Content available at: https://www.ipinnovative.com/open-access-journals

IP Indian Journal of Conservative and Endodontics

Journal homepage: https://www.ijce.in/

Editorial

Endodontic microbiology: Mandate to the path of endodontic success

Gaurav Jain [1,*]

[1] *Dept. of Conservative Dentistry and Endodontics, Saraswati Dental College, Lucknow, Uttar Pradesh, India*

ARTICLE INFO

Article history:
Received 21-09-2022
Accepted 01-10-2022
Available online 07-10-2022

The best treatment of any ailment is to eradicate or resolve the root cause of the problem. Similarly, while success of endodontic therapy depends on multiple factors like efficiency of disinfection protocol, effective cleaning, shaping and debridement of root canal space followed by impervious coronal and apical seal; the microbiological profile of the infection is one of the most important factor to be considered and hence must guide the treatment protocol, towards success.

Primary endodontic infection has poly-microbial profile, with infectionic success in long term. causing initial colonizers that invade and colonize the necrotic pulp and dominated by anaerobic bacteria.[1,2] In contrast, persistent infection exhibits microbial flora that, in some way, resist intracanal antimicrobial agents, survive periods of nutrient deprivement in treated canals,[3] and are the reason for secondary infections showing predominantly presence of Enterococcus faecalis.[4]

Primary infection occurs as a result of carious or traumatic exposure of coronal pulp or any other breach in the hard tissue integrity of the tooth structure. Microbes, once proliferated, can lead to acute or chronic conditions, depending on their virulence and host tissue defense mechanism. Majority of these microbes during this phase are anaerobes, comprising of 10 to 30 species per canal. While total bacterial counts may vary from 103 to 108 cells per infected canal.[3]

* *Corresponding author.*
E-mail address: gauravjs23@yahoo.com (G. Jain).

However, secondary infection within the root canal system starts after the treatment of the affected tooth is initiated,[5] due to invasion of microbes in cases with possible leakage from temporary fillings during inter-appointment periods or defective permanent restoration, improper periapical seal etc. Moreover, microorganism like E. faecalis, harbor within the dentinal tubules and evade the action of all antimicrobial agents and medicaments and lie in a dormant state in the canal dentinal walls, becoming active on getting favorable local environment.

Microbiological profile of the root canal system before obturation shows the species of bacteria that survive the chemo-mechanical preparation of the canal. It has been observed that an average of 1 to 5 bacterial species have been found in the root canals after completion of cleaning and shaping procedure and the counts were found to be reaching up to 102 to 105 cells per canal,[3] with presence of predominantly anaerobic rods such as F. nucleatum, Prevotella species, and C. rectus or Gram-positive bacteria such as Streptococci (S. mitis, S. gordonii, S. anginosus, S. sanguinis, and S. oralis), P. micra, Actinomyces species (A. israelii and A. odontolyticus), Propioni bacterium species (P. acnes and P. propionicum), P. alactolyticus, Lactobacilli (L. paracasei and L. acidophilus) and E. faecalis.[6,7]

While most extra-radicular infections are a common sequelae to intraradicular infections, Actinomyces species causing apical actinomycosis is an example of extra-radicular infection independent of the intraradicular infections.[8]

https://doi.org/10.18231/j.ijce.2022.022

Moreover, in cases of endodontic flare ups, amongst possible mechanical, chemical or microbial injury to the pulp and peri-radicular tissues, bacteriological etiology is an important aspect. Chavez de Paz revealed in his study that F. nucleatum is associated with cases of flare-up showing pain and swelling. Other microbes isolated with flare-ups were Gram negative obligate anaerobic rods belonging to the genera Prevotella and Prophyromonas (Black pigmented bacteria).[9]

The micro biota in all the afore-mentioned instances differ, even if not majorly. It highlights the need to focus the disinfection regimen as the key player in each scenario to best accomplish complete eradication or an ideal disinfection of the root canal space. The microbiological profile might light the path to the appropriate irrigation protocol to be employed, with use of an adequate intracanal medicament (agent, vehicle and duration) as per the situation. So, the little ones – the microbes, here might actually be the better guide to endodont

Conflict of Interest

None.

References

1. Munson MA, Pitt-Ford T, Chong B, Weightman A, Wade WG. Molecular and cultural analysis of the microflora associated with endodontic infections. *J Dent Res*. 2002;81(11):761–6.
2. Siqueira JF, Rôças IN. Diversity of endodontic microbiota revisited. *J Dent Res*. 2009;88(11):969–81.
3. Siqueira JF, Rôças IN. Distinctive features of the microbiota associated with different forms of apical periodontitis. *J Oral Microbiol*. 2009;doi:10.3402/jom.v1i0.2009.
4. Siqueira JF, Rôças IN. Polymerase chain reaction based analysis of microorganisms associated with failed endodontic treatment. *Oral surg Oral Med Oral Pathol Oral Radiol Endod*. 2004;97(1):85–94.
5. Fouad AF. Endodontic microbiology and pathobiology: current state of knowledge. *Dent Clin North Am*. 2017;61(1):1–15.
6. Peciuliene V, Reynaud AH, Balciuniene I, Haapasalo M. Isolation of yeast and enteric bacteria in root filled teeth endodontic with chronic apical periodontitis. *Int Endod J*. 2001;34(6):429–34.
7. Siqueira JF, Rôças IN. Present status and future directions: Microbiology of endodontic infections. *Int Endod J*. 2022;55(3):512–30.
8. Singh H. Microbiology of endodontic infections. *J Dent Oral Health*. 2016;2(5):1–4.
9. e ES, e RM. Pain and flare-up after endodontic treatment procedures. *Stomatologija*. 2014;16(1):25–30.

Author biography

Gaurav Jain, Associate Professor
https://orcid.org/0000-0003-0122-9272

Cite this article: Jain G. Endodontic microbiology: Mandate to the path of endodontic success. *IP Indian J Conserv Endod* 2022;7(3):103-104.