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## BACKGROUND

Levetiracetam (LEV) is increasingly used in the elderly due to its favorable pharmacokinetic profile, good tolerability and no significant drug-drug interactions. LEV is mainly eliminated from the systemic circulation by renal excretion so in aged patients LEV clearance is expected to be reduced because of the physiological reduction in glomerular filtration rate.

## PURPOSE

To compare basal serum levels (BSL) and apparent steady-state oral clearance (CL/F) of levetiracetam in elderly versus non-elderly patients with epilepsy.

## MATERIAL AND METHODS

- Retrospective study, from 2009 to 2013, in adult patients with epilepsy treated with LEV in a Spanish tertiary hospital.
- Inclusion criteria:** age  $\geq 16$  years; treatment with LEV for at least 1 month and a steady-state serum concentration of LEV obtained before morning dose.
- Exclusion criteria:** Proved or suspected non adherence of treatment.
- Patients were grouped according to age: group **A** (16-30 years), **B** (31-50 years), **C** (51-65 years) and **D** (>65 years).
- Basal serum concentrations ( $C_0$ LEV) were measured by high-performance liquid chromatography (HPLC).
- Software Stata<sup>®</sup> version 12 was used for statistical analysis. The level of significance was set at  $p < 0.05$ .

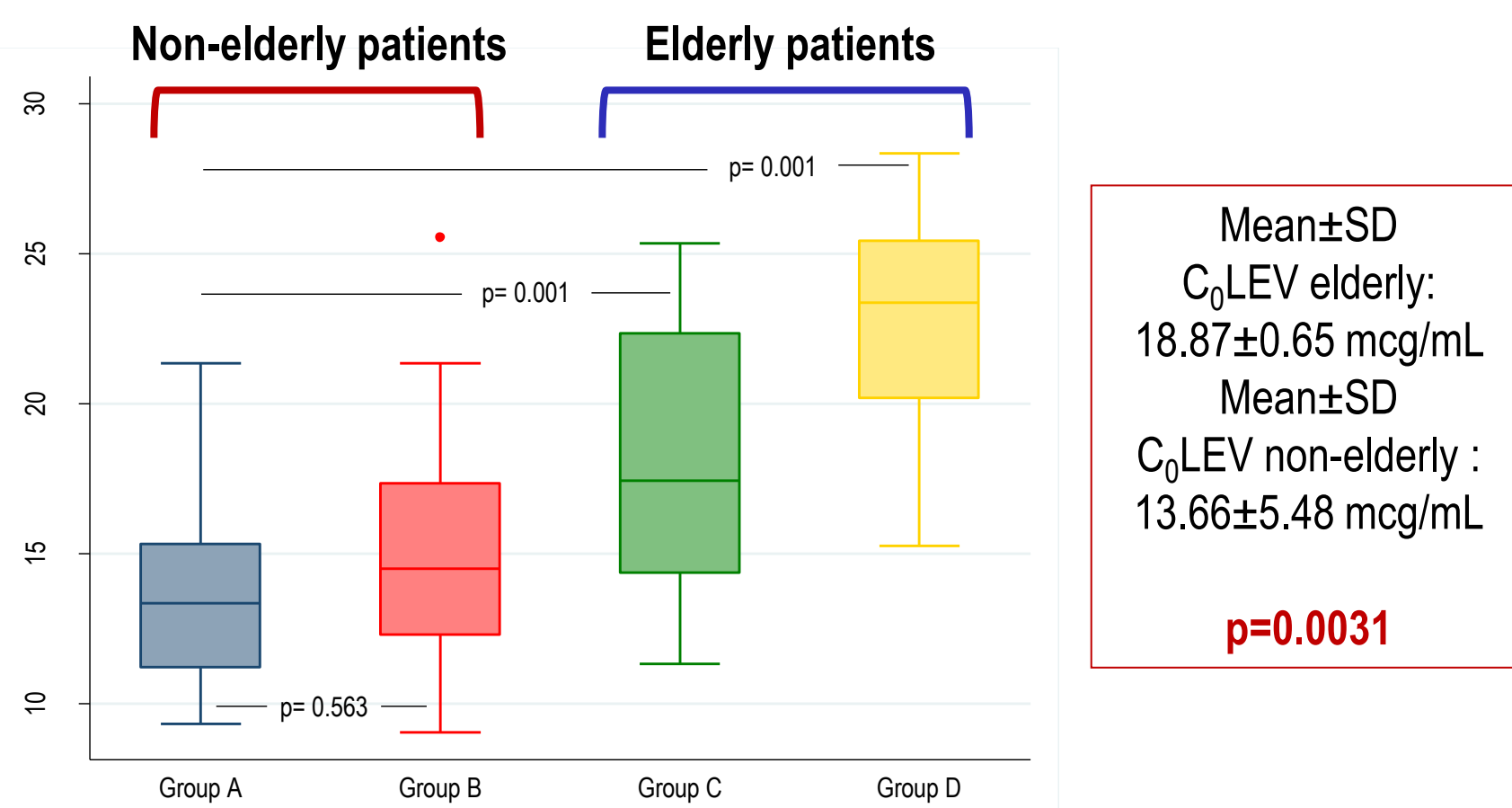
## RESULTS

**Table 1: Dose and basal serum levels of LEV by age groups.**

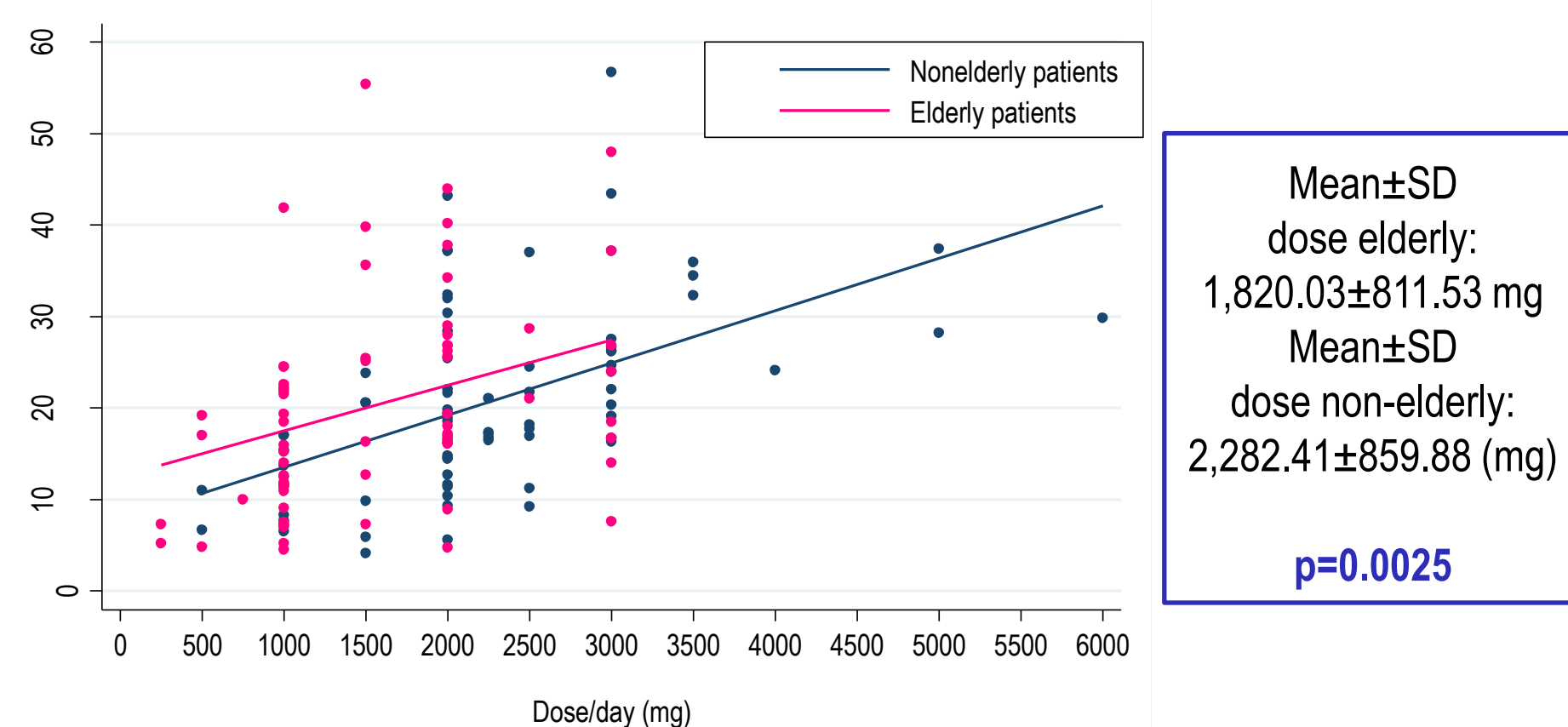
Group	n	$C_0$ LEV (mcg/mL)	CL/F LEV (mL/min/Kg)	Dose / day (mg)
<b>A</b>	93	13.32 $\pm$ 4.54	1.45 $\pm$ 0.76	2,182.35 $\pm$ 970.07
<b>B</b>	131	14.01 $\pm$ 6.43	1.41 $\pm$ 0.85	2,382.47 $\pm$ 749.69
<b>C</b>	90	17.54 $\pm$ 5.45*	1.18 $\pm$ 0.83	2,018.98 $\pm$ 848.99
<b>D</b>	66	20.21 $\pm$ 8.34**	0.95 $\pm$ 0.68	1,621.09 $\pm$ 774.07

\*Statistically significant differences between C and A, B, D.

