Chemotherapy-induced peripheral neuropathy: Determining impacts on cancer survivors

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Chemotherapy-induced peripheral neuropathy

- CIPN is a major side effect of cancer treatment
- Reduces treatment tolerability
- Leads to long term deficits
CIPN and Cancer Survival

Data derived from: AIHW Cancer in Australia: an overview 2014; 5 year relative survival from selected cancers, Australia 2007-2011
Patient Reported Outcomes and CIPN

The magnitude of neurotoxicity in patients with multiple myeloma and the impact of dose modifications: results from the population-based PROFILES registry

Antoinetta J.M. Fan
Monique C. Mina

DOI 10.1007/s10549-010-1278-0

Association between patient reported outcomes and quantitative sensory tests for measuring long-term neurotoxicity in breast cancer

Dawn L. Hersh
Antai Wang
Deborah Fuen

Long-Term Neurotoxicity Effects of Oxaliplatin Added to Fluorouracil and Leucovorin as Adjuvant Therapy for Colon Cancer: Results from National Surgical Adjuvant Breast and Bowel Project Trials C-07 and LTS-01

Kelley M. Kidwell; Greg Yothers, PhD; Patricia A. Ganz, MD; Stephanie R. Land, PhD; Clifford Y. Ko, MD; Reena S. Cecchini, PhD; Jacek A. Kopac, PhD; and Norman Wolmark, MD
CIPN research gaps

- No method of identifying at-risk patients
- Lacking quantitative and functionally relevant assessment tools
- No effective neuroprotection
- Impact is poorly understood in cancer survivors

- National survey of cancer survivors
- Aim: to address the impact of CIPN on an Australia-wide level
  - Anonymous online survey
  - Inclusion: must have received neurotoxic chemotherapy
Recruitment Strategy

• National recruitment via:
  • Cancer support and survivorship organisations
  • Social media
  • Research databases
  • Hospitals
Online platform
## Survey content

<table>
<thead>
<tr>
<th>Item content</th>
<th>Validated measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
</tr>
<tr>
<td>Cancer diagnosis and treatment</td>
<td></td>
</tr>
<tr>
<td>CIPN symptoms</td>
<td>• FACT/GOG-NTx neurotoxicity subscale</td>
</tr>
<tr>
<td></td>
<td>• DN4 neuropathic pain measure</td>
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<tr>
<td>Other cancer-related side effects</td>
<td></td>
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<tr>
<td>Physical activity levels</td>
<td>• International Physical Activity Questionnaire</td>
</tr>
<tr>
<td>Non-cancer health conditions</td>
<td>• Self-Administered Comorbidity Questionnaire</td>
</tr>
<tr>
<td>Quality of Life</td>
<td>• Short-Form 36 (SF-36)</td>
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</tbody>
</table>
**Results: Demographics**

- 431 respondents
- Mean age: 58 ± 9.9 years
- Age range: 21 – 83 years
- 85.4% female

<table>
<thead>
<tr>
<th>Cancer type</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Breast cancer</td>
<td>67.8%</td>
</tr>
<tr>
<td>Myeloma</td>
<td>10.7%</td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>7.4%</td>
</tr>
<tr>
<td>Ovarian cancer</td>
<td>4.6%</td>
</tr>
</tbody>
</table>
# Results: Demographics

<table>
<thead>
<tr>
<th>Chemotherapy type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Docetaxel</td>
<td>37.1%</td>
</tr>
<tr>
<td>Paclitaxel</td>
<td>34.1%</td>
</tr>
<tr>
<td>Carboplatin</td>
<td>10.2%</td>
</tr>
<tr>
<td>Thalidomide</td>
<td>8.8%</td>
</tr>
<tr>
<td>Oxaliplatin</td>
<td>7.9%</td>
</tr>
<tr>
<td>Bortezomib</td>
<td>7.7%</td>
</tr>
<tr>
<td>Don’t know name of chemotherapy</td>
<td>12.1%</td>
</tr>
</tbody>
</table>
Neuropathic Symptoms

- 80% report CIPN after completing chemotherapy
- Average duration of CIPN: 3.35 ± 3.21 years
- Range of duration of CIPN: <1 year – 22 years

- 74% report currently experiencing CIPN
- 13% have received any treatment for CIPN
- 25% of those with CIPN report no improvement in symptoms since finishing chemotherapy
Neuropathic Symptoms

Numbness and tingling in hands (%)
- 60% experience this symptom to some degree

Numbness and tingling in feet (%)
- 69% experience this symptom to some degree
Neuropathic Symptoms: Functional Difficulties

- Difficulty buttoning buttons: 40%
- Difficulty feeling small objects: 30%
- Difficulty walking: 50%
## Impact of chemotherapy side effects

<table>
<thead>
<tr>
<th>Side effect</th>
<th>% rating: biggest impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>42.9%</td>
</tr>
<tr>
<td>CIPN</td>
<td>21.8%</td>
</tr>
<tr>
<td>Pain</td>
<td>13.0%</td>
</tr>
<tr>
<td>Insomnia</td>
<td>9.7%</td>
</tr>
<tr>
<td>Changes in sexual function</td>
<td>9.7%</td>
</tr>
<tr>
<td>Anxiety</td>
<td>9.1%</td>
</tr>
</tbody>
</table>
Impact of CIPN

• Respondents with CIPN had lower QoL (SF-36 total score; \( p < 0.001 \))
  • Physical Functioning (\( p < 0.001 \))
  • Bodily Pain (\( p < 0.001 \))
  • General Health (\( p < 0.001 \))
  • Vitality (\( p = 0.001 \))

• 57% of participants were ‘limited a lot’ in undertaking vigorous physical activity
  • Those with CIPN had scores indicating greater limitations (\( p < 0.01 \))

• CIPN has an impact on QoL, across domains associated with poorer physical health and energy levels
Conclusions

- CIPN has a significant impact on cancer survivors
  - Experienced by a significant percentage of those who receive neurotoxic chemotherapy
  - Breast cancer survivors are a major group who experience CIPN
  - Symptoms often last for years
  - A proportion of respondents see no improvement in symptoms with time
  - Affects QoL across a range of domains
  - Lasting impact supports need for further research into assessment, prevention and treatment

- Survey runs until mid 2018
- Facebook: [www.facebook.com/infocus.study](http://www.facebook.com/infocus.study)
Acknowledgements

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• Prof David Goldstein
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  • Cancer Institute New South Wales
  • National Health & Medical Research Council

• Survey link: http://www.infocussstudy.org.au/survey/
• Facebook: www.facebook.com/infocus.study