

Original Research

Prevalence of irreversible pulpitis in a known population

Dr. Raghunandini Batra¹, Dr. Dal Singh Singh²

¹B.D.S

²B.D.S

Abstract

Background: This study was conducted to assess the prevalence of irreversible pulpitis in a known population.

Material and methods: In this study, the prevalence of irreversible pulpitis was assessed. Overall, 100 subjects underwent oral clinical examination. The subjects had been informed about the procedure and were asked for informed consent. The subjects who gave consent had been included in the study. The findings had been noted and tabulated. Statistical analysis was conducted using SPSS software.

Results: In this study, there were 65 males and 35 females. Irreversible pulpitis was present in 41% subjects and was absent in 59% subjects. The prevalence of irreversible pulpitis was 59%.

Conclusion: The findings of this study concluded that prevalence of irreversible pulpitis was 59%.

Keywords: Irreversible pulpitis, Prevalence

Received Date: 15 December, 2024

Acceptance Date: 19 January, 2025

Corresponding author: Dr. Raghunandini Batra, B.D.S

This article may be cited as: Batra R, Singh D S, Prevalence of irreversible pulpitis in a known population. Int J Res Health Allied Sci 2025; 11(1):20-22

Introduction

The pulp tissue responds to various irritants, primarily bacterial in nature, by initiating an inflammatory response. The severity and duration of the irritant, along with the host's resistance, determine the extent of pulp tissue pathology, which can range from reversible inflammation to severe, irreversible inflammation culminating in necrosis.^{1,2}

The inflammatory response observed in the periapical tissues due to physical, chemical, and/or bacterial irritants from the pulp³ can manifest as either acute or chronic, contingent upon the interaction between the host and the offending agent. This interaction is influenced by the presence of bacterial toxins and bacteria that infiltrate the periapical tissues via the apical foramen.⁴⁻⁷

Additionally, similar inflammatory processes may occur in other regions of the periodontium,

particularly through lateral canals or at the root division, where communication exists between the pulp chamber floor and the periodontal tissue.⁸

This study was conducted to assess the prevalence of irreversible pulpitis in a known population.

Material and methods

In this study, the prevalence of irreversible pulpitis was assessed. Overall, 100 subjects underwent oral clinical examination. The subjects had been informed about the procedure and were asked for informed consent. The subjects who gave consent had been included in the study. The findings had been noted and tabulated. Statistical analysis was conducted using SPSS software.

Results

Table 1: Gender-wise distribution of subjects.

Gender	Number of subjects	Percentage
Male	65	65
Female	35	35
Total	100	100

In this study, there were 65 males and 35 females.

Table 2: Prevalence of irreversible pulpitis

Prevalence	Number	Percentage
Absent	59	59
Present	41	41

Irreversible pulpitis was present in 41% subjects and was absent in 59% subjects.

Discussion

In the conventional understanding of dental pathology, the diagnosis of irreversible pulpitis occurs when pulp inflammation reaches a critical threshold, leading to the recommendation of root canal therapy (RCT) for the complete removal of the affected pulp tissue. Nonetheless, RCT may result in diminished vascular supply, thereby increasing the susceptibility of the tooth to fractures. Historically, RCT has been regarded as the standard treatment; however, the long-term success rate for teeth subjected to RCT is notably lower compared to that of vital teeth, a trend that is especially pronounced in molars.⁹⁻¹¹

This discrepancy may be attributed to the enhanced structural integrity of vital teeth, which possess greater amounts of both soft and hard tissues, allowing them to better withstand occlusal forces within physiological limits. To preserve more of the tooth's soft and hard tissues than RCT allows, vital pulp therapy (VPT) emerges as a promising individualized approach for managing irreversible pulpitis. This technique involves the selective removal of pulp tissue based on the condition of the pulp, aligning with the principles of minimally invasive endodontics. Furthermore, the retention of vital pulp is beneficial for the physiological development of the roots in young permanent teeth that have not yet fully formed their apical foramina.^{12,13}

This study was conducted to assess the prevalence of irreversible pulpitis in a known population.

In this study, there were 65 males and 35 females. Irreversible pulpitis was present in 41% subjects and was absent in 59% subjects. The prevalence of irreversible pulpitis was 59%.

The aim of the study conducted by Perez AS et al¹⁴ was to estimate the prevalence of pulp and periapical pathologies and their distribution according to sex, age, affected teeth, and etiological factors found in patients the DEPeI, FO, UNAM Endodontic Postgraduate Program during the period 2014–2019. The data collected were from the records of the Single Clinical File of patients treated at the Endodontic Specialization Clinic, DEPeI, FO, UNAM, period 2014–2019. The following variables were recorded for each endodontic file: diagnosed pulp and periapical pathology, sex, age, affected tooth, and etiological factor. Descriptive statistical analysis was

performed with 95% CI (Confidence intervals). Of all the registers reviewed, irreversible pulpitis (34.58%)

and chronic apical periodontitis (34.89%) proved to be the most prevalent pulp and periapical pathologies, respectively. The female sex predominated (65.36%). The age group that requested the most endodontic treatment, according to the records reviewed, was 60 or older (36.99%). The most treated teeth were the upper first molars (24.15%) and lower (36.71%), and the most prevalent etiological factor was dental caries (84.07%). Irreversible pulpitis and chronic apical periodontitis were the most prevalent pathologies. The predominant sex was female, and the age group was 60 years or older. The first upper and lower molars were the most endodontically treated teeth. The most prevalent etiological factor was dental caries.

