A bibliometric analysis of the global trend of using alginate, gelatine, and hydroxyapatite for bone tissue regeneration applications

ABSTRACT

Collecting information from previous investigations and expressing it in a scientometrics study can be a priceless guide to getting a complete overview of a specific research area. The aim of this study is to explore the interrelated connection between alginate, gelatine, and hydroxyapatite within the scope of bone tissue and scaffold. A review of traditional literature with data mining procedures using bibliometric analyses was considered to identify the evolution of the selected research area between 2009 and 2019. Bibliometric methods and knowledge visualization technologies were implemented to investigate diverse publications based on the following indicators: year of publication, document type, language, country, institution, author, journal, keyword, and number of citations. An analysis using a bibliometric study found that 7446 papers were located with the keywords "bone tissue" and "scaffold", and 1767 (alginate), 185 (gelatine), 5658 (hydroxyapatite) papers with those specific sub keywords. The number of publications that relate to "tissue engineering" and bone more than doubled between 2009 (1352) and 2019 (2839). China, the United States and India are the most productive countries, while Sichuan University and the Chinese Academy of Science from China are the most important institutions related to bone tissue scaffold. Materials Science and Engineering C is the most productive journal, followed by the Journal of Biomedical Materials Research Part A. This paper is a starting point, providing the first bibliometric analysis study of bone tissue and scaffold considering alginate, gelatine and hydroxyapatite. A bibliometric analysis would greatly assist in giving a scientific insight to support desired future research work, not only associated with bone tissue engineering applications. It is expected that the analysis of alginate, gelatine and hydroxyapatite in terms of 3D bioprinting, clinical outcomes, scaffold architecture, and the regenerative medicine approach will enhance the research into bone tissue engineering in the near future. Continued studies into these research fields are highly recommended.