Preventing recurrence of venous leg ulcers: Current evidence and future research

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Background

- Chronic leg ulcers affect 1–3% of those aged >60 years
- Difficult and costly to heal
- After healing, there is a recurrence rate up to 70%
- Greatest risk of recurrence is in the first 3 months
- Without intervention, 50% recur within the first 12 months
Current evidence

• After healing, use of compression therapy (for life) reduces ulcer recurrence rates.\(^1\)\(^{-4}\) (II)
  
Class 3 compression (40mmHg) is recommended, or the highest level of compression tolerated \(^1\),\(^2\),\(^4\) (II)

• Venous investigation and surgery for superficial VI \(^3\),\(^4\) (I)

• Regular follow-up and skin checks \(^1\),\(^2\) (EO)

• Skin care, lower limb exercise and elevation of affected limb \(^1\)-\(^4\) (EO)

1. RCN. The management of patients with venous leg ulcers.2006, London: RCN
3. AWMA, ANZ Clinical Practice Guidelines for Prevention and Management of Venous Leg Ulcers. 2011, Barton; ACT:AWMA

Current evidence

• Evidence-practice gap in use of compression therapy

• Wearing compression hosiery for life is a problematic strategy, problems with comfort, cost, and difficulties with application

• Adherence rates notoriously low \(^1\)

• Studies have found only 2 - 10% of patients suitable for surgery \(^2\)

• Clients expected to manage their own CVI
  - often with limited support
Influences on long term adherence in other chronic conditions

- Patient disempowerment
- Physical impairment
- Lack of family involvement
- Male gender

* Adherence varies according to the required activity

Research 2006 - 2010

Aim

Identifying factors associated with recurrence of venous leg ulcers

Specifically, to determine relationships between recurrence and:

- demographic and health variables
- level of physical activity
- psychosocial variables, and
- self care activities to prevent recurrence
Methods

Two studies:
1. Patient survey and retrospective chart & database review
2. Prospective longitudinal study

- Study 1: patients who had been treated for a venous leg ulcer and had healed 12 – 36 months prior to the study
- Study 2: patients recruited within 4 weeks of healing of a VLU and followed up 3 monthly for 12 months

- Participants recruited from hospital outpatient clinics, community clinics and community nursing services

- Exclusion criteria: cognitive impairment, unable to understand English, ABPI <0.8 or >1.2

Data Collected / Instruments

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Psychosocial</th>
<th>Clinical</th>
<th>General health</th>
<th>Preventive activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>age</td>
<td>Geriatric Depression Scale</td>
<td>Comorbidities</td>
<td>Yale Physical Activity Survey</td>
<td>Compression level, duration</td>
</tr>
<tr>
<td>Gender</td>
<td>MOS Social Support Scale</td>
<td>Venous history (surgery, DVT)</td>
<td>Mobility level</td>
<td>Leg elevation</td>
</tr>
<tr>
<td>Marital status</td>
<td>General Self Efficacy Scale</td>
<td>Previous ulcer size</td>
<td>Mini-Nutritional Assessment SF</td>
<td>Ankle exercises</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>Quality of life (SF-12)</td>
<td>Previous ulcer duration</td>
<td>Body Mass Index</td>
<td>Skin care</td>
</tr>
</tbody>
</table>
Results - Sample

- Study 1 - 122 participants
- Study 2 - 80 participants

Results - recurrence

**Study 1**: 68% ($n = 83$) had recurred by 36 months
- 36% recurred within 3 months of healing
- 56% recurred by 12 months
- 64% recurred by 2 years

**Study 2**: 44% ($n = 35$) recurred by 12 months
- Median time to recurrence was 27 weeks
- 21% recurred within 3 months
Study 1 results – logistic regression model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>Sig.</th>
<th>Variable contribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leg elevation</td>
<td>0.04</td>
<td>0.01 – 0.17</td>
<td>&lt;0.001</td>
<td>25</td>
</tr>
<tr>
<td>Self efficacy</td>
<td>0.83</td>
<td>0.72 - 0.94</td>
<td>0.006</td>
<td>12</td>
</tr>
<tr>
<td>Activity Index</td>
<td>0.95</td>
<td>0.92 - 0.98</td>
<td>0.010</td>
<td>11</td>
</tr>
<tr>
<td>Compression</td>
<td>0.53</td>
<td>0.34 – 0.81</td>
<td>0.004</td>
<td>10</td>
</tr>
<tr>
<td>Cardiac disease</td>
<td>5.03</td>
<td>1.01 – 24.9</td>
<td>0.048</td>
<td>5</td>
</tr>
<tr>
<td>Ulcer duration</td>
<td>1.01</td>
<td>1.00 – 1.03</td>
<td>0.054</td>
<td>4</td>
</tr>
</tbody>
</table>

Goodness of fit of model: $\chi^2 = 57.7$, $p < 0.001$

Nagelkerke $R^2$ 0.62

Study 2: Regression model

- Cox proportional hazards regression model
  $(\chi^2 = 97.9, p < 0.001; \ R^2 \text{ equivalent} = 0.72)$

- Adjusting for all variables, shorter time to recurrence remained significantly associated with:
  - < 30 minutes/day leg elevation
  - < 6 days/week wearing compression hosiery
  - Lower General Self Efficacy scale scores
  - Lower levels of social support
  - Male gender
  - Higher levels of physical activity
Study 2: Self management of CVI

Study 2 also looked at the factors associated with long term adherence to:

- compression therapy
- leg elevation
- lower leg or ankle exercising

Results - long term adherence

- Significant decrease in adherence to all 3 activities over 12 months
- Biggest decreases occurred between 6 and 12 months
- Repeated measures regression model found significant interaction effects with decreased adherence to compression over time and:
  - Depression $(p = 0.002)$
  - Less than 2 follow-up care visits /year $(p = 0.010)$
  - Impaired mobility $(p = 0.015)$
  - Lack of knowledge of cause of ulcers $(p = 0.021)$
Results - long term adherence

Adherence to leg elevation over time was associated with:

- Osteoarthritis  \( p = 0.009 \)
- Depression  \( p = 0.010 \)
- Cardiac disease  \( p = 0.032 \)

Adherence to ankle or leg exercises over time and:

- History of multiple previous ulcers  \( p = 0.008 \)
- ↓ Socio-Economic Index  \( p = 0.019 \)
- Lack of regular follow-up health checks  \( p = 0.029 \)

Overview

Four variables strongly associated with recurrence:

- leg elevation
- self efficacy
- compression hosiery
- level of physical activity

Factors promoting adherence to preventive activities:

- Need for regular follow-up well leg checks after healing
- Need to screen and manage depression
- Knowledge of condition
- Social support
Future research: 2012 – 2016

- Randomised controlled trial of leg elevation and calf muscle exercise interventions
- Investigation of biomarkers and symptom clusters associated with VLU recurrence
- Development, trialling and evaluating new models of care to promote self management of CVI and prevent recurrence

Thank You

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Royal College of Nursing Australia
QUT RCB Scholarship