Zargar N et al¹⁵ evaluated the composition of microbiota of irreversible pulpitis and primary endodontic infections with respect to clinical and radiographic findings by performing cultures and 16s rDNA sequencing in Iranian patients. In this prospective cross-sectional study, samples were collected from 41 root canals for 4 main groups of patients. Bacterial identification was performed by the polymerase chain reaction (PCR) and 16s rDNA sequencing of aerobic and anaerobic cultivable colonies taken from patients' culture plates. Additionally, the presence of 13 bacterial species and 3 nonbacterial species was also explored using PCR and species-specific primers. Sixteen microbial species, 1 fungus (*Candida albicans*), and 1 virus (*Herpes simplex virus*) were discovered and isolated. Species with the highest prevalence were *Dialister invisus* (68.3%), *Porphyromonas gingivalis* (58.8%), *Streptococcus salivarius* (58.5%), and *Treponema denticola* (56.1%). *Lysinibacillus fusiformis* (19.1%) was detected in the root canals for the first time. *Candida albicans* was seen in 11 cases (26.8%). *Herpes simplex virus* (HSV) was seen in 4 patients (9.8%). Their results suggest that Gram-negative anaerobic oral bacteria are the majority of the microbes in primary endodontic infections. Various combinations of bacterial species were related to different clinical and radiographic conditions. *Lysinibacillus fusiformis* was detected for the first time in primary endodontic infections.

Conclusion

The findings of this study concluded that prevalence of irreversible pulpitis was 59%.

References

1. Kakehashi S, Stanley HR, Fitzgerald RJ. The effects of surgical exposures of dental pulps in germ-free and conventional laboratory rats. *Oral Surg Oral Med Oral Pathol.* 1965;20:340–9.
2. Abbott PV. Classification, diagnosis and clinical manifestations of apical periodontitis. *Endodontic Topics.* 2004;8:36–54.
3. Nair PNR. Apical periodontitis: a dynamic encounter between root canal infection and host response. *Periodontology 2000.* 1997;13:121–148.
4. Dias Almeida R, Negreiros Nunes A, Gois Brito G, Costa Soares G, de Barros Silva P, Marinho Bezerra T. Prevalence of apical periodontitis and root-filled teeth in 2500 panoramic radiographs of a Brazilian population sample. *J Health Biol Sci.* 2021;9:1–8.
5. Abbott PV. Assessing restored teeth with pulp and periapical diseases for the presence of cracks, caries and marginal breakdown. *Aust Dent J.* 2004;49:33–39.
6. Nair PNR, Pajarola G, Schroeder HE. Types and incidence of human periapical lesions obtained with extracted teeth. *Oral Surg Oral Med Oral Pathol Oral RadiolEndod.* 1996;81:93–102.
7. Love RM. Intraradicular space: what happens within roots of infected teeth? *Ann R Australasian Coll Dent Surg.* 2000;15:235–9.
8. Eriksen HM, Berset GP, Hansen BF, Bjertness E. Changes in endodontic status 1973-1993 among 35-year-olds in Oslo, Norway. *Int Endod J.* 1995;28:129–32.
9. Park J.S., Jasani B., Patel J., Anthonappa R.P., King N.M. Efficacy of Alternative Medicaments for Pulp Treatment in Primary Teeth in the Short Term: A Meta-analysis. *J. Evid.-Based Dent. Pract.* 2019;19:101309.
10. Silva A.A., Belladonna F.G., Rover G., Lopes R.T., Moreira E.J.L., De-Deus G., Silva E. Does ultraconservative access affect the efficacy of root canal treatment and the fracture resistance of two-rooted maxillary premolars? *Int. Endod. J.* 2020;53:265–275.
11. Dammaschke T., Leidinger J., Schäfer E. Long-term evaluation of direct pulp capping--treatment outcomes over an average period of 6.1 years. *Clin. Oral Investig.* 2010;14:559–567.
12. Lin L.M., Ricucci D., Saoud T.M., Sigurdsson A., Kahler B. Vital pulp therapy of mature permanent teeth with irreversible pulpitis from the perspective of pulp biology. *Aust. Endod. J.* 2020;46:154–166.
13. Ricucci D., Siqueira J.F., Jr., Li Y., Tay F.R. Vital pulp therapy: Histopathology and histobacteriology-based guidelines to treat teeth with deep caries and pulp exposure. *J. Dent.* 2019;86:41–52.
14. Pérez AS, Bolado EC, Camacho-Aparicio LA, Hervert LP. Prevalence of pulp and periapical diseases in the endodontic postgraduate program at the national autonomous University of Mexico 2014-2019. *J Clin Exp Dent.* 2023 Jun 1;15(6):e470-e477.
15. Zargar N, Ashraf H, Marashi SMA, Sabeti M, Aziz A. Identification of microorganisms in irreversible pulpitis and primary endodontic infections with respect to clinical and radiographic findings. *Clin Oral Investig.* 2020 Jun;24(6):2099-2108.