ABSTRACT

The root canal treatment has become easier, faster and more predictable when using rotary instrumentation. However, despite numerous advances in terms of evolution in instrument characteristics, heat treatments, design, among others, the possibility of fracture still exists, which makes it important to know the mechanical characteristics of these instruments for their best use. **Objective:** The objective of this paper was to evaluate the cyclic fatigue, torsional behavior and flexural strength of EdgeTaper Platinum, Flat File, TruNatomy, Univy New, Genius Proflex, Vortex Blue, Logic 2 and Hyflex CM systems. **Methods:** The evaluated instruments were submitted to static and torsional cyclic fatigue tests in specific apparatus for each type of test. **Results:** Regarding cyclic fatigue, the GS 25.04 instrument presented significantly greater time and number of cycles than the other instruments evaluated. There were no differences between HX 25.06, FF 25.04, LOG 25.05 and VB 25.06, however, there was a significant difference between TN 26.04 and UY 25.06, as well as, between ETP 25.06 and HX 25.06. Regarding torque values, UY 25.06 and VB 25.06 had significantly higher values, followed by ETP 25.06, FF 25.04 and LOG 25.05 while GS 25.04, TN 26.04 and HX 25.06 had significantly lower values, with no difference among them. As for the angular deflection, LOG 25.5 and GS 25.04 had significantly higher values followed by ETP 25.06, FF 25.04, TN 25.04, and HX 25.06. The instruments UY 25.06 and VB 25.06 had the lowest values among the other groups ($P<0.05$).

Keywords: cyclic fatigue, torsional fatigue, NiTi alloy, heat treatment NiTi alloys. rotary systems