

# Solvents and cyclic fatigue resistance of instruments in “S”- shaped canals

Inês Ferreira<sup>1,2\*</sup>, Ana Cristina Braga<sup>3</sup>, Irene Pina Vaz<sup>1</sup>



0118



1 Faculty of Dental Medicine, University of Porto, Porto, Portugal

2 Faculty of Medicine, University of Porto, Porto, Portugal

3 ALGORITMI Center, Department of Production and Systems, University of Minho, Braga, Portugal

## AIM

To evaluate the influence of an association of solvents on the resistance to cyclic fatigue fracture of WaveOne Gold, Hyflex EDM and Hyflex CM, in dynamic immersion, comparing to sodium hypochlorite (NaOCl), ethylenediaminetetraacetic acid (EDTA) and no immersion, in an artificial stainless root canal with a double (S-shaped) curvature. There was also the purpose to compare the resistance to cyclic fatigue of the different file systems.



## MATERIALS AND METHODS

A total of 96 unused WaveOne Gold primary (25.07), HyFlex EDM (25/~) and HyFlex CM (25.04) were tested in an artificial stainless root canal with a double (“S”-shaped) curvature (first curve of 60° curvature and 5-mm radius and the second one of 60° curvature and 2-mm radius). The files of each brand were randomly assigned to four groups (n=8) and submitted to the following immersion protocols: no immersion, (control), 3% NaOCl, 17% EDTA and solvent association (Methylethylketone + Tetrachloroethylene), being rotated until fracture. Resistance to cyclic fatigue was determined by recording time to fracture, in seconds. Statistical analysis was performed by a one-way ANOVA using a decision rule for  $p < 0.05$ .

## RESULTS

Resistance to cyclic fatigue was not significantly affected by immersion in the solvent association or different irrigating solutions (NaOCl; EDTA) ( $p = 0.858$ ). Hyflex CM had the highest cyclic fatigue resistance followed by Hyflex EDM and WaveOne Gold ( $p < 0.05$ ).

