ABSTRACT

Effect of image processing on the differential diagnosis of jaw bone lesions

The aim of this study was to investigate the diagnostic accuracy of five images of odontogenic keratocysts and five images of simple bone cysts (panoramic radiograph, RP, and cone beam computed tomography, CBCT) submitted to image processing. Image panels were mounted for each lesion for examiner analysis using a questionnaire. The images were processed with different enhancement features offered by the GIMP software (edge enhancement and smoothing filters). Thus, a total of 20 RP and 20 CBCT scans were obtained (20 panoramic, 10 with processing and 10 without processing, and 20 cone beam CT images, 10 with processing and 10 without processing). The analysis of the projected images was performed by 8 examiners with previous knowledge of dental radiology and imaging by applying a questionnaire. This study showed that image processing was not a predictive factor of correctness in any questionnaire ($p = 0.642$ and $p = 0.678$), on the other hand, the type of lesion ($p < 0.001$) and the type of image were ($p = 0.004$). The PR images had a higher chance of correct answers compared to CBCT images (OR=3.033, CI=1.418-6.487). Through the results of this research, we conclude that although image processing was not a predictive factor of correctness in both questionnaires, the type of image acquisition was. In addition, the type of lesion had a significant impact on matching.

Keywords: Odontogenic cysts, Diagnostic imaging, Cone-Beam Computed Tomography, Panoramic radiography.