HOODINI: A multicentre point prevalence study of hospital onset diarrhoea

Damian Mawer, Fiona Byrne, Sarah Drake, Claire Brown, Ben Warne, Rachel Bousfield, Jordan Skittrall, Mark Wilcox, Robert West, Andrew Kirby, Jonathan Sandoe & the HOODINI Collaborators

Conflicts of interest = None
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Background

- CDI-reduction guidelines in England encourage collection of data on hospital-onset diarrhoea (HOD) prevalence and management\(^1\)
- Evidence suggests HOD is common (12% point prevalence in US tertiary centre) \(^2\)
- It is associated with significant morbidity, mortality and economic impact (e.g. Clostridium difficile infection (CDI), norovirus) \(^3,4\)
- Limited data for general medical, surgical and elderly care wards

1) NHS England. 2014  
2) Garey. Ann Pharmacother, 2004  
4) Lopman. Emerg Infect Dis. 2004
Methods 1: Location and timing

• Point prevalence survey
• 32 acute hospitals
• 141 wards:
  • 63 medical
  • 52 surgical
  • 26 elderly care
• 1 day in each of 2 time periods:
  • 11-22 January 2016
  • 6-17 June 2016
• Standardised data collection forms
Methods 2: Definitions and data collection

• Patients admitted >72 hours screened for HOD

• HOD:
  • ≥2 episodes of type 5-7 stool (Bristol Stool Chart) in the 24 hours before the survey day, with diarrhoea onset >48 hours after admission \(^1\)

• Information sources:
  • Patient, medical records, bedside charts, staff, other (e.g. relatives)

• Additional data collected from patients with HOD
  • Clinical features, potential causes, investigation, management

• Ward / hospital data:
  • Ward admissions, CDI testing and Infection Control policies

\(^1\) Garey. Ann Pharmacother, 2004
Results 1: Overview

- No. of occupied beds: 6635
- Admitted >72 hours: 5329
- On ward ≤72 hours: 1306
- No. of eligible patients: 5142
  - HOD: 230
  - No HOD: 4912
- No. excluded: 187 (end of life 67, other reasons 120)
Results 2: Prevalence

• HOD point prevalence = 3.57% (95%CI 3.13 – 4.03%)

<table>
<thead>
<tr>
<th>Hospital type</th>
<th>Point prevalence of HOD (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>District general (DGH)</td>
<td>2.2</td>
<td>1.56, 2.86</td>
</tr>
<tr>
<td>Teaching</td>
<td>4.79</td>
<td>3.77, 5.69</td>
</tr>
</tbody>
</table>

• OR for teaching hospital versus DGH = 2.21 (1.57 – 3.12)
• Prevalence unaffected by specialty, ward characteristics and season
Results 3: Potential causes of HOD

- 97% patients had ≥1 potential cause of HOD
- 85% multiple possible causes (median 3; range 2 – 13)
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• 97% patients had ≥1 potential cause of HOD
• 85% multiple possible causes (median 3; range 2 – 13)

<table>
<thead>
<tr>
<th>Potential Cause</th>
<th>No. of patients (%; n = 230)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying condition</td>
<td>107 (47)</td>
</tr>
<tr>
<td>Antimicrobials</td>
<td>125 (54)</td>
</tr>
<tr>
<td>Other medication</td>
<td>195 (85)</td>
</tr>
<tr>
<td>CDI</td>
<td>9 (4)</td>
</tr>
<tr>
<td>Norovirus</td>
<td>3 (1)</td>
</tr>
</tbody>
</table>
Results 3: *Clostridium difficile* testing

- Only 75 (33%) of HOD patients were tested for CDI after diarrhoea onset
- 71% tested on the day of diarrhoea onset, or following day
- Further 7 (3%) patients tested up to 14 days before HOD onset

- 9 patients toxin positive
  - 12% patients tested
  - 4% all HOD patients
  - (Further 4 patients GDH positive, toxin negative)
## Results 4: Potential causes of HOD in patients tested for CDI versus those not tested

<table>
<thead>
<tr>
<th></th>
<th>No CDI test, No. (%)</th>
<th>CDI test, No. (%)</th>
<th>Adjusted OR (95% CI)</th>
<th>P value</th>
</tr>
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<tbody>
<tr>
<td>Total</td>
<td>155</td>
<td>75</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age (mean ± SD)</td>
<td>73 ±17</td>
<td>73 ±15</td>
<td>1.00 (0.98, 1.03)</td>
<td>0.80</td>
</tr>
<tr>
<td>Sex (m)</td>
<td>76 (49)</td>
<td>34 (45)</td>
<td>0.85 (0.45, 1.63)</td>
<td>0.70</td>
</tr>
<tr>
<td>No. of potential causes of HOD / patient (median)</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Any underlying condition</td>
<td>74 (48)</td>
<td>33 (44)</td>
<td>0.77 (0.40, 1.49)</td>
<td>0.70</td>
</tr>
<tr>
<td>Receiving antimicrobials</td>
<td>78 (50)</td>
<td>47 (63)</td>
<td>1.73 (0.89, 3.37)</td>
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<tr>
<td>Any other medication that can cause diarrhoea</td>
<td>130 (84)</td>
<td>65 (87)</td>
<td>1.38 (0.52, 3.62)</td>
<td>0.72</td>
</tr>
<tr>
<td>Pre-hospital medication only potential cause of HOD</td>
<td>17 (11)</td>
<td>4 (5)</td>
<td>0.42 (0.11, 1.59)</td>
<td>0.25</td>
</tr>
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<td>No. of diarrhoea episodes in 24 hr before the survey (median)</td>
<td>3</td>
<td>3</td>
<td>1.10 (0.94, 1.29)</td>
<td>0.26</td>
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<td>HOD documented in medical notes</td>
<td>59 (38)</td>
<td>58 (78)</td>
<td>6.47 (3.31, 12.66)</td>
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Results 5: HOD management

• Only 35% of patients had a documented medical assessment - may indicate a lack of awareness\(^1\) or concern amongst medical staff

• 40% patients had ≥1 additional investigation

• 27% patients had ≥1 treatment stopped / started / adjusted
  • Started: IV fluids, CDI treatment
  • Stopped: laxatives, antimicrobials, PPI

• Only 24% of patients not already in a side room were isolated (overall 63% HOD patients were not isolated)

Conclusions

• HOD affects large numbers of hospital patients (>68,000 beds in included specialities in England → ~2450 patients/day) ¹

• Multiple potential causes, mainly iatrogenic, can be identified in most patients – many potentially reversible

• Majority of patients with HOD…
  • Were not tested for CDI
  • Had no documented evidence of a medical assessment
  • Were not isolated

• Potential consequences
  • CDI cases may be missed
  • Risk of onward transmission of C. difficile

¹) Health and Social Care Information Centre, 2017