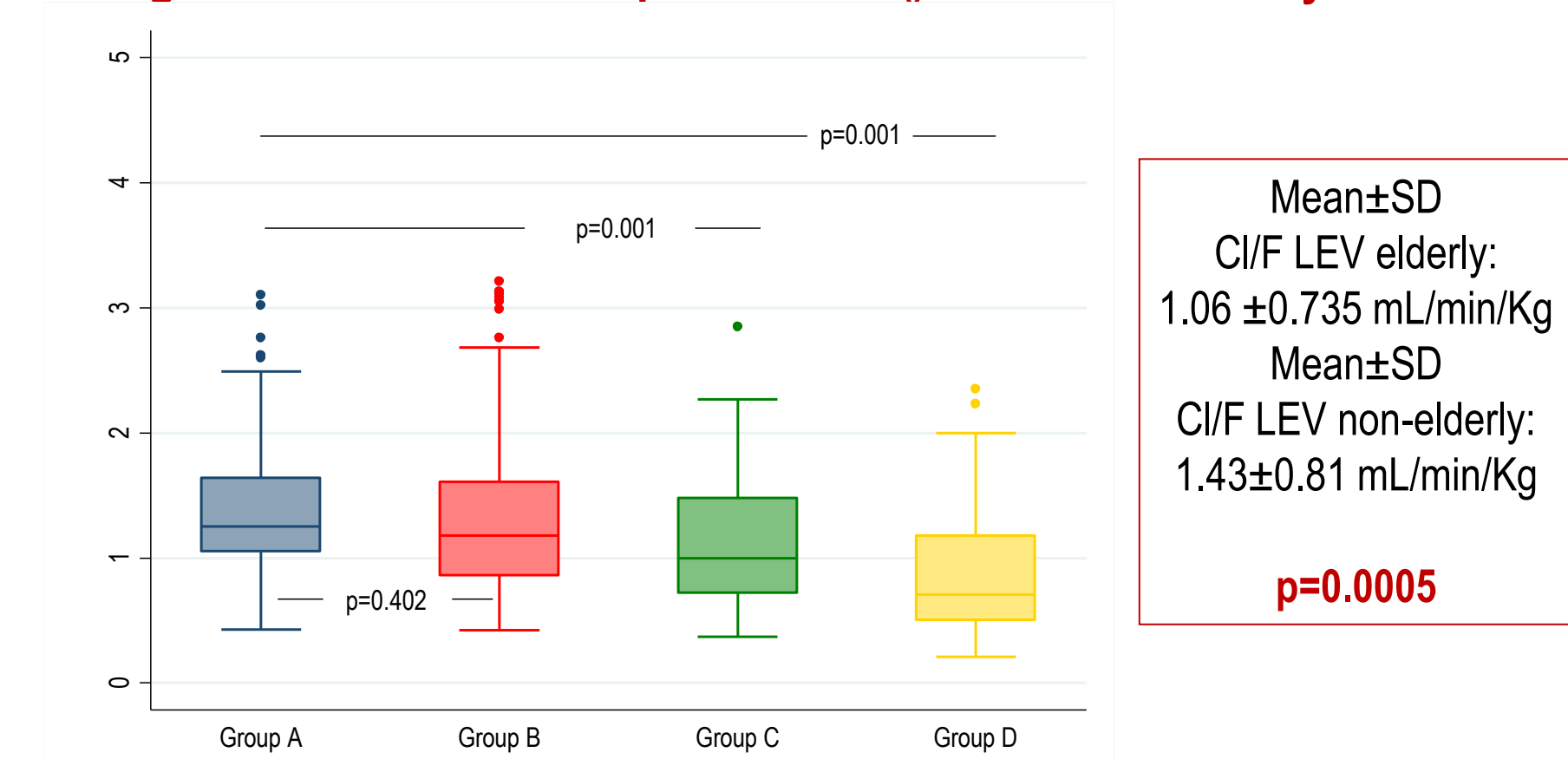
\*\* Statistically significant differences between D and A; B, C.



**Figure 2: Serum concentrations of LEV related to age**



**Figure 1: The relationship between  $C_0$  LEV and dose/day**



**Figure 3: Apparent clearance of LEV related to age**

## CONCLUSIONS

- Mean  $C_0$  LEV in elderly was statistically higher than non-elderly, despite of the mean dose/day was 21% lower.
- To achieve a given serum drug concentration, LEV dose should be reduced by around 30% in elderly patients compared to younger subjects.
- LEV CL/F significantly declines with aging, with a reduction of median values ranging from 20% in patients aged 50-65 years to 35% in those over 65 years compared with non-elderly patients.