SHOULD SYSTEMIC ABSORPTION BE A CONCERN WHEN USING ANTIBIOTIC-LOADED CALCIUM SULPHATE IN THE TREATMENT OF OSTEOMYELITIS OR SOFT-TISSUE INFECTION?

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Published Online:5 Apr 2018

Aim

To determine if systemic toxicity occurs after the use of antibiotic loaded calcium sulphate in the treatment (1) of bone and soft tissue infection.

Although antibiotic loaded calcium sulphate is increasingly used for the local treatment of bone and soft tissue infection, there is little data to demonstrate that systemic levels generated by local release of antibiotics are safe. For this reason, we routinely assay systemic levels of antibiotics.

Methods

Patients with osteomyelitis or soft tissue infection underwent surgical debridement and lavage of the infected tissue in routine fashion. Patients with osteomyelitis were graded with the Cierny-Mader classification. Bone cavities and soft tissue dead spaces were packed with antibiotic loaded calcium sulphate (10–40 cc) loaded with Vancomycin (1–4 g) and Gentamicin (240–960 mg). The wounds were closed over the antibiotic loaded calcium sulphate.

Patients underwent serial assays of Vancomycin and Gentamicin levels on the day of surgery and the first two post-operative days. Renal function was also measured.

Results

12 limbs in 10 patients were treated for osteomyelitis or soft tissue infection. There was 1 Cierny-Mader grade 1, 3 Cierny-Mader grade 3, and 2 Cierny-Mader grade 4. Two had deep soft tissue infection alone. There were 3 type A hosts and 7 type B hosts. The patients age ranged from 24 to 89 (mean 54).

In patients without renal dysfunction, the systemic levels were either unmeasurable at the first assay, or below the acceptable trough level. (Mean 2.4 and 1.8 for Vancomycin and Gentamycin respectively). They had unmeasurable systemic levels at the third assay.

In patients with renal dysfunction, systemic levels were in the therapeutic range determined for systemically administered antibiotics, but these levels remained high and did not decrease until patients had undergone their routine dialysis.

Conclusions

In patients treated with antibiotic loaded Stimulan, antibiotic assays are not necessary in patients who have normal renal function, as they clear the systemic absorption as quickly as it is generated. Patients with impaired renal function should have lower doses of antibiotic used for their topically applied carrier, and should undergo assays regularly to ascertain if levels are remaining below the

accepted range determined for systemically administered antibiotics. If they remain high, the antibiotic loaded calcium sulphate could be removed.

* Stimulan (Biocomposites, Keele, UK)