

Aminoglycoside Kinetic Profiles Comparison During Direct Hemoperfusion by Extracorporeal Adsorption Unit (Lixelle S-35 Cartridge).

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Background. The bactericidal activity against Gram(-) microorganisms of Tobramycin (TOB) and Gentamicin (GEN) is concentration-dependent. It is therefore fundamental to achieve the maximum drug plasma levels. Lixelle S-35 cartridge is a sorbent medical device used in Dialysis-Related-Amyloidosis (DRA) which can modified the drug plasma levels due the adsorption phenomenon. The aim of the present *in vitro* study was to evaluate the TOB and GEN adsorption removal by Lixelle S-35 cartridge.

Materials and Methods. We performed a mock direct hemoperfusion (DHP; Blood flow: 100 ml/min) for 120 min using Lixelle S-35 cartridge with a prototype of dialysis machine (Bellco, R&D Electronic Division, Mirandola, Italy). Human blood obtained from healthy volunteers was diluted with fresh frozen plasma, equally obtained, in order to achieve appropriate rheological characteristics (Hct 30%; 650 mL each bag; n=6). Blood was separately spiked with TOB (11.00±0.42 mg/L; n=3) and GEN (12.80±1.06 mg/L; n=3) then it was circulated into the *in vitro* system. Samples were taken from arterial (Cpin) and venous (Cpout) lines at 5, 10, 60 and 120 min. Sample levels were measured by TOBR[®] and GENT[®] Flex methods (Siemens Healthcare, Newark, NJ. USA) for TOB and GEN, respectively. The adsorption kinetics profiles were calculated.

Results. At the of DHP TOB and GEN levels were 7.13±0.18 mg/L and 7.20±0.90 mg/L. Ratio Cpout/Cpin rose rapidly during the first 5 min then reach plateau for both antibiotics as shown Figure below. On mass balance analysis, the total mass of antibiotics introduced into the *in vitro* system decreased from 5.12±0.25 mg to 3.22±0.50 mg and from 6.16±0.51 mg to 3.32±0.41 mg for TOB and GEN, respectively. The TOB mass adsorption was 37.20% whereas GEN was 46.20%.

Conclusions. Our *in vitro* study indicates an high adsorption rate for both aminoglycosides. This should be considered when TOB or GEN are used in patients treated with Lixelle S-35 cartridge during extracorporeal therapy. A supplemental dose may be needed to maximized their efficacy.