Correlates of one-year mortality among patients living with HIV according to the stratification level of the pharmaceutical care model.

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BACKGROUND & IMPORTANCE

- The **success of highly active antiretroviral (ARV) therapy** has allowed people living with HIV (PLWH) to have a **near-normal life expectancy**.

- The increase in life expectancy has generated a **new set of challenges** in these patients, who often experience **age-related comorbidities** and, with it, **polypharmacy** with the negative consequences.
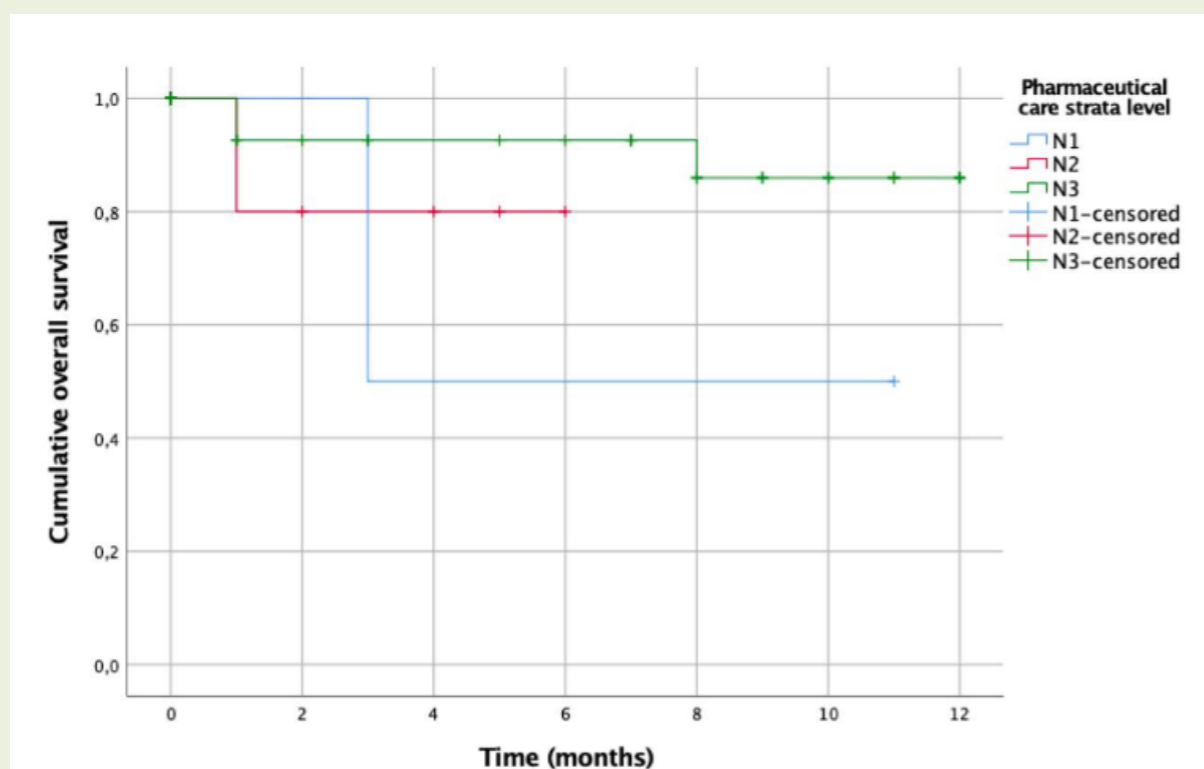
AIM & OBJECTIVES

- To analyze the **effect that the level of stratification has on mortality** results at one year and develop a predictive model in PLWH on active ARV.

RESULTS

- A **total of 427 PLWH** were included; 352 (82.2%) Males. **Three PLWH were lost to follow-up**, 2 of them due to a change in hospital center and 1 due to abandonment of follow-up by both the doctor and the pharmacist.

- The **distribution of patients according stratification model** was: level 3 (83%), followed by 12% and 5% for level 2 and 1, respectively.

- The **clinical variables determined prior to the death** of the patients show that more than half had undetectable viral load (80%) and CD4+ >200 cell/mm3 count (60%).

- The **overall mortality rate from any cause in our population was 11.7 per 1000 PLWH**. Causes of death in PLWH were cardiovascular disease (n=2), cancer (n=1), pneumonia (n=1) and acute respiratory failure (n=1). Survival function shown in figure 1.

- If we focus on **clinical variables**, the Long-Rank test found significant differences in those patients who suffered from **type 2 diabetes mellitus** (p=0.04) and **arterial hypertension** (p=0.04) compared to those without a diagnosis of these diseases.

- When using the Long-Rank test to compare the **level of stratification**, we found significant differences in the proportion of deaths **(p=0.02).**

- In a multivariable Cox proportional hazard model that included **the stratification level was associated with a higher mortality** whose **level 1 patients had a 99.7% higher mortality** (HR: 0.0003; 95%CI: 0.001-0.027; p<0.01) and **level 2 patients had a 22% higher mortality** (HR: 0.078; 95%CI: 0.01-0.58; p=0.02) than patients classified in level 3. **The AUC-ROC was 0.98** (95%CI: 0.96-1.00). ROC curve shown in figure 2.

