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Antibiotic loaded calcium sulphate for the treatment of osteomyelitis and chronic soft tissue infections: Are regular serum assays required?

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Introduction: The management of osteomyelitis and deep soft tissue infections remains a significant challenge for orthopaedic surgeons. A relatively new and effective treatment options for these conditions is antibiotic loaded biodegradable calcium sulphate. One of the main advantages of this treatment method is its ability to deliver significantly high doses of antibiotics locally, therefore allowing for elimination of the infection. However, this also raises concerns about the systemic levels of these antibiotics which in theory can lead to significant complications in patients.

Methods: We analysed the serum levels of gentamicin and vancomycin in 22 patients who had gentamicin and vancomycin loaded calcium sulphate beads inserted following surgical debridement for the treatment of osteomyelitis or soft tissue infection. Antibiotic levels were then checked between days 0-3 following the procedure and the patients' renal function before and after the procedure were also noted.

Results: Patients with normal renal function were occasionally found to have high levels of gentamicin in the very early post-operative period but these levels decreased significantly within a short period of time. However, patients with significant renal dysfunction were noted to have high levels of gentamicin which persisted for a longer period.

Conclusion: The results of the study suggest that regular monitoring of serum levels of gentamicin and vancomycin in patients with normal renal function treated with antibiotic loaded calcium sulphate may not be required. However, in patients with renal dysfunction, antibiotic levels should be closely monitored, and the doses used may need to be significantly reduced to avoid complications associated with high systemic levels of gentamicin and vancomycin. Post-operative dialysis and removal of these beads may also be considered if high levels of gentamicin and vancomycin persists.

Biography

Louai Abdeh is Trauma & Orthopedics Core Surgical Trainee at the Manchester Royal Infirmary. As a medical student and junior doctor, he have taken an active role in many clinical governance and research projects, and he have presented at a number of conferences including the ASiT International Conference 2018, Barts and London National Undergraduate Surgical Conference and Warwick Undergraduate Regional Medical Conference. He have also completed a Master of Research in Tissue Engineering for Regenerative Medicine, and he received a distinction grade for my dissertation "The Role of Macrophages and Mast Cells in Fibroblast to Myofibroblast Differentiation- An insight into the Relationship between Inflammatory Cells and Fibrosis".

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