

ABSTRACT

Purpose: The purpose of this study is to determine the validity of the retinal detachment open globe injury (RD-OGI) Score in the prediction of RD development after OGI as well as to make recommendations on how to use the RD-OGI Score for clinical decision-making, research and counselling eye trauma patients regarding likelihood of RD development. **Design:** Cohort study. **Participants:** 231 patients who presented to Eye Trauma Service of the Western Eye Hospital (London,UK), King's College Hospital (London,UK) and Massachusetts Eye and Ear Infirmary (Boston,USA) from 1 January 2012 to 31 January 2014 with open globe injury. **Methods:** A validation cohort was established by retrospectively reviewing the outcomes of 231 open globe injuries. The unconditional logistic regression was undertaken to evaluate optimal predictive value of RD-OGI Score. The sensitivity, the specificity, positive predictive value (PPV), negative predictive value (NPV) and probability of RD development were assessed for each RD-OGI Score cut point. RD - OGI Scores were stratified into three risk classes: Low Risk, Moderate Risk, and High Risk of RD development. Kaplan-Meier survival analysis for time to RD was plotted. A log-rank test was used to test differences in survival experience between risk classes. **Main Outcome Measure:** Progression to retinal detachment. **Results:** A total of 66 eyes were ultimately diagnosed with RD after open globe trauma in the validation cohort at 365 days. Regression modelling indicated that RD-OGI Score performs the best in predicting RD for the 30-day follow-up time point (AUC=0.939, AIC=108.8). However, this Score also performed extremely well at every other time point. The Low Risk Class was designated to be RD-OGI Score 0-1.5 and none of the patients developed RD in Low Risk Class over 365 days. Moderate Risk Class was designated as RD- OGI Scores 2.0 through 4.0 with probability of RD of 11- 20% at all time points, and High Risk Class at scores 4.5 through 7.5 with probability 66-78% at all time points. Survival experience was statistically significantly different depending upon the risk stratification (Log-rank chi-square = 110 on 2 degrees of freedom, $p = 0.0000$). **Conclusions:** The RD-OGI score can reliably predict the future development of detachment based on clinical variables that are seen at the time of initial presentation after traumatic injury. The Score can be stratified into three risk classes: Low, Moderate and High with different probabilities of RD development, RD prevalence and survival experiences among classes.

Key words: retinal detachment, open globe injury, RD- OGI score.