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### **Prediction of Malignancy in Ocular Surface Epithelial Lesions: Prognostic Parameters Based on the 2001 Bethesda System.**

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**Purpose:** to develop the first scoring system for clinical use in predicting malignancy by impression cytology (IC) and to assess its validity. **Methods:** a transversal prospective observational study was conducted: IC was performed on epithelial lesions surface with premalignant or malignant clinical signs and without previous topical chemotherapy. Specimens that exhibited atypical cells on optical microscopy analysis were included and evaluated in a manner similar to that used in the 2001 Bethesda system for cervical citopathology. For each sample, 11 prognostic parameters were assessed to verify cytological features that are the most predictive of malignancy. Lesions were excised and submitted to histopathological study in which consensus existed regarding the diagnosis between two experienced ocular pathologists. Histopathology was considered gold-standard. Logistic regression was used for modeling results and receiver operating characteristic curve (ROC) analysis assessed the validity of the scoring system. **Results:** 39 lesions were studied and histopathological diagnosis was pterygium in 1 case, actinic keratosis in 9 cases, intraepithelial neoplasia in 9 cases and invasive squamous cell carcinoma in 20 cases. On the basis of the statistical probability to predict malignancy 7 prognostic parameters were included: nuclear size, chromatin, nucleoli, sincial-like group, nucleus cytoplasmic ratio, cytoplasmic stain and cytoplasmic borders. Each parameter was assigned a numerical value based on the strength of logistic regression and the summation was the total predictive score tabulated for each lesion. ROC curve analyses demonstrated an area under the curve of 0,927 and a score of 4,25 as the cutoff that best discriminates invasive malignant lesion (sensitivity of 95%, specificity of 93%, positive predictive value of 95% and negative predictive value of 93%). A score of 4,25 or more represents invasive squamous cell carcinoma, scoring 3,40 suggests malignant intraepithelial neoplasia and scoring 0,40 points to premalignant actinic keratosis. **Conclusions:** the study statistically validated the utility of this new IC-based score developed for the pretreatment prediction of malignancy in ocular surface epithelial lesions. Its predictive performance can be enhanced by prospective use and integration with clinical evaluation.

