

## Reliability of Retinopathy of Prematurity Diagnosis by Analyzing Digital Images Using Telemedicine System

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**Purpose:** To evaluate interobserver's concordance in retinopathy of prematurity diagnosis and treatment by analyzing digital images.

**Materials and Methods:** Descriptive, comparative observational study. The study sample was made up of 14 reconstructed retinal pictures obtained in 5 eyes of 3 low-birth-weight infants taken using a wide-angle fundus digital camera Retcam 120 (Clarity Medical Systems, Pleasanton, CA). All the images were examined by 1 experienced ophthalmologist and 6 ophthalmologist trained previously in digital image analysis. Retinographies were graded according to the systems International Classification of Retinopathy of Prematurity revisited (ICROP) and Early Treatment for Retinopathy of Prematurity (ETROP). Interobserver's concordance was assessed for each of the 6 specialist ophthalmologists regarding the ROP.

**Results:** Interobserver's reliability analysis showed the following kappa values for the variable TREATMENT:  $k_1=-0.36$ ;  $k_2=0$ ;  $k_3=-0.36$ ;  $k_4=0$ ;  $k_5=-0.92$  y  $k_6=-0.67$ . In DIAGNOSIS, variables were characterized location ( $k_1=0.54$ ;  $k_2=-0.25$ ;  $k_3=-0.54$ ;  $k_4=-0.25$ ;  $k_5=0.12$ ;  $k_6=-0.25$ ), degree of involvement ( $k_1=-0.25$ ;  $k_2=-0.25$ ;  $k_3=-0.25$ ;  $k_4=-0.66$ ;  $k_5=-0.25$ ;  $k_6=-0.66$ ) and presence of plus disease associated ( $k_1=-0.36$ ;  $k_2=0$ ;  $k_3=-0.36$ ;  $k_4=0$ ;  $k_5=0$ ;  $k_6=0$ ). The reliability measured by Kappa index followed the rule: 0.81 to 1.00 (Excellent), 0.61–0.80 (Good) and 0.41 to 0.60 (Moderate), 0.21–0.40 (Low), <0.20 (Bad).

**Conclusions:** Kappa's indexes obtained for the interobserver analysis show imprecise reliability. Therefore, for decision-making through telemedicine system, there is the need to include in the evaluation of the images the criterion of at least 3 trained or experienced ophthalmologists.