Indicators of prognosis for admissions from a specialist diabetic foot clinic

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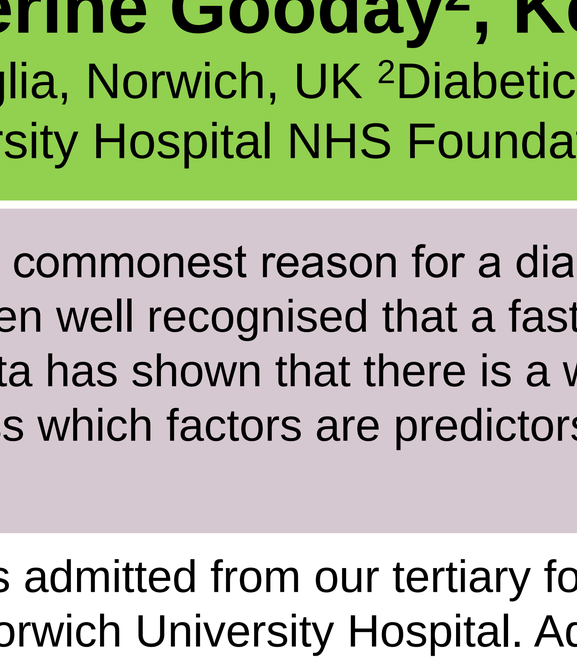
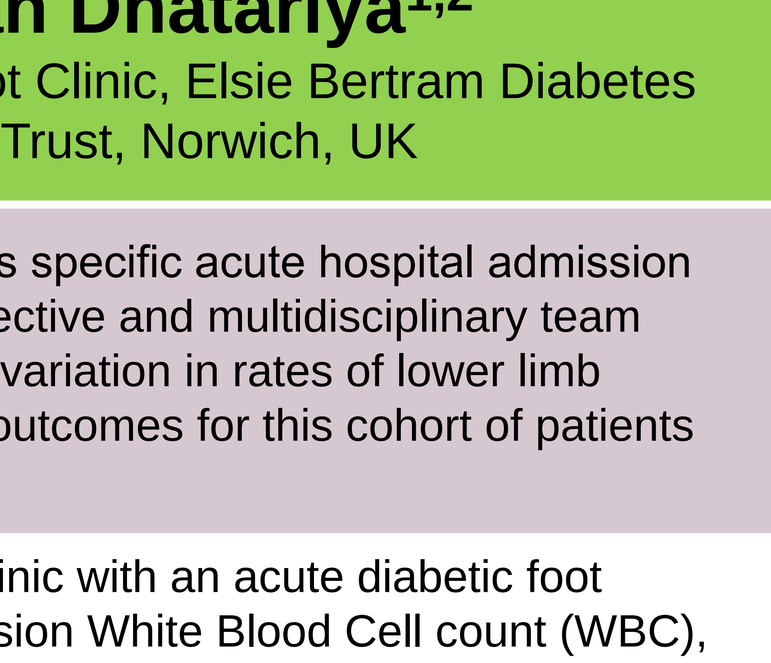
Background and Aim: The 'diabetic foot' remains the commonest reason for a diabetes specific acute hospital admission in the UK[1] with most cases being infections[2]. It has been well recognised that a fast, effective and multidisciplinary team approach improves outcomes[3]. Despite this, recent data has shown that there is a wide variation in rates of lower limb amputation across the UK[4]. This study aimed to assess which factors are predictors of outcomes for this cohort of patients at high risk of morbidity and mortality.

Methods: This was a retrospective analysis of patients admitted from our tertiary foot clinic with an acute diabetic foot complication between 2008-2012 at the Norfolk and Norwich University Hospital. Admission White Blood Cell count (WBC), neutrophils and C-Reactive Protein (CRP) were recorded, with the most recent glycated haemoglobin (HbA1c). In addition to location and depth of ulcer on admission, and prior antibiotic use. The Charlson Index score was also calculated[5]. Outcomes analysed were angioplasty, minor/major amputation and mortality at <30 days and at 1 year.

