ADJUSTMENT OF ANTIBIOTICS THROUGH THE HEMOFILTER: A CASE REPORT

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AIM AND OBJECTIVES

In renal support therapies, the amount of drug eliminated will depend on the therapeutic modality used (convection/diffusion) and dosage, the fluid replacement site (prefilter/postfilter), as well as the filter surface and material, but also on intrinsic characteristics of the drug itself: volume of distribution (DV), plasma protein binding (PPB), molecular weight (MW) and patient characteristics.

MATERIAL AND METHODS

- Our case is a **67-year-old woman** admitted to the ICU for septic **shock of probable urinary origin.**
- Given the urea levels, metabolic acidosis with severe electrolyte disturbance and acute on chronic renal failure, extrarenal depuration therapy was started with **continuous venovenous hemodiafiltration (CVVHDF)** and **empirical antibiotic treatment** with **ertapenem 1g/24h.**

- Literature review was made to evaluate the adjustment of antibiotic therapy in hemofiltration until antibiogram results were obtained. **The most dialyzable drugs are those with low MW, low DV, high renal clearance and low PPB.**

RESULTS

Among the carbapenems, the most studied is meropenem. It presents low UPP (2%), PM 383.4 Dalton and a VD between 11-27L, resulting in a better alternative to ertapenem.

→Antibiotherapy was modified to meropenem adjusted to CVVHDF 1g/6h in 3h extended perfusion prior loading dose of 2 g to ensure an MIC >40% of the time to achieve both bacteriostatic and bactericidal effect.

After antibiogram, it was downgraded to ceftriaxone, a hydrophilic molecule, with high UPP (85-95%) and a PM 554.58 Dalton. Hydrophilic drugs such as cephalosporins and penicillins generally do not cross cell membranes, so they only diffuse to the extracellular space and their DV is lower than that of lipophilic drugs, in addition to renal elimination. **Ceftriaxone, however, despite being a hydrophilic drug, is preferentially eliminated through bile and, since it has such a high affinity to protein, it is hardly dialyzed and therefore does not require adjustment. To ensure correct antibiotic dosage, it was decided to use ceftriaxone 1g/12h prior loading dose of 3g for reaching levels early.**

CONCLUSION

The prescription of the appropriate dose of antibiotic is fundamental in the critical patient since it allows avoiding the establishment of excessive doses that can cause toxicity or an insufficient dose causing therapeutic failure or favoring the appearance of multi-resistances.

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