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Management of diabetic foot infections in a tertiary hospital in UK: Microbiological testing strongly influences the antibiotic treatment

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Aim: To characterise the results of microbiological testing and examine its influence on the antibiotic (AB) choice in diabetic foot disease.

Methods: Retrospective analysis of all diabetic patients who had deep tissue samples from the foot between January 2012 and December 2013. Using the Infectious Diseases Society of America (IDSA) and International Working Group on the Diabetic Foot (PEDIS) classifications, each patient's presenting condition was graded 1 (no infection) to 4 (severe infection) with osteomyelitis (OM) as a discrete diagnostic entity. Information was collected on gram stain, culture result and AB therapy.

Results: 118 samples from 74 patients (mean age 63 years (range 27-88 years)) were examined. Gram stain showed poor correlation with the final culture, with an overall sensitivity of 76% and specificity 73%. Sensitivity was especially low in detecting the presence of gram negative rods (24%) and specificity was poorest when gram positive cocci were seen (35%). Up to five organisms per sample were isolated in culture. Excluding anaerobic growth, gram positive organisms were isolated in 54% of samples and gram negatives in 41%. There was no significant difference between organisms grown and grade of infection. At the time the sample was taken, only 34% of patients were on an appropriate empirical AB regimen. After the final culture report was received, 70% of patients had a change of AB regimen and 86% of patients were on an appropriate AB regimen.

Conclusions: Gram stain is poorly representative of the tissue culture result in this cohort. Considerable adjustment of AB regimens was made in response to the final microbiology culture and sensitivity report. Despite improved guidance both internationally and locally, many diabetic patients are still started on inappropriate empirical ABs for their foot infection by non-specialist clinicians. In many cases, this is represented by the use of a narrow-spectrum agent (e.g. flucloxacillin) for grade 4 infections or OM. This may be due to clinicians erroneously considering the treatment of a diabetic foot infection to be the same as that for cellulitis in a non-diabetic patient, misclassification of severity, unfamiliarity with the PEDIS classification and/or non-adherence to local AB guidelines.