Cienciometric analysis of canine chronic enteropathy

ABSTRACT

The objective of this study is to present, through scientometrics, data obtained from research related to chronic enteropathy in dogs. For this purpose, using the *Web of Science* database, 111 articles were selected for screening based on the criteria of title, language, species, and topic. Thus, data were collected on the number of articles published by date, keywords used, number of authors, and institutions. The results demonstrate that the year 2022 recorded the highest number of publications, with 27 papers. Among the authors, three stood out for having between 12 and 18 publications. Furthermore, the number of studies per institution varied between 43 and 13 articles. Through this study, it was possible to conclude that research like this can contribute to the development of solutions for managing chronic enteropathies in dogs.

Keywords: Chronic enteropathy, dog.

1. INTRODUCTION

The gastrointestinal tract (GIT) serves multiple functions, including digestion, nutrient absorption, enzymatic secretion, hydroelectrolytic reabsorption, mechanical barrier against bacterial translocation, and immune function [1]. Disorders of this system are among the leading reasons why dog and cat owners seek veterinary care [2].

Canine Chronic Enteropathy (CCE), previously known as inflammatory bowel disease (IBD) [3], is a term applied to chronic idiopathic changes in the GIT after excluding extraintestinal factors, infectious, parasitic, dietary, hormonal, and neoplastic diseases. CCE can be classified as diet-responsive, antibiotic-responsive, immunosuppressant-responsive, and non-responsive enteropathy [4].

Although the etiology is unknown, it may be related to multiple factors such as genetics, immune intolerance, dysbiosis, and dietary components [5]. It is suggested that CCE results from an exaggerated immune response to intestinal antigens, which alters mucosal permeability and the intestinal microbiota [6]. The main clinical signs observed in affected animals include diarrhea, vomiting, weight loss, and changes in appetite [7]. Endoscopy is recommended for collecting intestinal material and aiding diagnosis, as it is minimally invasive and allows direct visualization of the gastric and intestinal mucosa. Through endoscopy, biopsies can be performed to reveal intestinal inflammatory infiltrates [7].

Therefore, with the advancement of diagnostic methods and updates in the definitions and etiological factors of canine intestinal diseases, it is essential to conduct an analysis of the scientific production on this subject. Scientometrics will be used for this purpose.

This study aims to present research and data with a scientometric focus, producing a quantitative analysis of the scientific production on chronic enteropathy in dogs. The goal is to support research and scientific articles by quantifying the number of studies published per

year on chronic enteropathy in dogs, identifying the leading authors, institutions, scientific journals, and countries that publish most on the subject, highlighting the main objectives of the evaluated studies, analyzing the type of published work (review, original study, or case study), and identifying the area of knowledge to which the studies belong.

2. MATERIAL AND METHODS

This study has a quantitative, descriptive, and analytical focus. The data was gathered from the *Web of Science* database using the keywords "Chronic enteropathy AND Dog." The collected data includes both original research articles and review papers. For the selected publications, the following data will be extracted: year of publication, names of the authors, institution affiliated with the first author, name of the journal where the article was published, country of publication, keywords used in the studies, type of document (original article or review), field of knowledge, article language, number of citations, number of authors, and the journal's impact factor.

3. RESULTS AND DISCUSSION

In the research, 274 results (100%) were obtained according to the keywords used. A total of 163 articles (59.48%) were excluded, and 111 articles (40.5%) written in English and German were selected. The exclusion criteria involved removing articles that did not have "enteropathy" in the title (83 articles), studies that included cats (43 articles), studies involving humans (5 articles), studies involving pigs (1 article), studies involving cattle (1 article), and studies where Canine Chronic Enteropathy was not the main topic (30 articles) (Figure 1).

