

AGREEMENT AND CORRELATION BETWEEN MANUAL AND QUANTITATIVE PUPILLOMETRY IN NEUROCRITICAL PATIENTS

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INTRODUCTION

Pupil diameter, symmetry and reactivity evaluation is essential in neurocritical care. Manual assessment is highly variable between observers. Automated pupillometry provides a precise and objective measurement, although it is not yet widely adopted in clinical practice.

METHODOLOGY

Prospective observational study in a tertiary hospital ICU (Oct 2023–June 2024). Neurocritical patients were included, with 2 daily pupil exams over 5 days, using both manual and automated methods. Sociodemographic and clinical variables were collected. Statistical analysis included concordance and correlation coefficients.

OBJECTIVE

To evaluate the agreement and correlation in size, symmetry and PLR between manual and quantitative pupillometry in neurocritical patients.



RESULTS

394 pupil exams (n=31). Median age: 61 (Q1–Q3: 50–71.5), 54.8% men. Mean pupil diameter: manual 4.62 mm (SD 1.39) vs quantitative 3.86 mm (SD 1.79). Concordance for diameter ICC: 0.39 [CI 95%: 0.26–0.51]. Spearman's correlation: 0.72. For symmetry, concordance: 0.45 [CI 95%: 0.36–0.53]. RPL ICC: 0.09 [CI 95%: 0.04–0.14].

Figure 1. Bland-Altman plot and scatter plot of pupil diameter agreement.

Figure 2. Violin plot of pupil diameter.

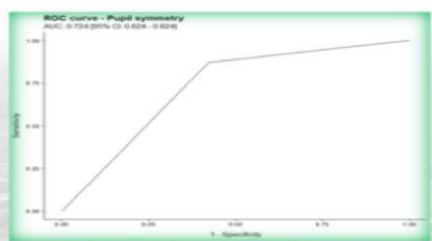
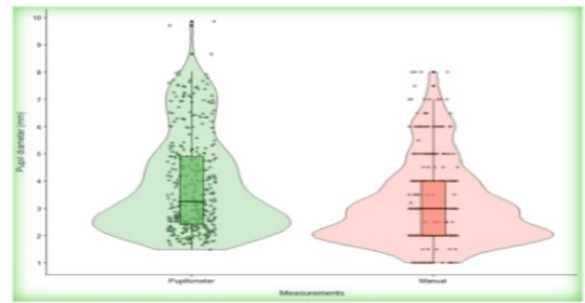
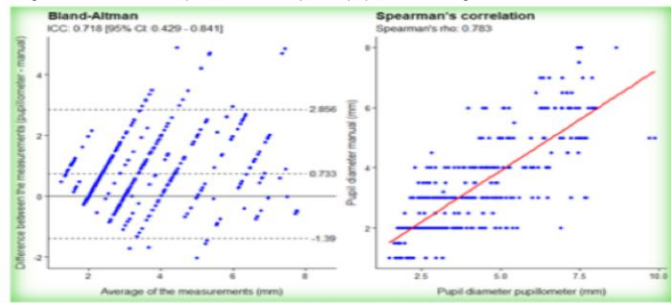


Figure 3. ROC curve: symmetry prediction via automated pupillometry.

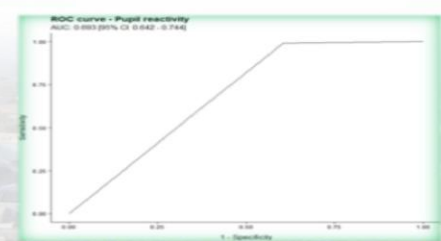


Figure 4. ROC curve: reactivity prediction via automated pupillometry.

CONCLUSIONS

Agreement and correlation between manual and quantitative pupillometry in neurocritical patients is low-to-moderate for size, symmetry and PLR. Further research should determine the clinical relevance of this discrepancy.

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