Metformin use is inversely correlated with symptomatic endodontic diagnoses

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Objectives: Metformin, an anti-hyperglycemic medication, is used to treat type 2 diabetes. In addition to its ability to control the amount of glucose in the blood, metformin also has an anti-inflammatory effect. It has been shown to reduce the severity of induced rat periapical lesions suppressing osteolytic activity and reducing monocyte recruitment. We hypothesize that metformin may contribute to diminished pulpal and periapical inflammation in humans. The purpose of this retrospective study is to verify if correlations exist between endodontic diagnoses and metformin use.

Experimental Methods: Patient data from the UTSD electronic health record was extracted from 1/1/2016 to 5/1/2022. Information on age, gender, endodontic diagnoses, presence of periapical lesions, type and dosage of metformin medications was recorded. Pulpal endodontic diagnoses included asymptomatic irreversible pulpitis, normal pulp, previously initiated treatment, pulp necrosis, previously treated, and symptomatic irreversible pulpitis. Periapical endodontic diagnoses included acute apical abscess, asymptomatic apical periodontitis, chronic apical abscess, normal apical tissue, and symptomatic apical periodontitis. No identifying personal patient health information was extracted.

Results: Fisher's exact tests were used to evaluate the differences between patients taking metformin and patients taking no medications. P-values less than 0.05 were statistically significant. Individuals in the metformin group had significantly more normal pulps than individuals not taking metformin. In addition, individuals in the metformin group had significantly more pulp necrosis and symptomatic irreversible pulpitis diagnoses compared to individuals not taking metformin. There were no statistically significant differences in periapical diagnoses.

Conclusion: The use of metformin may have an inversely correlated effect on endodontic diagnoses. Metformin medications may be used to improve the healing and alleviate the progression of periapical lesions by suppressing osteolytic activity and reducing monocyte recruitment. We hope that by understanding potential benefits of metformin on periapical lesions, this medication can be used as an adjunct modality when diagnosing patients with periapical periodontitis and abscesses.

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