Accuracy of Clinical Pulp Diagnosis in Primary Teeth

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BACKGROUND

- The 2009 American Association of Endodontists (AAE) criteria to diagnose pulp health is the most widely accepted.
- There is a lack of studies evaluating the accuracy of the AAE diagnostic criteria for diagnosing pulpal health in primary teeth.
- This study aimed to evaluate the correlation between the clinical diagnosis of reversible pulpitis and irreversible pulpitis in primary teeth based on the 2009 AAE diagnostic criteria and the individual factors within the diagnostic criteria with histological pulp findings.

METHODS

- Ethics approval number (DSRB 2020/00216).
- Eighty primary teeth (clinically diagnosed with normal pulp (n=10), reversible pulpitis (n=30), irreversible pulpitis (n=30), and pulp necrosis (n=10) that were planned for extraction by the treating dentist were collected.
- Consent and assent (6+) were obtained.
- The teeth were histo-processed, and pulp tissues diagnosed histologically as uninflamed pulp, reversible or irreversibly inflamed, and necrosis based on a previously proposed criteria[3,8]
- Sensitivity, specificity and predictive values were computed to determine the diagnostic power of clinical diagnosis.

FIGURES

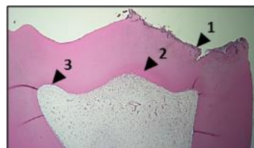

Figure 1. A section of a tooth with histological diagnosis of reversible pulp inflammation. *1*: Caries front; Tertiary dentin is present in *2* and absent in *3*

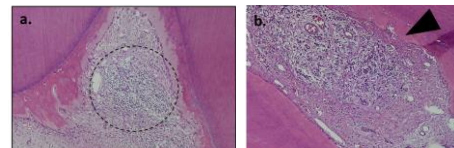

Figure 2. Sections of a tooth with histological diagnosis of irreversible pulp inflammation (a) Coronal pulp and (b) Radicular pulp showing abundant polymorphonuclear cells.

Figure 3. Section of a tooth with histological diagnosis of necrosis. There are no signs of viable cells in the pulp chamber *1*: Caries front

RESULTS

Table 1. Sensitivity, Specificity, Positive and Negative Predictive Values of the Clinical Diagnosis

Clinical diagnosis	Histological Diagnosis	Sensitivity, *Se*	Specificity, *Sp*	Positive Predictive Value, *PPV*	Negative Predictive Value, *NPV*
Normal pulp	Uninflamed pulp	91%	100%	100%	99%
Reversible pulpitis	Reversible pulp inflammation	65%	86%	80%	74%
Irreversible pulpitis	Irreversible pulp inflammation	64%	72%	47%	84%
Pulp Necrosis	Necrosis	70%	96%	70%	96%

- Teeth with histologically diagnosed irreversible pulp inflammation were more likely to have lingering (OR 5.08; 95%CI:1.48-17.46, P=0.010) and nocturnal tooth pain (OR 15.86; 95%CI:1.57-160.47, P=0.019) when compared to teeth with reversible pulp inflammation.
- The most useful predictors were the presence or absence of widened periodontal ligament space and nocturnal tooth pain. The accuracy of this CART prediction model is 78%.

CONCLUSION

The 2009 AAE criteria was acceptable for primary teeth with pulp necrosis and normal pulp but poor for reversible pulpitis and irreversible pulpitis.

The presence of widened PDL space and nocturnal tooth pain are the two pertinent factors that can potentially guide clinicians when differentiating between reversible and irreversible pulpitis.