Audit of outcomes in HIV

BHIVA Audit and Standards Sub-Committee

Aims

To assess outcomes for patients with established HIV:
- In care
- In and out of care.

Audit of outcomes not care quality
- Patient factors such as poor adherence explicitly not taken into account.
Aims

To test feasibility of assessing outcomes at individual sites.

Rationale: from 2013, HIV/STI audit to be procured nationally with requirements of:

- Systematic annual re-audit of key outcomes
- Publication of site-level findings.
Methods

Case-note review in October-December 2011 of patients previously seen for HIV care during 2009.

100 patients per site to provide statistically meaningful site-level data.

Denominators based on patients:
- Still in care at same clinic
- As above, plus not in care but not known to have died, transferred or left UK.
## Patient characteristics

<table>
<thead>
<tr>
<th></th>
<th>N = 12975</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7794</td>
<td>60.1</td>
</tr>
<tr>
<td>Female</td>
<td>4917</td>
<td>37.9</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>6729</td>
<td>51.9</td>
</tr>
<tr>
<td>Black-African</td>
<td>5075</td>
<td>39.1</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-39</td>
<td>4979</td>
<td>38.6</td>
</tr>
<tr>
<td>40+</td>
<td>7931</td>
<td>61.4</td>
</tr>
<tr>
<td><strong>Route of HIV acquisition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>7404</td>
<td>57.1</td>
</tr>
<tr>
<td>MSM</td>
<td>4533</td>
<td>34.9</td>
</tr>
<tr>
<td>IDU</td>
<td>305</td>
<td>2.4</td>
</tr>
</tbody>
</table>

NB: numbers and totals do not add because of missing data and values not shown.
Case mix variation

Sites with HIV caseload >1000:
- Older patients
- Earlier dates of ART initiation.

Small (≤100) and large (>1000) sites:
- More white, male, MSM than medium sites
- Fewer black-African, female, heterosexual.
Random and systematic case-mix variation

Percentage of black-African patients

Site caseload

<100

100-1000

>1000
Data submitted for 12975 patients seen for care in 2009

11292 (87.0%) “in & out of care”

10565 (81.4%) care at same clinic

Of which 9207 (87.1%) were on ART

10308 (79.4%) care at same clinic and seen during 2011

Exclude from analysis:
1250 (9.6%) transferred care to different UK clinic
267 (2.1%) left UK
166 (1.3%) died

Exclude from “in care” analysis:
575 (4.4%) stopped attending, but not known to have transferred, left the UK or died
65 (0.5%) not known
87 (0.7%) not answered
Main outcome measures
## Planned poor outcome definition

<table>
<thead>
<tr>
<th>Criteria for poor outcome</th>
<th>Exceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>On ART, VL &gt;100</td>
<td>Recent (re)start</td>
</tr>
<tr>
<td></td>
<td>Probable blip, provided VL &lt;200, or VL &lt;1000 and measured within last 60 days</td>
</tr>
<tr>
<td></td>
<td>Considered not of clinical concern, provided VL &lt;200</td>
</tr>
<tr>
<td>On ART, VL not measured within 230 days preceding audit</td>
<td></td>
</tr>
<tr>
<td>Not on ART, CD4 &lt;350</td>
<td></td>
</tr>
<tr>
<td>Previously but not currently on ART</td>
<td>Stopped after MTCT prevention</td>
</tr>
<tr>
<td>Not seen in clinic during 2011</td>
<td>Seen in 2010 and considered stable and not needing to be seen frequently</td>
</tr>
</tbody>
</table>
## Poor outcome rates: corrected data

<table>
<thead>
<tr>
<th>Patients in and out of care</th>
<th>Poor outcome rate</th>
<th>Poor outcomes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients in care</td>
<td>7.1%</td>
<td>751</td>
<td>10,565</td>
</tr>
<tr>
<td>Patients in care and seen during 2011</td>
<td>6.4%</td>
<td>659</td>
<td>10,308</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients in and out of care</th>
<th>Poor outcome rate</th>
<th>Poor outcomes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients in care</td>
<td>7.1%</td>
<td>751</td>
<td>10,565</td>
</tr>
<tr>
<td>Patients in care and seen during 2011</td>
<td>6.4%</td>
<td>659</td>
<td>10,308</td>
</tr>
</tbody>
</table>
## Variation in poor outcome rates by patient and site characteristics

