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Introduction:

Patients with severe COVID-19 admitted to ICU have an increased risk of bacterial and fungal superinfections [1;2]. Steroid therapy with dexamethasone is one of the recommended treatments for patients on oxygen therapy. The aim of this study is to evaluate the incidence of superinfections in patients treated with steroids.

Methods:

We performed an observational retrospective study, including patients with severe COVID-19 admitted to our ICU between March 2020 and February 2021. Data on bacterial and fungal superinfections and steroid therapy were collected.

Results:

Among the 152 patients enrolled, 82 (53.9%) received steroid therapy before admission to ICU, 50 (32.9%) did not receive steroids, for 20 (13.2%) the steroid treatment was not known. The clinical characteristics of the two groups of patients at admission are presented in *Table 1*. Comparing patients receiving steroids and those not receiving steroids, the incidence of superinfections due to fungi was respectively 29.6% vs 12.2% (RR 2.41, CI 95%: 1.06-5.50). The incidence of Gram- and Gram+ superinfections was respectively 56% vs 55% (RR 1.03, CI 95%: 0.75-1.41) and 54% vs 38% (RR 1.40, CI 95% 0.93-2.09). Among Gram- superinfections, we observed a significant association between steroid therapy and *Acinetobacter spp.* superinfection (19.7% in patients on steroids and 6.1% in patients who did not receive steroids, $p = 0.03$). The duration of steroid therapy was directly correlated with the number of superinfections for each patient (Spearman's $\rho = 0.34$, CI 95% 0.18-0.48, $p < 0.001$).

Conclusion:

In patients with severe COVID-19 admitted to ICU, steroid therapy seems to be a risk factor for fungal superinfections and associated with *Acinetobacter spp.* superinfections. The duration of the steroid therapy is directly correlated to the number of superinfections for each patient.

References:

- [1] Langford BJ et al. *Clinical Microbiology and Infection* 26:1622-1629, 2020
[2] Falcone M et al. *Journal of Antimicrobial Chemotherapy* 76(4):1078-1084 2021

Table:

Clinical features	Patients receiving steroids (n = 82)	Patients not receiving steroids (n = 50)	p-value (unpaired t-test or Mann-Whitney U test)
Age, years	67 [59-74]	60.5 [50-68]	< 0.01 *
SOFA score	7.14 ± 1.98	7.94 ± 1.69	0.02 *
PaO ₂ /FiO ₂	107 [75-164]	118 [84.5-193.5]	0.34
Leukocytes, x 10 ³ /mm ³	10.81 [7.93-15.25]	10.00 [6.94-13.08]	0.11
Lymphocytes, x 10 ³ /mm ³	0.50 [0.35-0.76]	0.54 [0.36-0.87]	0.31

10³/mm³

Procalcitonin, ng/ml 0.27 [0.11-0.7] 0.55 [0.19-1.59] 0.02 *

Clinical characteristics of the two groups of patients at admission.