

Local application of CarboCell G/C eradicates *Staphylococcus aureus* in an experimental orthopaedic prophylactic setting

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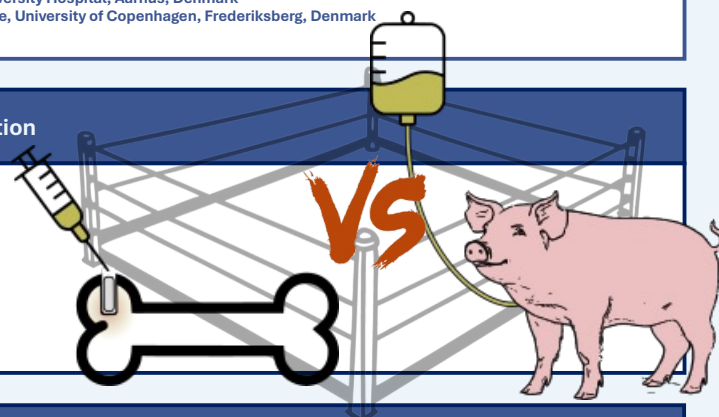
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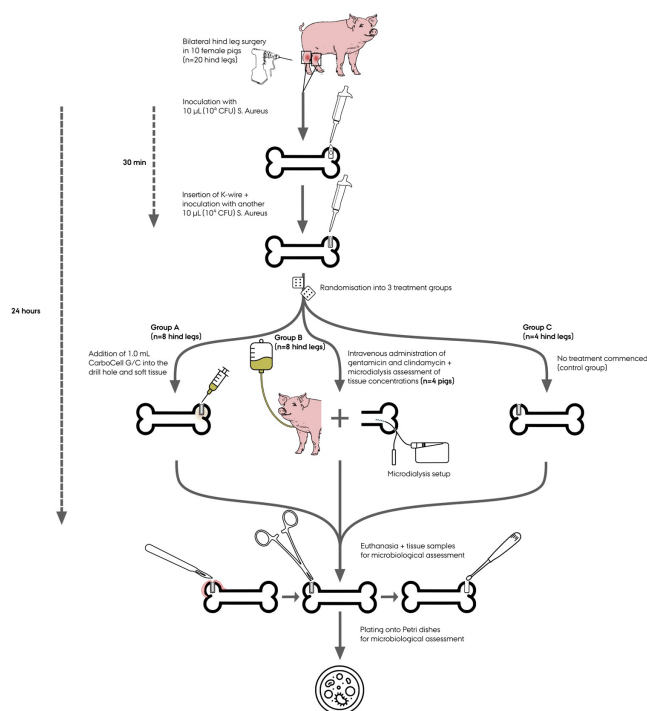
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Introduction

All surgical procedures inherently carry a risk of postoperative infection, which can be particularly complex in orthopaedic surgery due to the frequent use of implants and foreign bodies. In recent years, an emphasis has been put on local antibiotic prophylaxis. We investigate the prophylactic properties of CarboCell G/C – a novel injectable containing gentamicin and clindamycin – compared to systemic prophylaxis with gentamicin and clindamycin.



Study overview



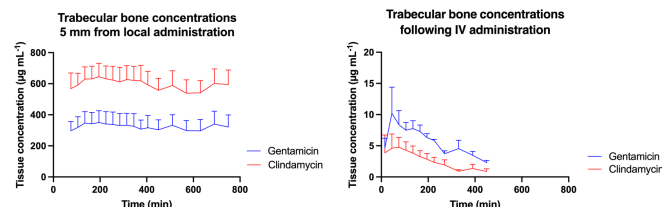
Results

In Group A, no *S. aureus* growth was identified on any samples. In Group B, one K-wire yielded *S. aureus* growth. In Group C, *S. aureus* growth was identified in all but one tissue sample. Compared to locally administered CarboCell G/C, systemically administered gentamicin and clindamycin exhibited peak drug concentrations in bone tissues that were 44 and 140 times lower, respectively.

Group (treatment)	Compartment	Bacterial growth (n/N)	Mean bacterial count*
A (CarboCell G/C)	Bone tissue	0/8	N/A
	Soft tissue	0/8	N/A
	K-wire	0/8	N/A
B (IV gentamicin + clindamycin)	Bone tissue	0/8	N/A
	Soft tissue	0/8	N/A
	K-wire	1/7	0.11 log(CFU/mm ² + 1)
C (No treatment)	Bone tissue	4/4	4.42 log(CFU/g + 1)
	Soft tissue	3/4	3.47 log(CFU/g + 1)
	K-wire	4/4	3.15 log(CFU/mm ² + 1)

*Only material positive for *S. aureus*

Microbiological findings in the three groups (A, B and C).



Mean bone concentrations of gentamicin and clindamycin following local administration (left) and systemic administration (right). Concentration data for local administration source: Mikkelsen MKD, Jørgensen AR, Korta NG, Stilling M, Damsgaard PB, Crocoll C, et al. CarboCell G/C offers high and prolonged concentrations of gentamicin and clindamycin in bone tissue following intraosseous injection. J Bone Joint Infect. 2025;10(4):327-34. doi:10.5194/jbji-10-327-2025.

Conclusions

Both CarboCell G/C and systemic administration of gentamicin and clindamycin effectively prevented infection establishment and protected the implant within an experimental surgical orthopaedic setting. Further, CarboCell G/C enables markedly higher targeted bone concentrations of gentamicin and clindamycin. These findings suggest that the CarboCell G/C technology may represent a viable alternative to systemic antibiotic administration for local infection prevention, with the potential to reduce off-target selection pressure and support antimicrobial stewardship.

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