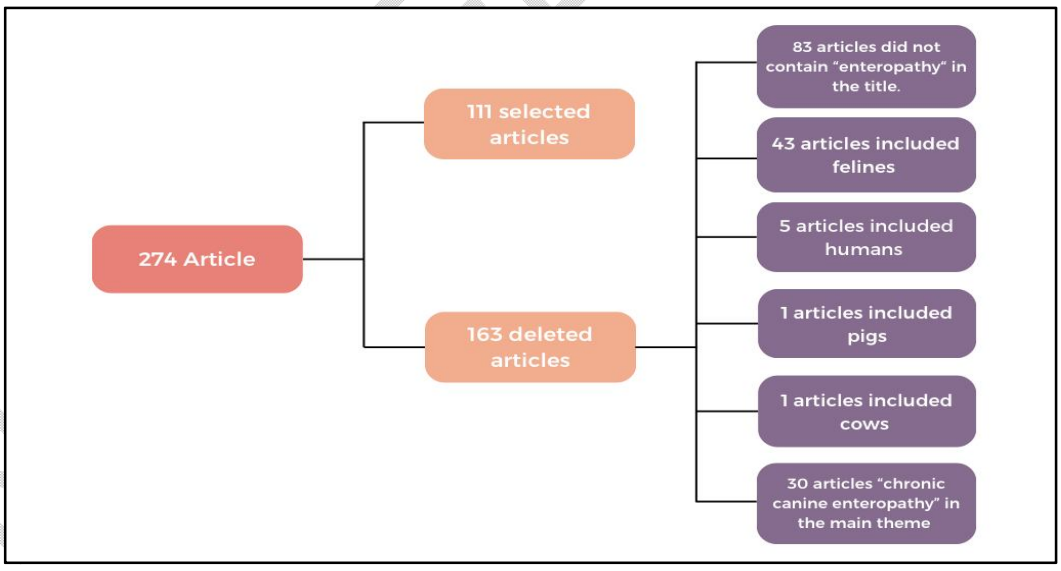

Fig. 1. Flowchart of the research results in the *Web of Science* database.

Thus, the annual scientific production has been quantified as follows: 2015 (2 articles); 2016 (5 articles); 2017 (6 articles); 2018 (7 articles); 2019 (17 articles); 2020 (8 articles); 2021 (23 articles); 2022 (27 articles); 2023 (15 articles); and 2024 (1 article) (Figure 2).

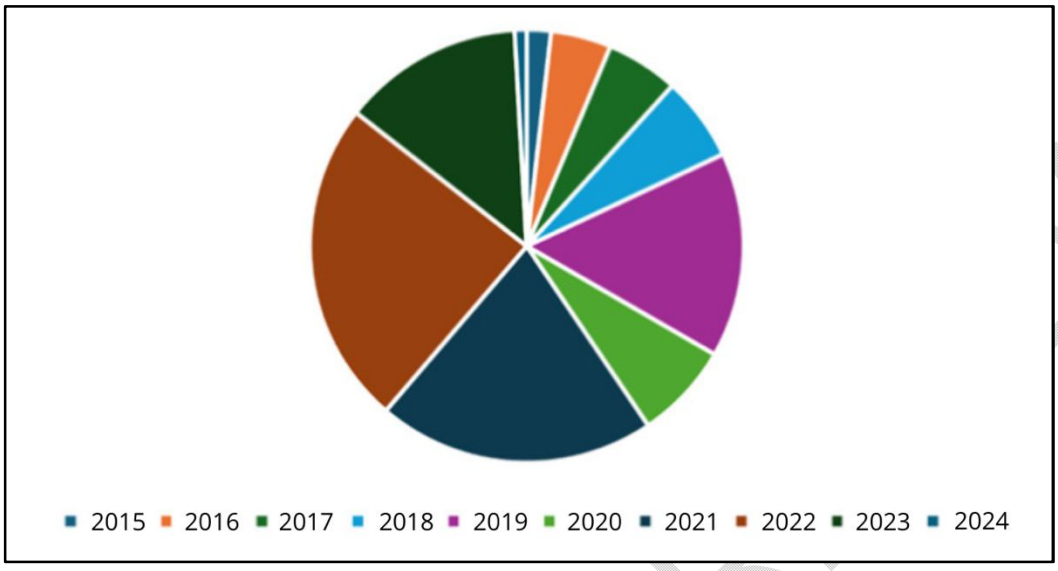

Fig. 2. Figure representing the number of Annual Scientific Production between the years 2015 to 2024.

