

Diagnostic and Prognostic Predictors for the Success of Pulpotomy in Permanent Mature Posterior Teeth with Moderate to Severe Pulpitis: A Scoping Review

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Table S1. Definitions from the textbook by Kirkwood and Sterne [124].

Sensitivity	Proportion of true positives correctly identified
Specificity	Proportion of true negatives correctly identified
Positive predictive value	Proportion of test positives that are truly positive
Negative predictive value	Proportion of test negatives that are truly negative

Table S2. Contingency table developed from the information in Sharma et al. [48].

	Standard /disease			
	Pulpotomy fail Positive	Pulpotomy success Negative	Total	
Positive $\geq 334.8\text{ng/mL}$ MMP-9	5	6	11	PPV = $5/11 = 45.5\%$
Negative $<334.8\text{ng/mL}$ MMP-9	0	29	29	NPV = $29/29 = 100\%$
Total	5	35	40	
	Sensitivity = $5/5 = 100\%$	Specificity = $29/35 = 83\%$		

Legend: NPV, negative predictive value, PPV, positive predictive value

The paper by Sharma et al. [48] states that the cut-off MMP-9 concentration ([MMP-9]) to predict the outcome (success or failure) of a complete pulpotomy is 334.8 ng/mL ie a positive test result of ≥ 334.8 ng/mL predicts pulpotomy failure and a negative result of <334.8 ng/mL predicts pulpotomy success. They identified a sensitivity value of 100% and a specificity value of 83%. Forty pulpotomies were performed, of which 35 were successful and 5 failed. As seen in Table 4, the number of true negatives (29) was calculated based on $x/35=83\%$ (where x is the number of true negatives). The number 6 in the table is the number of false test positives and was calculated to add up to the total number of cases that were a success (35). The number of false test positives is the number of cases predicted to fail that were actually a success.

According to the above table, the following statement in the paper is incorrect; “The 83% specificity of the test suggests that only 17% of teeth with aMMP-9 concentration ≥ 334.8 ng mL⁻¹ will have a successful outcome after pulpotomy.” This is because 6 of a total of 11 cases (54.5%) that had a [MMP-9] of ≥ 334.8 ng/mL were actually successful. In fact, only 5 out of 11 failures were correctly predicted by the test to fail, resulting in a positive predictive value of 45.5%. In summary, of the teeth where the test indicated no pulpotomy should be performed, more than half could have had a successful pulpotomy.

If the findings of this paper alone were used to develop a chairside diagnostic test, an MMP-9 concentration of ≥ 334.8 ng/mL would encourage the clinician to not perform the pulpotomy despite half of these cases potentially being a success.