<table>
<thead>
<tr>
<th></th>
<th>In and out of care</th>
<th>In care</th>
<th>In care and seen during 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>12.1%</td>
<td>7.1%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Male</td>
<td>10.9%</td>
<td>6.7%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Female</td>
<td><strong>13.9%</strong></td>
<td><em>7.8%</em></td>
<td>7.0%</td>
</tr>
<tr>
<td>White</td>
<td>10.0%</td>
<td>6.9%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Black-African</td>
<td><strong>14.7%</strong></td>
<td>7.2%</td>
<td>6.4%</td>
</tr>
<tr>
<td>MSM</td>
<td>9.6%</td>
<td>6.3%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Heterosexual</td>
<td><strong>12.9%</strong></td>
<td>7.3%</td>
<td>6.6%</td>
</tr>
<tr>
<td>ART initiated 2005 or earlier</td>
<td>9.3%</td>
<td>6.6%</td>
<td>6.0%</td>
</tr>
<tr>
<td>ART initiated 2006 or later</td>
<td>9.6%</td>
<td>6.2%</td>
<td>5.7%</td>
</tr>
<tr>
<td>&lt;100 site caseload &lt;1000</td>
<td>12.3%</td>
<td>7.1%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Site caseload &gt;1000</td>
<td>12.6%</td>
<td>7.2%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Site caseload &lt;100</td>
<td>11.8%</td>
<td>7.9%</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

** Significant at 99%. * Significant at 95%.**
Possible outlier sites

Funnel plot: corrected data, patients in and out of care

Source: BHIVA audit 2011-12
Problems with outcome definition

Burdensome for sites to provide sufficient data.

Data quality issues – missing data and errors, especially dates and reasons for exceptions.

Action taken in response:

- Corrected missing data by imputing. E.g. if attendance date given but VL date missing, assume the same
- Tested simpler definition of poor outcome for potential future use
  - On ART with VL >200
  - Not on ART, CD4 <350.
Comparison of outcome measures: poor outcome rates for patients seen for care during 2011 by site caseload
Secondary outcomes
London CQIN viral load outcome

London

- ≥90% adults starting ART to have <50 copies/ml within 3-15 months, excluding pregnant women and those with no available measurement (achieved 2010: 93%).

BHIVA audit

- No direct comparison
- 9070 patients in care on ART with available result, 83.2% had undetectable VL and a further 10.4% had detectable VL <100 copies/ml.
London CQIN CD4 targets

London

- ≥95% of adults in care for at least one year at the same site to have ≥200 cells/mm$^3$ (achieved 2010: 96%)
- ≥90% to have ≥350 cells/mm$^3$ (achieved 2010: 83%).

BHIVA Audit

- Of 10565 patients in care, 94.9% had >200 and 80.8% >350 cells/mm$^3$
Percentage of patients in care & seen during 2011 with CD4 ≤200 cells/mm³ by site caseload and whether on ART
Other secondary outcomes

Cardiovascular risk monitoring
Assessment of adherence
Percentage of patients on ART, in care and seen during 2011 for whom lipids not measured in the past 3 years
Percentage of patients in care and seen during 2011 for whom blood pressure not recorded in the past 15 months
Percentage of patients on ART, in care and seen during 2011 for whom information on adherence not recorded in the past 12 months.
Conclusions: main outcome

Overall HIV treatment outcomes were excellent
- 87.9% of patients overall
- 93.6% of those attending for care.

Outcomes varied widely between sites.
- Poor outcomes might be attributed to patient factors
- Not a reflection of care quality.

Reassuring lack of systematic variation in outcomes for patients attending for care
- Variation among patients out of care requires further investigation
- Some possible outlier sites identified
- May partly reflect poor data quality.
Conclusions: monitoring

Recording of cardiovascular risk monitoring and adherence assessment was variable.
Conclusions: feasibility

The audit method posed problems and is not feasible for year-on-year repetition:

- Participants found it burdensome to provide data
- Errors and missing data affected site-level results significantly.

Data was imputed where feasible in this audit. In the future joint HIV/STI audit programme, sites may be judged on data quality as well as underlying outcomes.

Using a simpler outcome definition gave significantly different results.
Recommendations

Preparation for the HIV/STI National Clinical Audit and Patient Outcomes Programme should focus on:

- Improving outcome measures to assess quality of care with the minimum burden for participants
- Addressing data quality with automated data collection being a high priority.
Acknowledgements

All the centres who participated in this audit.