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P0834 Rapid development of rifampicin resistance, why soaking vascular grafts should stop!

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Background: Vascular graft infections are associated with high rates of mortality and amputation. To prevent Surgical Site Infections a widely-spread approach is to dip stent grafts in rifampicin before implantation. However, this approach could lead to the emergence of multi-drug resistant bacteria. The aim of this study were to compare the antimicrobial efficacy of commercialized readymade impregnated grafts with rifampicin soaked ones, in addition to screening for rifampicin resistance development.

Materials/methods: Four commercialized grafts (INTEGARD, INTEGARD Silver, INTEGARD SYNERGY (silver and triclosan) and INTEGARD grafts soaked in rifampicin were used in this study. The microorganisms panel includes: *Escherichia coli ATCC, E. coli* ESBL+, *Staphylococcus aureus* (MRSA) ATCC, *S. aureus* (MRSA) rifampicin resistant strain , *Staphylococcus epidermidis* ATCC, *Candida albicans* ATCC and *C. albicans* clinical strain. The grafts were cut by a surgical puncher. The Intergard grafts were impregnated in Rifampicin (5ml/ml) during 10min and then dried out. The strains cultures were calibrated at 10^5 CFU/ml. Each graft was then over-layed by 500 µl of one microorganism culture in a 1.5ml Eppendorf tube. Time kill assays were carried out over a 7-day period. Time slots for colony counting and molecular analysis of the isolates were set at 24H, 48H, 72H and 7 days. An additional 500 of fresh broth was added to all tubes after 72H incubation. All tests were realized 06 times.

Results: Rifampicin, although bactericidal against staphylococci, lost its efficacy over time. As expected it was less efficient against *E. coli* isolates and demonstrated no activity when using *the S. aureus (*MRSA) rifampicin resistant strain or *C. albicans*. In parallel, we observed a persistent bactericidal activity of the INTERGARD SYNGERY over time for all tested microorganisms. More importantly, laboratory generated rifampicin resistant mutant strains of *S. aureus* and *S. epidermidis* were observed at 7 days. In addition, when simulating a re-infection, rifampicin was not active against the resistant mutants.

Conclusions: Physicians should stop soaking grafts in rifampicin and steer away from all conventional antibiotics used for therapy to avoid compromising their clinical use. Ready-made commercialized impregnated grafts should be considered as a useful mean to supplement infection prevention programs.