

COMPARATIVE ANALYSIS OF PUPIL MONITORING USING MANUAL VERSUS AUTOMATED PUPILLOMETRY IN A COHORT OF NEUROCRITICAL PATIENTS

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INTRODUCTION

Pupillary examination is essential in neurocritical patients. It is typically performed manually, but infrared pupillometers now allow automatic pupil monitoring.

OBJECTIVE

To compare pupil diameter, symmetry, and reactivity to light (PLR) using manual versus automated pupillometry in neurocritical patients.



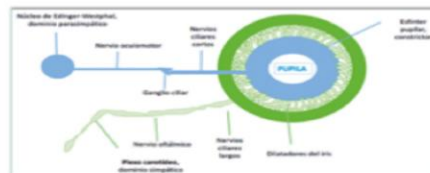
PUPILOMETRÍA MANUAL



PUPILOMETRÍA CUANTITATIVA AUTOMÁTICA

METHODOLOGY

Single-center, observational, prospective study in a neurocritical ICU between Oct 2023 and June 2024. Manual measurement was compared to automated (**NeuroLight AlgiScan® Idmed**). Asymmetry $>1\text{mm}$ and non-reactivity defined as $\text{PLR} <15\%$. Descriptive statistics were applied.



RESULTS

197 pupil exams ($n=394$) in 31 patients. Median age 61 (Q1–Q3: 50–71.5), 54.8% male. Mean pupil diameter: 3.13 mm ($\text{SD}=1.53$) manual, 3.86 mm ($\text{SD}=1.79$) automatic. Nurses identified anisocoria in 18.8% manually vs 13.2% automatically. Discordance in reactivity in 23.1% of exams ($p<0.001$).

Table 1. Comparison of pupil diameter, symmetry and reactivity using manual vs automated pupillometry

VARIABLES	Pupillometría MANUAL n= 197	Pupillometría AUTOMÁTICA n=197	p-valor
Diámetro (mm)			
- Pupila D, media (DE)	3,26 (1,58)	3,98 (1,80)	$<0,001$
- Pupila I, media (DE)	3,00 (1,46)	3,75 (1,78)	$<0,001$
- Global, media (DE)	3,13 (1,53)	3,86 (1,79)	$<0,001$
Simetría, % (n=197)			0,08 ¹
- Isocóricas	160 (81,2%)	171 (86,8%)	
- Anisocóricas	37 (18,8%)	26 (13,2%)	
Reactividad, %			$<0,001$ ¹
- Reactivas	355 (90,1%)	303 (76,9%)	
- No reactivas	39 (9,9%)	91 (23,1%)	

PLR: Reactividad a la luz.
p-valor calculado con el test de McNemar

CONCLUSIONS

Significant differences exist in pupil size, symmetry and PLR between manual and automated measurements. Their clinical impact should be further evaluated.



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