ABSTRACT

Background: Vision encompasses a large component of the brain's pathways, yet is not represented in current sideline testing.

Objectives: We performed meta-analyses of published data for a vision-based test of rapid number naming (King-Devick [K-D] test).

Methods: Pooled- and meta-analyses of 15 studies estimated pre-season baseline K-D scores and sensitivity/specificity for identifying concussed vs. non-concussed control athletes.

Results: Baseline K-D (n=1,419) showed a weighted estimate of 43.8 seconds (95% CI: 40.2, 47.5; $I^2=0.0\%$, $p=0.85$—very little heterogeneity). Sensitivity was 86% (96/112 concussed athletes had K-D worsening, 95% CI: 78%, 92%); specificity was 90% (181/202 controls had no worsening, 95% CI: 85%, 93%).

Conclusions: Rapid number naming adds to sideline assessment and contributes a critical dimension of vision to sports-related concussion testing.

Figure. Distribution of pre-season baseline time scores for the King-Devick (K-D) test. Dots represent point estimates of each study mean (or effect size, ES); sizes of the gray boxes reflect the weights of the studies in the meta-analysis. Bars are 95% confidence intervals (CI). The diamond shows the weighted estimate for the mean pre-season K-D baseline score; this is determined from fixed-effects models account for study N and precision (narrowness of 95% CI). $I^2$ (I-squared) statistic values were 0.0%, $p=0.85$, indicating very little heterogeneity between studies in calculation of the weighted estimate. Stated differently, the non-significance of the $I^2$ test for heterogeneity suggests that the differences between the studies are explicable by random variation.