

Stereological characterization of odontoblasts in normal healthy and reversible pulpitis in human dental pulps [Caracterización estereológica de odontoblastos en pulpas dentarias humanas sanas y con pulpitis reversible]

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Dentinal reaction and repair depends on factors like the amount of odontoblasts. Methods for obtaining reliable estimates of the number of odontoblasts in the dental pulp have been subjective and biased, especially when assessing the potential quantitative changes and reparative capacity in the presence of cavities. The aim of this study was to estimate and quantitatively compare, through stereological tools, the number, density and volume of odontoblasts in healthy teeth, diagnosed with reversible pulpitis due to caries. We used human premolars obtained from extractions, divided into groups of healthy teeth and teeth with caries, fixed and decalcified in 5% nitric acid. Following the orientator protocol, five 5-mm-thick sections stained by HE were obtained from each tooth.

Stereological counting for odontoblast with M42 multipurpose test was applied. Numerical density (Nv), volume density (Vv) and surface density (Sv) were estimated, and the mean (\pm SD) for each tooth, and Mean (\pm SE) per group were calculated. Differences between groups were analyzed by t test, with $p < 0.05$ for statistical significance. In the healthy teeth group, the mean (\pm SE) for Nv was $0.409 \times 10^5 / \text{mm}^3$ ($\pm 0.018 \times 10^5 / \text{mm}^3$), Vv 19.714% ($\pm 1.43\%$) and to Sv $21.016 \text{ mm}^2 / \text{mm}^3$ ($\pm 1.425 \text{ mm}^2 / \text{mm}^3$) odontoblast cells. In the caries teeth group, the Nv was $0.521 \times 10^5 / \text{mm}^3$ ($\pm 0.023 \times 10^5 / \text{mm}^3$), Vv 24.686% ($\pm 1.625\%$) and Sv $23.203 \text{ mm}^2 / \text{mm}^3$ ($\pm 1.364 \text{ mm}^2 / \text{mm}^3$). When comparing Nv, an increased in odontoblasts significantly ($p = 0.0062$), as well as Vv ($p = 0.0197$) in caries teeth group. There is an increased number of odontoblasts in teeth with reversible pulpitis, which would condition its responsiveness. The methodology can be applied to determine pulp behavior, and quantify variables of odontoblastic response in atraumatic restorative treatments in an impartial and reproducible form.

Dental pulp

Human tooth

Odontoblast

Stereology