HIV testing of relevance to general practice

Second joint BHIVA/RCGP conference
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Collaboration for Leadership in Applied Health Research and Care
_______________ North Thames
HIV care continuum – GPs can support patients along their journey

Patient concerns about receiving care from GP (Keogh et al, 2016):
- Competence
- Collaboration
- Continuity
Patients, but not GPs want to test for HIV

- **Nationwide GP survey** (N=80): Major perceived barrier to testing are the patients (Hindocha et al, 2013)

- **Patient focus group** in Brighton (n=54): HIV testing in primary care preferable (Glew et al, 2014)

- HIV test coverage in non-traditional settings, including GPs (Elmahdi et al, 2015):

<table>
<thead>
<tr>
<th>Reason for testing</th>
<th>Test coverage</th>
<th>Patient acceptance</th>
<th>HIV positivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV indicator condition</td>
<td><strong>22.4%</strong> (13.9% - 30.9%)</td>
<td><strong>87.4%</strong> (57.7% - 100%)</td>
<td><strong>2.7%</strong> (1.1% - 4.4%)</td>
</tr>
<tr>
<td>Routine HIV testing</td>
<td><strong>29.5%</strong> (23.6% - 35.4%)</td>
<td><strong>69.2%</strong> (52.7% - 85.6%)</td>
<td><strong>0.4%</strong> (0.2% - 0.6%)</td>
</tr>
</tbody>
</table>
Want to avoid late diagnosis? Go and see a Dutch GP...

Most likely diagnosed late in UK*
(Public Health England, 2015)

More likely diagnosed in Dutch general practice
(Joore et al, 2016)

Heterosexual

Black African

>50 years

HIV Diagnosis in GP:
UK 10%
Holland 38%
Hackney: 28%

*People who inject drugs excluded
BHIVA 2008 – key ‘normalising’ HIV testing features

• Opt-out testing
  - Notify the patient that an HIV test will be performed unless the patient declines (NICE, 2011)
• Informed consent
• Lack of HIV prevention counseling.
BHIVA 2008 – recommendations for primary care

• Any health care worker competent to obtain consent and conduct an HIV test

• Routine HIV testing at GP registration in HIV prevalence area (>2/1000 adults)

• NICE 2011: Special consideration for MSM and black Africans.
The updated guidelines are expected to be broader and focus on populations at higher risk of HIV, including people:

- who live in areas or communities with a high prevalence of HIV
- whose lifestyle or sexual behaviour puts them at risk
- who have an illness that may be indicative of HIV infection

Primary care in high prevalence areas

- Anyone who receives a blood test for another reason
- Rapid point-of-care testing (POCT).
RHIVA2 – Applying BHIVA 2008 to general practice

Methods (Leber et al, 2015):
• Pragmatic cluster randomised controlled trial in Hackney (prevalence 8/1000)
• 20 intervention vs. 20 control practices
• Health care assistant offers opt-out POCT to new registrants

Can POCT at first presentation in general practice
• detect HIV earlier?
• diagnose more people living with HIV?

- RHIVA1 pilot demonstrating POCT feasibility and acceptability (Prost et al, 2009)
- TB screening trial (Griffiths et al., 2007)
RHIVA2 methods continued...

- Educational session, including competency training for POCT, lasting 1.5 hours
- Follow up training for practice lead nurse after 2 weeks
- Incentive payments: £300 one off, £10 per rapid test recorded.
POCT using INSTI™

- Finger prick test – result available in one minute
- Sensitivity = 99.6%; Specificity = 99.3%
- Any reactive test result needs confirmatory serology
- Quality Assurance (MHRA, 2010).
RHIVA2 safety netting

- Referral of any new diagnosis to an HIV clinic by the GP or senior nurse
- Failsafe for new diagnoses provided by the Homerton HIV liaison nurse
- Remote monitoring of HIV testing activity (EMIS codes) by the Clinical Effectiveness Group, QMUL.
## RHIVA2 results – New patient characteristics

Study period: April 2010 – August 2012

<table>
<thead>
<tr>
<th>Characteristics of new registrants</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of new registrants</td>
<td>44,971</td>
<td>38,464</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>35.9</td>
<td>35.1</td>
</tr>
<tr>
<td>Male</td>
<td>45%</td>
<td>45%</td>
</tr>
<tr>
<td>White</td>
<td>49%</td>
<td>57%</td>
</tr>
<tr>
<td>Black African</td>
<td>17%</td>
<td>15%</td>
</tr>
</tbody>
</table>
## Results - HIV testing and diagnoses