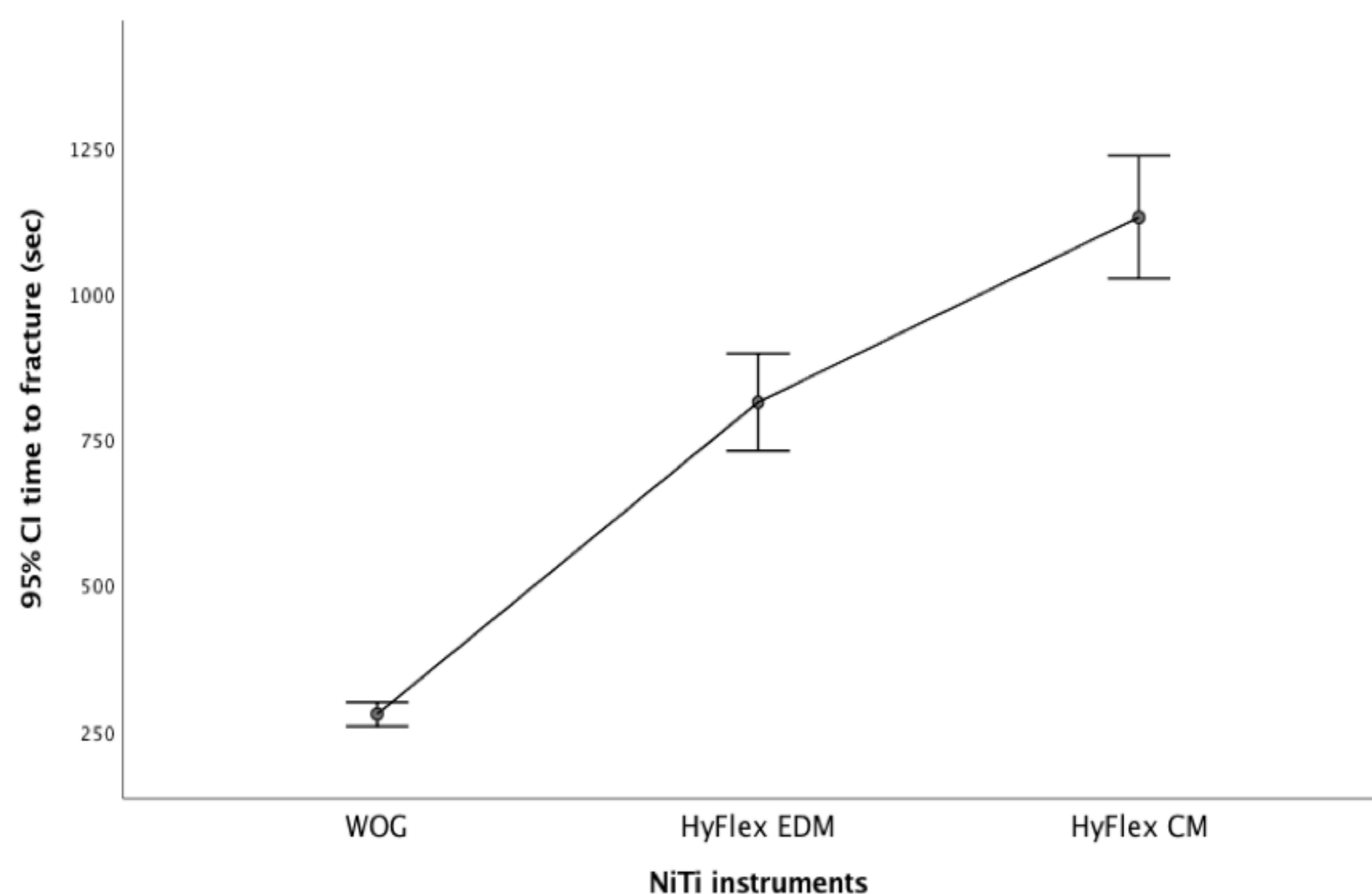
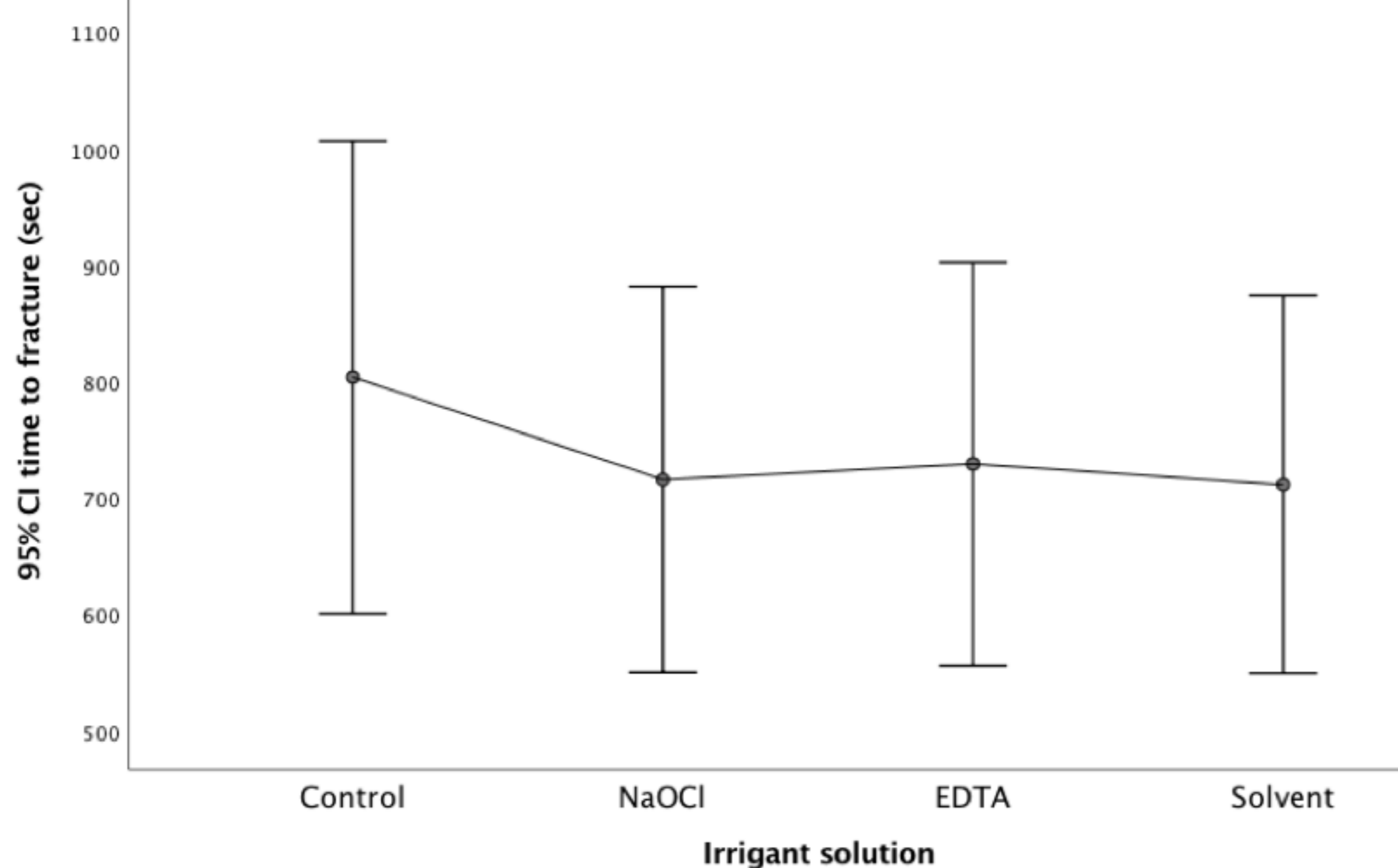


Fig 1. Mean differences between values obtained with different irrigant solutions

Fig 2. Mean differences between values obtained different file systems

## CONCLUSIONS

Within the limitations of the present study, in “S”-shaped artificial canals, the solvent association (Methylethylketone + Tetrachloroethylene) do not influence the cyclic fatigue resistance of WaveOne Gold and Hyflex EDM or CM files. Hyflex CM file showed the highest cyclic fatigue resistance.

Acknowledgment:



Portuguese Society of Stomatology and Dental Medicine  
BOLSA SPEMD DE APOIO À DIVULGAÇÃO CIENTÍFICA

