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MONITORING OF PUPILS USING AUTOMATED QUANTITATIVE PUPILLOMETRY IN AN INTENSIVE CARE UNIT

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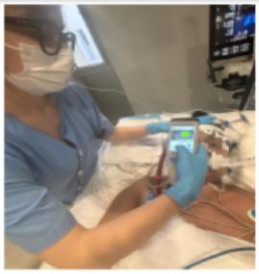
INTRODUCTION

Automated quantitative pupillometry has emerged in Intensive Care Units (ICUs) to reduce variability in pupil assessment. This test is particularly important in neurocritical patients.



OBJECTIVE

To evaluate the pupillary response in a cohort of neurocritical patients using automated quantitative pupillometry via infrared.

METHODOLOGY

A prospective observational study was conducted in a polyvalent ICU of a third-level hospital (October 2023 – June 2024). Neurocritical patients ≥18 years with brain injury were included. The Neurolight® pupilometer (IDMED, France) was used to measure 7 variables in 2 daily examinations of both pupils for 5 days. Sociodemographic and clinical variables were collected. Descriptive statistics were performed.

RESULTS

A total of 31 participants were included, median age 61 (Q1-Q3: 50.1–71.5), 54.8% male. 32.3% (n=10) were admitted due to subarachnoid hemorrhage. 197 pupil examinations (n=394) were performed. The mean diameter of the right and left pupils was 3.98 (DE=1.80) and 3.75 (DE=1.78) mm, respectively. 86.8% of pupils (n=171) were isochoric and 13.2% (n=26) anisocoric. 76.9% (n=303) were reactive, and 23.1% (n=91) were non-reactive. Median RPL reflex in the right eye: 21.7% [15.6–36.7]; left: 22.3% [16.4–39], amplitude: 0.85 mm [IQR: 1.64–2.3]. Median QPi was 2.2 [Q1-Q3: 1.4–3.5]. All non-reactive pupils had a QPi <3.

Tabla 1. Análisis de los resultados de la pupilometría cuantitativa

Variables	n= 394
Diámetro, media (DE)	
. Pupila D	3,98 (1,80)
. Pupila I	3,75 (1,78)
. Global	3,86 (1,79)
Simetría, % (n=197)	
. Isocóricas	171 (86.8%)
. Anisocóricas	26 (13,2%)
Reactividad, %	
. Reactivas	303 (76,9%)
. Arreactivas	91 (23,1%)
RPL, %	
. Pupila D	26,2 [14,5;37,5]
. Pupila I	28 [16,9;36]
. Global	27,2 [15,5;36,7]
Velocidad de contracción, mm/seg; mediana (Q1-Q3)	
. Pupila D	2,24 [1,13;4,22]
. Pupila I	2,36 [1,23;3,75]
. Global	2,3 [1,16;4,04]
Amplitud, mm; mediana (Q1-Q3)	
. Pupila D	-0,77 [-1,65;-0,35]
. Pupila I	-0,93 [-1,60;-0,39]
. Global	-0,85 [-1,64;-0,37]
Latencia, mm; mediana (Q1-Q3)	
. Pupila D	270 [239;309]
. Pupila I	272 [239;310]
. Global	272 [239;310]
QPI, mediana (Q1-Q3)	4 [3-5]

RPL: Reactividad pupilar a la luz, QPI: *Quantitative Pupillometry Index*

Tabla 2. . Relación entre el QPI y la reactividad de las pupilas

	Arreactiva (n=91)	Reactiva (n=303)	p-valor
QPI			<0,001
Mayor que 3	0 (0%)	258 (85,1%)	
Menor o igual a 3	91 (100%)	45 (14,9%)	

QPI: Quantitative Pupillometry Index

CONCLUSIONS

Quantitative pupillometry is easy to implement and allows more complete, accurate, and objective measurement of changes in pupil diameter, symmetry, and reactivity at the bedside.

BIBLIOGRAPHY

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