The future of vascular surgery will be addressing diabetic foot disease

Wesley Stuart
Queen Elizabeth University Hospital
Glasgow
Natural History of DM Foot Ulcers
Natural History of DM Foot Ulcers

Major adverse events
- Amputation
- Recurrence
- Septic episode
- Death
Natural History of DM Foot Ulcers

Multiple personnel and Therapies

- Physicians
- Nurses
- Surveillance
- Off-load
- Surgery
  - Ortho
  - Vascular
- Orthotics
- Podiatry
- Education
- Psychological support

Major adverse events
- Amputation
- Recurrence
- Septic episode
- Death

Prevention

Ucer

Healing
Natural History of DM Foot Ulcers

Disease Progression

- PAOD
- Neuropathy
- Infection
- Deformity

Multiple personnel and Therapies

- Physicians
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Incidence and Prevalence of DM in UK

Diabetes Obes Metab 2017 Zhgebi et al
Incidence and Prevalence of DM in UK

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Panel I Incidence rates

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Panel II Prevalence rates

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Age group

Four nations
Incidence and Prevalence of DM in UK

Panel I Incidence rates

Panel II Prevalence rates

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Incidence and Prevalence of DM in UK

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Diabetes Obes Metab 2017 Zhgebi et al
Incidence and Prevalence of DM in UK

Panel I Incidence rates

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MALES | FEMALES | MALES | FEMALES

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Four nations

Deprivation

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Incidence and Prevalence of DM in UK

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**FEMALES**

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Incidence and Prevalence of DM in UK

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Age group

Four nations

6% and rising for most deprived
3% and falling for least deprived

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Scottish Incidence Trends for DM with Deprivation

Life expectancy after diagnosis of type 2 DM (UKPDS outcomes model)

**Instructions on how to use the Tables:**
1) Identify the table relating to the person’s age, smoking history, and Hba1c level.
2) Within the table choose the cell nearest to the person’s total:HDL ratio and systolic blood pressure.
**Life expectancy after diagnosis of type 2 DM (UKPDS outcomes model)**

### MEN

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<tr>
<th>Age 75</th>
<th>Non-smoker</th>
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Impact of Type 2 DM and poverty on IHD Mortality

Fig. 1 Age-standardised IHD mortality rates by SES for men (a) and women (b) with (black squares) and without (white circles) type 2 diabetes. Error bars are 95% CIs

Jackson et al Diabetologica 2012
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Jackson et al Diabetologica 2012
Deprivation and illness behaviour

• Deprivation-associated health behaviour
  – Late disease presentation
  – Crisis engagement with health care providers
  – Poor concordance with treatments
  – Non-standard routes to care (eg via ED not GP or OPD)
    – “Crash-landers” with septic crisis- emergency amp

• Poorer outcomes for management of most conditions

• Highest rates of smoking
Prevalence of obesity in Scotland

Figure 2.5
Prevalence of BMI $\geq$ 30, by SIMD and sex (age-standardised)

Source: Scottish Health Survey 2011
Smoking by deprivation trends (SHeS)

Source: Usher Institute for Health Sciences and Infomatics, University of Edinburgh
Life expectancy in Scotland

Life expectancy (LE) and healthy life expectancy (HLE) at birth, by deprivation decile in Scotland, MALES, 5-year period 2009-2013

LE (95% confidence intervals shown as error bars)  HLE (95% confidence intervals shown as error bars)

Source: abridged life tables (see technical report), using NRS mid-year population estimates and death registrations (by year of registration) and 2011 Census self-assessed health (reported as very good/good).
Analysis by ScotPHO ISD.
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SIMD Decile

0 10 20 30 40 50 60 70 80 90

LE or HLE (years)

SIMD 10 (least deprived)  SIMD 9  SIMD 8  SIMD 7  SIMD 6  SIMD 5  SIMD 4  SIMD 3  SIMD 2  SIMD 1 (most deprived)  SCOTLAND

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Socio-economic Deprivation Levels in Scotland
Impact of Deprivation on Vascular Interventions

SIMD Quintiles for Vascular Interventions

Odds Ratios for Vascular Interventions – Most and Least Deprived Quintiles

- Amputation
- Carotid
- Limb Salvage
- AAA Repair

*SIMD 1* *SIMD 2* *SIMD 3* *SIMD 4* *SIMD 5*
Major amputations in Scotland. Data courtesy of Scottish Physiotherapy Audit and Research Group.
Major amputations in Scotland. Data courtesy of Scottish Physiotherapy Audit and Research Group.
• 67% of those housebound were single room living

• More people reported their Quality of Life as “worse than death” in SIMD 1

• Quality of life is better if limb fitted

*6 Months
*12 Months
 ★ p<0.001
Survival following amputation and limb-fitting
Convergence of factors

• Rise in prevalence of DM
• Changes in service provision
  – Rise of DM foot clinics and screening (lead time bias)
  – Reduction in ortho and general surgical involvement
  – Vascular centralisation: distant
• Effects of changing population
  – Living longer with chronic disease (including DM)
  – New manifestations of disease due to duration
Conclusions

• The prevalence of DM is rising and therefore DFU rates will increase
• The impact will be very different by geography
• The disease will probably become increasingly difficult to manage
• Preventative strategies will likely impact differently on different populations