DIABETIC FOOT OSTEOMYELITIS TREATMENT: A Service Review of Success Rates Involving Patients Requiring Intravenous Antibiotics for Resolution of their Osteomyelitis & Wound Healing

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Introduction

This service review was performed by the Specialist Multidisciplinary Foot-care Service (MDFS) at NUH NHS Trust. It encompasses activity in 2015 and 2016 in which 1250 total new referrals were seen with 10,860 follow up appointments. 266 people were treated for osteomyelitis (OM) of the diabetic foot with 6-10 weeks oral antibiotics. 164 (61.7%) clinically resolved without further therapy. This service review looked at patients treated with IV antibiotics over the 2 year period to better inform patient consultations. We concentrated on the population who were most difficult to treat either because they failed oral antibiotics, presented septic to hospital or lacked oral antibiotic choices due to patient allergies or resistant bacteria cultured from deep tissue sampling.

THE OUTCOME MEASURES RECORDED WERE:

- Clinical resolution of OM at 12 months
- Wound healing at 12 months

4 FACTORS WERE SPECIFICALLY STUDIED:

- Location of OM
- Presence/absence of peripheral arterial disease
- Failure of prior oral antibiotics
- Number and type of organisms cultured

Methods

STUDY POPULATION IDENTIFIED RETROSPECTIVELY FROM:

- Specialist ward admission list
- Outpatient Parenteral Antimicrobial Therapy (OPAT) records

EXCLUSIONS:

- IV treatment for related OM outside the study period
- Soft tissue infection with no recorded evidence of OM

Hospital records (notes, letters, photos and radiological investigations) used to assess the outcome measures at 1 year

Results

145 people completed IV treatment for OM of which 139 included in study – 6 were lost to follow up

Demographics : Mean age 64 (30-92), Mean HbA1c 77mmol/mol (43-122), Male 74%, Type 2 DM 84%, Duration of DM over 10 years 84%

Treatment: Antibiotic choice guided by consultant microbiologist, all were treated with 6-12 weeks of IV antibiotics and all had continual care from the MDFS

Variable	Total n	Therapeutic success[a] at 12 months n (%)	Surviving patients wound healed at 12 months n (%)
Digit OM	16	15 (93.8)	11 (78.6)
Forefoot OM	78	50 (64.1)	45 (66.2)
Midfoot OM	20	9 (45.0)	8 (42.1)
Hindfoot OM	25	14 (56.0)	6 (35.3)
PAD present	75	44 (58.7)	31 (47.0)
PAD not present	64	44 (68.8)	39 (75.0)
Prior oral treatment for osteomyelitis[b]	40	19 (47.5)	22 (61.1)
Prior oral treatment for soft tissue infection	41	26 (63.4)	16 (48.5)
No prior antibiotic treatment	58	43 (74.1)	32 (65.3)
Single organism isolated	43	27 (62.8)	21 (53.8)
Multiple organisms isolated	87	56 (64.4)	44 (62.9)
No growth	3	0 (0)	0 (0)
No sampling	6	5 (83.3)	5 (83.3)
Gram-positive growth only	61	46 (75.4)	35 (66)
Gram-negative growth only	18	7 (38.9)	7 (41.2)
Mixed Gram growth	41	25 (61.0)	17 (36.7)
Anaerobes grown	10	5 (50.0)	6 (66.7)
Total	139	88 (63.3)	70 (64.8)

[a] Therapeutic success defined as osteomyelitis considered resolved with no further surgery or IV antibiotics.
[b] Defined as use of oral antibiotics for this episode of osteomyelitis, within 12 weeks prior to admission for IV antibiotics.

Table: Clinical outcomes observed with 4 variables explored: Location of OM, Presence/ absence of PAD, Failure of prior oral antibiotics, Number and type of organisms cultured

Score	OM Resolution
0 (n = 4)	100.0%
1 (n=13)	92.3%
2 (n = 37)	73.0%
3 (n= 31)	58.0%
4 (n= 23)	39.1%
5 (n=13)	46.2%

Osteomyelitis Resolution in differing circumstances

Each person in study population given a 'score' based on four factors we examined to help us understand the cumulative effect of adverse factors:

Location: Digit = 0, Forefoot = 1, Mid/hindfoot = 2
PAD status: No PAD = 0, PAD = 1
Previous prolonged oral antibiotic treatment: No= 0, Yes = 1
Organisms cultured from samples: Gram +ve only = 0, Mixed = 1, Gram –ve only = 2

Discussion

The success rates of treatment for diabetic foot OM varied substantially depending on the situation. It was expected that patients with hindfoot OM, PAD or prior po antibiotics would have worse outcomes. However, the presence of Gram-negative bacteria from deep samples also appears to be an indicator of a reduced chance of successful treatment. The combination of information from this service review will be used in clinical consultations to give patients more specific advice on their prognosis based on their individual circumstances.