IMPACT OF AUGMENTED RENAL CLEARANCE ON ANTIMICROBIAL DOSING IN SEVERELY BURNED PATIENTS

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BACKGROUND AND IMPORTANCE

Augmented renal clearance (ARC) is a phenomenon observed in critically ill patients which can potentially lead to subtherapeutic drug concentrations and treatment failure.

AIM AND OBJECTIVE

- Describe the prevalence of ARC in a cohort of severely burned patients.
- Describe antibiotics used potentially being underdosed.

MATERIALS AND METHODS

- Retrospective observational study including critically burned patients admitted to our burn unit between January 2020 and November 2021.
- Patients were considered to have ARC if they presented creatinine clearance (CrCl) of ≥130 mL/min.
- CrCl was calculated through the Cockroft-Gault equation using samples taken during the stay.
- A search for hydrophilic antibiotics employed during lenght of stay was performed.

RESULTS

- 48 critically burned patients were included in the study. A summary of their characteristics can be seen in Table 1.
- **Median serum creatinine was 0,65** (0,3-2,1) mg/dL and **median ClCr was 152** (44,8-256,3) mL/min. Distribution of patients according to renal function is showed in Figure 1.
- Most patients with ARC were being treated with antibiotics at some point. Percentage of patients with ARC being treated with different antiobiotics is showed in Table 2.

Table 1. Description of patients included in the study

Age	45 (16-85)
Gender (females)	17 (35,5%)
Three degree burns	40 (87,5%)
Burned body surface area	22% (5-85)
Admission due to flames	45 (93,4%)
Smoke inhalation	26 (54,1%)
Days of stay	32 (2-208)
Abbreviated Burn Severity Index (ABSI)	8 (3-13)
Mortality	14,7%

*Continuous variables expressed as medians (range) and categorical variables as cases (percentage).

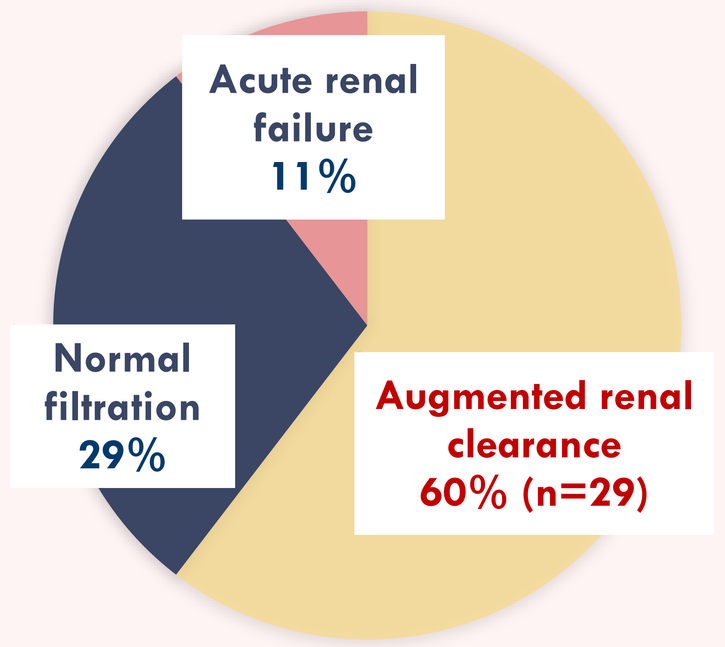

Figure 1. Renal function

Table 2. Use of antibiotics in ARC patients (%)

Beta-lactams	82,8
Aminoglycosides	29,2
Daptomycin	20,8
Teicoplanin	20,8
Linezolid	16,7

CONCLUSION AND RELEVANCE

- Our findings provide further evidence that **severely burned patiens frequently exhibit ARC.**
- Almost **two-thirds** of our patiens presented ARC and most of them **were being treated with antibiotics that could potentially be underdosed.**
- Pharmacists can play a significant role in **identifying these patients** and **optimising the dosage** taking this phenomenon into account.