In the research, a significant number of keywords used by the authors of the articles were observed, with particular emphasis on the terms: "Diagnosis," "gastrointestinal inflammation," and "bowel disease."

Among the selected articles, three authors stood out in terms of the number of published works: Steiner JMwith 18 articles, JSde Suchodolski also with 18 articles, and Allenspach K with 12 articles.

Among the most relevant affiliations, the following institutions stood out: Texas A&M University with 43 articles, Iowa State University with 30 articles, University of Veterinary Medicine with 25 articles, Leipzig University with 24 articles, and Hokkaido University with 13 articles, the latter being the one with the fewest publications.

The scientometric analysis of the scientific production on canine chronic enteropathy (CCE) revealed a substantial increase in the number of publications over the years, especially from 2019 onward. This increase may correlate with the growing interest in understanding chronic gastrointestinal diseases in dogs, as described by [4] and corroborated by studies from Steiner JM and Suchodolski JS, which have been fundamental to this research topic. Just as [3] identified the evolution in the terminology and approach to CCE, the data from this study reflect the intensification of research and diversification of diagnostic approaches.

The exclusion of 163 articles (59.48%) was necessary to ensure the relevance of the included studies, eliminating those that did not focus directly on CCE or involved other species. This selective approach is essential to maintain the precision and specificity of the analysis, as described by [5], who emphasizes the importance of a clear definition of diagnostic and research criteria in studies on CCE. The exclusion of articles involving other species, such as felines and humans, aligns with the need for a specific focus on canine CCE, avoiding inappropriate generalizations.

The growth in scientific production on CCE, especially the peak observed between 2019 and 2023, can be attributed to increased clinical awareness of the disease and the introduction of new diagnostic techniques, such as endoscopy, as highlighted by [7]. This growth also reflects the need for new therapeutic and diagnostic strategies, as suggested by [6], who discuss the complexities of the immune response and intestinal microbiota in dogs with CCE.

The most productive authors, such as Steiner JM, Suchodolski JS, and Allenspach K, are prominent figures in veterinary gastroenterology, which corroborates the relevance of their contributions to advancing knowledge about the disease. The leadership of Texas A&M University and other important institutions reinforces the idea that research on CCE is concentrated in centers with a strong capacity for investigating canine inflammatory bowel diseases. These findings align with the theoretical framework, which highlights the need for a continuous effort to systematize knowledge about CCE, reflected in the scientometric indicators that guide scientific progress [5].

The data analysis suggests that the ongoing growth in scientific production on CCE may be related to the development of new diagnostic and therapeutic techniques that address the complexity of the disease [1]. This scenario raises the hypothesis that CCE will continue to be an important research focus, especially as new methods for evaluating intestinal microbiota and the immune response are developed. The need for greater collaboration between institutions can also be inferred from the data, pointing to a future where research on CCE becomes even more interdisciplinary and global.

There are still significant gaps, particularly in terms of diagnostic and therapeutic standardization [4]. The heterogeneity of the included studies, as well as the different diagnostic approaches, may hinder direct comparisons between results, indicating the need for clearer and universally accepted guidelines. The development of new diagnostic methods, such as endoscopy, should be accompanied by efforts to unify clinical and research practices, ensuring greater consistency in the produced data [7].

4. CONCLUSION

The conducted scientometrics provides a comprehensive view of the current state of research on CCE, highlighting both advancements and areas that require more attention. It is suggested that future investigations explore not only new therapeutic approaches but also the standardization of diagnostic criteria and the expansion of international collaboration to further strengthen the field. The establishment of collaborative research networks, as observed in multicenter studies, could accelerate the development of effective solutions for managing CCE.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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