METHODS

- A single-center, cross-sectional study that included **PLWH on active ARV** who attended Pharmaceutical Care outpatient between January 1 and March 31, 2021 and were **followed up for a period of 1 year.**

- Demographic, clinical, pharmacotherapeutic variables pharmaceutical care, level of stratification (**according to HIV patient model published by SEFH[1]**) were collected (*Table 1*)

- A **survival analysis** was performed to assess how **the level of stratification predicted mortality at one year**. The survival rate was estimated using Kaplan-Meier and differences between levels were evaluated using Log-Rank test.

- **A Cox regression** was run to estimate hazard ratios. To evaluate the discriminatory power of the model, the calculation of the area under the ROC curve (AUC-ROC) was carried out .

Table 1. **Baseline characteristics**

Characteristics	Entire Cohort (n=427)	N1 (n=17)	N2 (n =43)	N3 (n = 367)	P Value[a,b]
Median age, y (IQR)	51 (42-57)	51 (47-58)	55 (52-58)	51 (51-53)	0.24[c]
Male sex	352 (82.2)	12 (70.6)	33 (76.7)	306 (83.4)	0.09
Comorbidities					**0.01**
Depression	37 (8.7)	1 (5.9)	4 (9.3)	32 (8.7)	0.91
Dyslipidemia	79 (18.5)	4 (23.5)	8 (18.6)	67 (18.3)	0.86
Diabetes mellitus type 2	33 (7.7)	0 (0)	7 (16.3)	26 (7.1)	0.04
High blood pressure	86 (20.1)	7 (41.2)	11 (25.6)	68 (18.5)	**0.04**
Polypharmacy	111 (25.9)	2 (11.8)	16 (37.2)	38 (10.4)	0.91
ARV type					0.14
NRTI + NNRTI	43 (10.0)	1 (5.9)	4 (9.3)	38 (10.3)	
NRTI + PI	60 (14.0)	2 (11.8)	5 (11.6)	53 (14.4)	
NRTI + INI	212 (49.4)	8 (47.1)	18 (41.9)	185 (50.3)	
Others	114 (26.6)	6 (35.3)	16 (37.2)	92 (25.0)	

[a]P value compares patients stratified according model risk-stratification of patients for pharmaceutical care in patients with HIV of the Spanish Society of Hospital Pharmacy.
[b]X2 test unless otherwise specified.
[c]T-test used to calculate P value.

Figure 1. **Overall survival curve based on the level of stratification.**

Figure 2. **ROC curve for predictive mortality regression model**
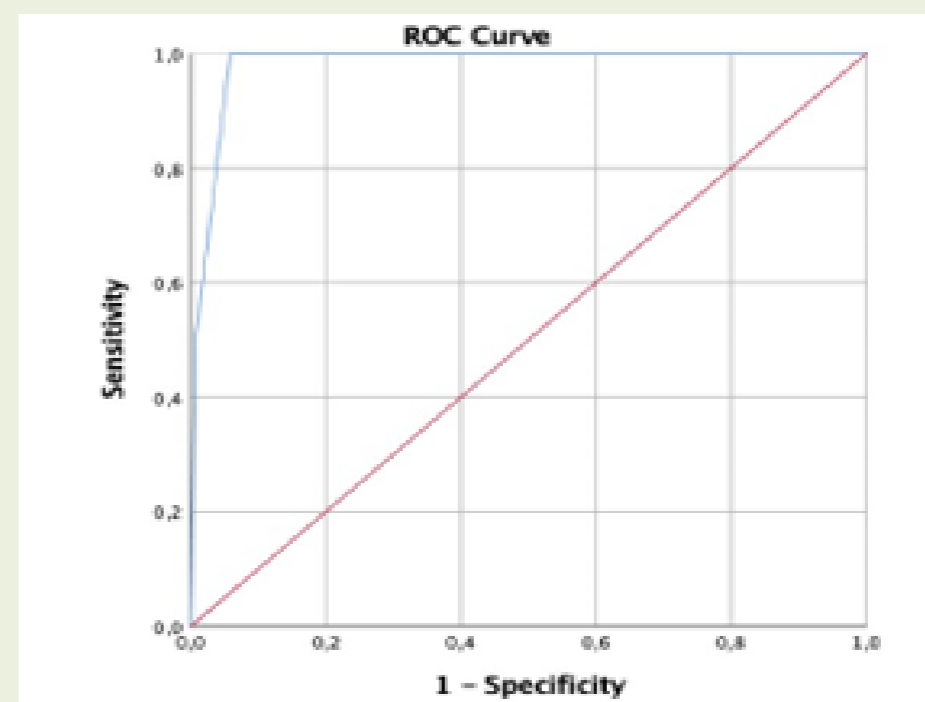
AUC	SE	Signif	95%CI lower limit	95%CI Upper limit
0.982	0.011	0.001	0.961	1.000

CONCLUSION & RELEVANCE

➢ Our study showed that In this cohort of PLWH outpatients, **overall mortality of one year differs when comparing the pharmaceutical care stratatification**, despite being similar in age and other clinical conditions.

➢ This suggests that **the multidimensional stratification tool**, included in the CMO pharmaceutical care model, could be used to modulate the intensity of patient follow-up and design interventions more tailored to their needs, in order **to improve their health status and quality of life.**

Consulta de Atención Farmacéutica Patologías Víricas

1. Morillo-Verdugo R, Martínez-Sesmero JM, Lázaro-López A, Sánchez-Rubio J, Navarro-Aznárez H, De Miguel-Cascón M. Development of a risk stratification model for pharmaceutical care in HIV patients. Farm Hosp. 2017; 41(3):346-356. doi: 10.7399/ fh.2017.41.3.10655