Mapping Emerging Trends in Conservative Treatment of Adolescent Idiopathic Scoliosis: A Bibliometric Analysis of Sensor-Integrated Strategies and Intelligent Braces

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Background

A popular conservative treatment plan for Adolescent Idiopathic Scoliosis (AIS) includes brace therapy. Prolonged brace wear is challenging. Integrating sensor technology may offer personalized support by monitoring usage and patient condition. This may enhance adherence, and enable remote monitoring of AIS, its progression, and management. We performed the bibliometric analysis to explore the status and trends in sensor-based brace treatment for AIS.

Methods

The Web of Science was searched up to February 2024 employing "sensor*", "Intelligent* brace*", and "Adolescent Idiopathic Scoliosis" as main keywords to ensure the inclusion of relevant studies. The Bibliometrix application was applied next to obtain visual representations of bibliometric data and to identify key trends and patterns in sensor-based approaches for managing AIS.

Results

The search identified 61 articles, with 11 relevant. Conservative AIS treatment research dates back to the 1980s, while sensor-based braces were predominant from 2004 to 2024. Prolific authors such as HILL DL, LOU E, and RASO JV have contributed for two decades, while others like BIRCH JG, BROWNE RH, HERRING JA, and KATZ DE have made notable recent contributions. Emerging authors were BIFFI E, CASTILLA D, and NEGRINI S. Scientific productions originate from diverse regions, with the USA as the most cited. Key terms like "Curve Progression" and "Adolescent Idiopathic Scoliosis" have dominated for over a decade. "Time" emerged as a prevalent keyword in 2004, while "Force" gained prominence in 2010. Emerging themes include "Sensors," "Monitoring," "Adherence," and "Interventions."

Conclusion

Our analysis highlights the increasing significance of sensor technology in braces treatment. Prioritizing research integrating user and health professional perspectives seems crucial to better meet patient needs and improve the efficacy and usability of brace treatment for AIS.

Disclosures

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