<table>
<thead>
<tr>
<th>HIV testing and diagnoses</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>POC tests offered</td>
<td>11,180</td>
<td>NA</td>
</tr>
<tr>
<td>POC tests received</td>
<td>4,978 (44.5%)</td>
<td>NA</td>
</tr>
<tr>
<td>POC tests confirmed positive*</td>
<td>11</td>
<td>NA</td>
</tr>
<tr>
<td>Total number of new diagnoses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black African</td>
<td>32 (incl. 3 antenatal)</td>
<td>14 (incl. 4 antenatal)</td>
</tr>
<tr>
<td>MSM</td>
<td>20 (63%)</td>
<td>8 (57%)</td>
</tr>
<tr>
<td>Total number of patients defaulted care &gt;12 months**</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

*All patients were successfully transferred to secondary care

** Indicating patients re-entering specialist care via general practice.
Primary outcome: Increase in early diagnosis of HIV

New HIV diagnosis:
- Intervention n=32
- Control n=14

<table>
<thead>
<tr>
<th>CD4 count (cells/microL)</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>356 (SD 254)</td>
<td>270 (SD 257)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Square rooted CD4*</th>
<th>Coefficient</th>
<th>CI (95%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>3.1</td>
<td>-1.2 to 7.4</td>
<td>0.160</td>
</tr>
<tr>
<td>Intervention excl.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antenatal</td>
<td>6.4</td>
<td>1.2 to 11.6</td>
<td>0.017</td>
</tr>
</tbody>
</table>

*Mixed effect models allowing for a random effect of practice and adjusted for randomisation stratification factors, including practice list size, male HIV testing rate and IMD score.
Secondary outcome: Increased rate of new HIV diagnosis

New HIV diagnosis:
- Intervention n=32
- Control n=14

<table>
<thead>
<tr>
<th>Rate of new diagnosis (per 1000 patients per year)*</th>
<th>Coefficient</th>
<th>CI (95%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>4.5</td>
<td>1.3 to 16.0</td>
<td>0.021</td>
</tr>
<tr>
<td>Intervention excl. Antenatal</td>
<td>5.9</td>
<td>1.7 to 20.2</td>
<td>0.006</td>
</tr>
</tbody>
</table>

*Mixed effect models allowing for a random effect of practice and adjusted for randomisation stratification factors, including practice list size, male HIV testing rate and IMD score.
POCT in general practice – staff experiences

• **Pros:**
  “Yeah, I think, the impression I get is that they think that we’ve been quite thorough and that we’re, you know, so I think it, I think it promotes us.”

  “I think I just like doing it because it is good. When you think about the end result, is good. It makes you feel you have done something good as well.”

• **Cons:**
  Health care assistants and nurses may worry about time and the instantaneous nature of the POCT.

McMullen et al, 2015
POCT in general practice – patient experiences

• POCT in general practice broadly acceptable to newly diagnosed patients (5/11 interviewed)

• HIV testing, but not an HIV diagnosis can be normalised
  – Patients may chose to take part in routine HIV testing for a particular reason

• Routine testing lets people deal with their own exceptionalism.

Heather McMullen, PhD student, QMUL. Personal communication.
HIV-CLAHRC: Service evaluation of HIV testing and diagnosis in East London general practice

**Sexual health local enhanced service (SH LES)**

**Hackney:**
- RHIVA1 trial
- RHIVA2 trial
  - 20 intervention
  - 20 control

**Tower Hamlets:**
- RHIVA3 follow up
  - 32 practices
  - Late diagnosis service evaluation

**Newham:**
- Routine care

**Network improved service (NIS):**
- Promotion of serology HIV testing
- Incentive payments

Unpublished data.
City & Hackney Sexual Health LES increases HIV testing, and is sustainable long term.