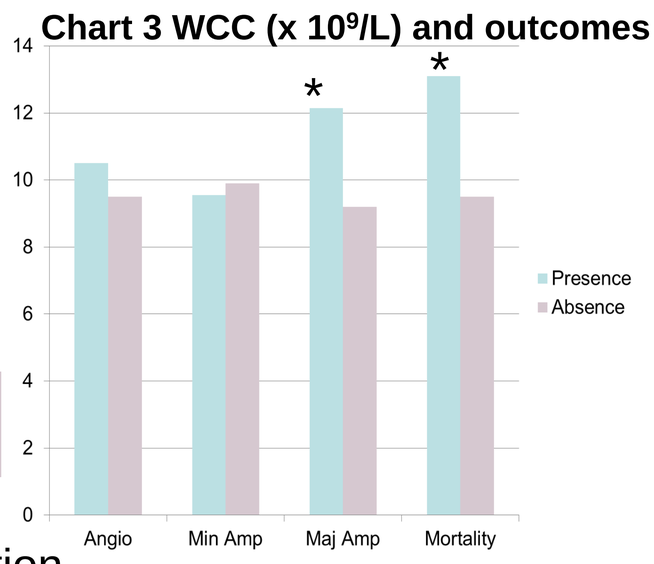
Results:

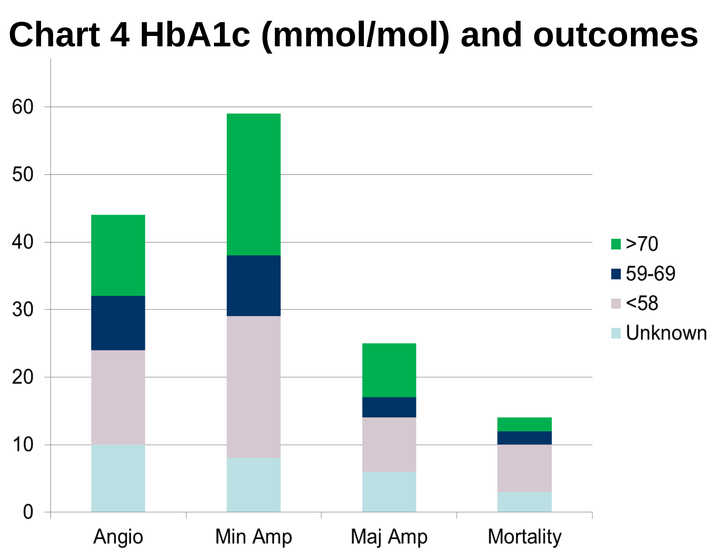
		Male	Female	Total
Number of patients		147	61	208
Age (mean years)		67.8	59.7	67.7
Hospital stay (mean days)		18.3	14.1	17.5 (±14)
Foot Co-morbidity	Neuropathic	4	0	4 (1.9%)
	Ischaemic	85	30	115 (55.3%)
	Neuro-ischaemic	51	28	79 (38%)
	Unknown	7	3	10 (4.8%)
Ulcer	None	20	8	28 (13.5%)
	1	94	35	129 (62%)
	2≤	32	19	51 (24.5%)
Outcomes	Angioplasty	37	7	44 (21.2%)
	Minor Amputation	45	8	60 (28.8%)
	Major Amputation	21	5	26 (12.5%)
	Mortality < 1yr	10	3	13 (6.3%)





Charts 1-4: Prognostic value of raised CRP, Neutrophils, White Cell Count and HbA1c to outcomes





* = statistically significant (see text)

Discussion:

Raised CRP, WCC and neutrophils were found to be strongly associated with increased risk of major amputation with statistical significance, (all p values of <0.01). For minor amputations, however, there were no significant differences. For death within 1 year both, WBC and neutrophils were significant ($p<0.05$ and $p<0.01$ respectively) when comparing those that died within 1 year versus those that didn't. For major amputation, all the prognostic factors (except HbA1c) were significant ($p<0.01$) when comparing amputation versus no amputation. For angioplasty, CRP was the only significant factor ($p<0.05$) when comparing the medians of angioplasty versus no angioplasty. HbA1c, WCC and neutrophils had no significant prognostic value in predicting the need for angioplasty.

Conclusions:

1. Admission CRP, White Cell Count and neutrophil count are potential prognosticators for major amputations.
2. Admission WCC and neutrophils were statistically significant in likelihood of mortality < 1year
3. In this cohort, inflammatory markers and HbA1c had limited usefulness in predicting other patient outcomes

References: 1. NHS Diabetes. National Diabetes Inpatient Audit (NaDIA) 2010. Available from: www.yhpho.org.uk/resource/item.aspx?RID=106455 2. Edmonds M, Foster A, The use of antibiotics in the diabetic foot, Am J Surg, 2004 May; 187(5A): 25S-28S 3. Boulton AJ, Meneses P, Ennis WJ, Diabetic foot ulcers: A framework for prevention and care, Wound Repair Regen, 1999 Jan-Feb; 7(1): 7-16 4. Holman N, Young RJ, Jeffcoate WJ, Variation in the recorded incidence of amputation of the lower limb in England, Diabetologia, 2012;55(7):1919-1925 5. Charlson ME, Pompei P, Ales KL, MacKenzie CR, A new method of classifying prognostic comorbidity in longitudinal studies: development and validation, J Chronic Dis, 1987;40(5):373-83

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