that while collaboration in IBD research has improved significantly over the past two decades, there remain substantial opportunities for further integration and connectivity among researchers worldwide. The identification of key researchers and the understanding of network dynamics can help inform future strategies to foster international collaboration, thereby enhancing the field's capacity for innovation and addressing the complex challenges associated with IBD. The findings underscore the importance of continued efforts to bridge regional divides, promote global partnerships, and leverage the diverse expertise within the IBD research community to drive forward advancements in understanding, treating, and managing this challenging disease.

Abbreviations

WoS, Web of Science; IDE, Integrated Development Environment; IBD, Intestinal Behçet's Disease.

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