Interrupted time series analysis, using a negative binomial random effects model

Unpublished data.
The Tower Hamlets sexual health network improved service is equally effective

**Interrupted time series analysis**, using a negative binomial random effects model

Unpublished data.
Hackney GPs continue to diagnose HIV

<table>
<thead>
<tr>
<th>Mode of Testing</th>
<th>Hackney (n=)</th>
<th>Tower Hamlets (n=)</th>
<th>Newham (n=)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHIVA2* trial  (2010-12)</td>
<td>35</td>
<td>2010-12</td>
<td>2010-12</td>
</tr>
<tr>
<td>Serology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POC</td>
<td>11</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

*RHIVA2 trial period: **29 months**; RHIVA2 Follow up: **35 months**

#Please note, results are preliminary: New diagnosis data awaiting validation by Public Health England.

Unpublished data.
HIV indicator conditions in primary care

Retrospective case notes review of new HIV diagnoses in Hackney general practice (n=89) (Wellesley et al, 2015)

<table>
<thead>
<tr>
<th>Indicator condition</th>
<th>Number of consultations per IC</th>
<th>Predictive value; OR (CI 95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphadenopathy of unknown cause</td>
<td></td>
<td>11.3 (4.5-28.3)</td>
</tr>
<tr>
<td>Bacterial pneumonia</td>
<td></td>
<td>47.7 (5.6-404.2)</td>
</tr>
<tr>
<td>Weight loss or chronic diarrhoea</td>
<td></td>
<td>13.4 (5.0-36.0) Weight loss</td>
</tr>
<tr>
<td>Multidermal herpes zoster</td>
<td></td>
<td>25.4 (5.0-36.0)</td>
</tr>
<tr>
<td>STI</td>
<td></td>
<td>10.8 (2.7-43.2)</td>
</tr>
<tr>
<td>Blood dyscrasia</td>
<td></td>
<td>5.7 (1.4 – 22.9)</td>
</tr>
<tr>
<td>Seborrhoeic dermatitis</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>Oral candidiasis</td>
<td></td>
<td>29.4 (6.9-125.5)</td>
</tr>
<tr>
<td>Mononucleosis type illness</td>
<td></td>
<td>NA</td>
</tr>
</tbody>
</table>

THIN case control study (n=939) (Damery et al, 2013)

Similar results: Joore et al, 2016
Think EBV? Test for HIV!

• Hsu et al, 2013:
  1046 primary care samples sent for EBV testing
  • 11 new diagnosis (GP: n=3)
  • 4 recently acquired (GP:1)

Source of image: 1º Festival international de Humor DST & AIDS, Ministério da Saúde, Brazil
Primary HIV infection commonly missed in general practice

- Typically glandular fever-like illness
- Incubation period: 2-4 weeks
- 30 - 80% symptomatic
- Fever, myalgia, rash, headache, and sore throat, lasting 1-2-(4) weeks.

Source of images: http://www.aids-images.ch/
Primary HIV Infection – other features

- May present with predominantly gastrointestinal disease
- Oral or genital ulcers
- Convalescent phase (up to 50%), including severe lethargy, malaise and low grade fever, lasting for months (Gaines et al, 1988).

Source of images: http://www.aids-images.ch/
Dying in transition – newly diagnosed patients most at risk

Krentz et al, 2014
Innovative HIV testing in the community

• POCT for personal use at home, available since 2011

• To expand access to HIV testing and to reduce barriers experienced in health care settings

• Online risk assessment and ordering test kits, opportunity for health promotion

• Home testing
  • Patient self-tests and reads result at home

• Home sampling
  • Patient posts blood sample to the clinic
  • Health advisor calls for any reactive result.
Dean Street @ Home

• Service evaluation of home sampling provided at the Dean Street Clinic website (Elliot et al, 2016)

• During the 2-year study period:
  • 17,361 people completed online risk assessment
  • 10,323 POCT kits ordered
  • 5696 kits returned

• 122 reactive result
  • **82 new diagnosis** (1.4% positivity rate); median CD4 505; 20% recent infections
  • 14 known positives
  • 11 unconfirmed; 14 false reactive.
Summary: Making HIV testing and diagnosis in general practice safe

• HIV testing must be meaningful – make sure patients enter secondary care safely following diagnosis

• Know your local prevalence and and engage with your community to inform service design
  – HIV indicator condition-targeted testing in any setting
  – Routine HIV testing in high prevalence areas for people attending a new patient check, sexual health screen, and to anyone having a blood test for another reason

• POCT effective at increasing uptake of HIV testing in primary care high prevalence areas and in the community
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References
