J R Coll Physicians Edinb 2014; 44: 278–82
http://dx.doi.org/10.4997/JRCPE.2014.405

HIV testing in Lanarkshire

[1]RR Acquah, [2]A Baggott, [3]C McGoldrick, [3]N Kennedy
[1]Specialist Registrar in Genitourinary Medicine, Brownlee Centre, Gartnavel General Hospital, Glasgow; [2]Specialty Registrar in Infectious Diseases, Bradford Royal Infirmary, Bradford; [3]Consultant in Infectious Diseases, Department of Infectious Diseases, Monklands Hospital, Airdrie, UK

ABSTRACT

Introduction The 2008 UK National Guidelines for HIV testing were designed in order to decrease the proportion of people living with undiagnosed HIV infection.

Aims Two audits were conducted. The aim of Audit 1 was to determine the proportion of current medical inpatients with an indicator condition that had been tested for HIV. Audit 2 aimed to identify missed opportunities for testing prior to diagnosis among newly diagnosed individuals with HIV.

Methods Audit 1 involved a case note review looking for indicator conditions and HIV testing of all inpatients. Audit 2 analysed the hospital case notes of all new Lanarkshire HIV patients in 2010 for previous missed diagnostic opportunities.

Results In Audit 1, 36% (63/174) of medical inpatients had a current indicator condition. Of the total population, 1.7% (3/174) had what would be an AIDS-defining condition if they had a positive HIV test. However, only 11% (7/63) of individuals were appropriately HIV tested. For Audit 2, 64% (9/14) of newly diagnosed individuals had previous missed opportunities for diagnosis.

Conclusion Increased education of clinical staff around testing guidelines is needed, as we have demonstrated that the 2008 guidelines are not being adhered to.

KEYWORDS AIDS, clinical indicator diseases, HIV guidelines, HIV testing, missed opportunities

DECLARATION OF INTERESTS No conflict of interest declared. This work was presented as a poster at the Third Joint Conference of BHIVA with BASHH (Liverpool 2014)

Correspondence to ***RR Acquah***
Brownlee Centre
Gartnavel General Hospital
1053 Great Western Road
Glasgow, G14 0YN
UK

e-mail ***r.acquah@nhs.net***

INTRODUCTION

The prevalence of HIV in the UK is increasing steadily each year and in 2012 was estimated at 1.5 per 1000 people.[1] These new infections are occurring in both men who have sex with men and heterosexual groups and it is thought that more infections were contracted in the UK than abroad.[1] An estimated 21,900 people living with HIV in the UK are unaware of their diagnosis.[1] Due to therapeutic advances over the past 30 years, since the first diagnosis of AIDS was made, the life expectancy of an individual living with HIV on treatment can now be expected to be near normal.[2] The morbidity and mortality increases significantly (tenfold in the first year)[1,3] with late diagnosis (defined as a CD4 count of less than 350 at diagnosis). Of all new diagnoses made in 2012, 47% were late diagnoses and this increased to 58% in the heterosexual population.[1]

Knowledge of an individual's HIV status allows interventions such as education on behaviour modification and potential treatment as a means to decrease onward transmission.[4,5]

In September 2008 the British HIV Association (BHIVA), the British Association for Sexual Health and HIV and the British Infection Society published the UK National Guidelines for HIV Testing;[6] these have been endorsed by the Royal College of Physicians.[7] The guidelines were intended to increase HIV testing in all clinical settings in order to reduce the proportion of individuals with undiagnosed HIV infection with the aim of benefiting both the individual and public health. The guidelines include a list of 'indicator conditions' and potentially AIDS-defining illnesses (in the context of a positive test) that should prompt the offer of an HIV test.[6]

AIMS

We designed two audit projects. The aims of Audit 1 were firstly to identify the number of current medical inpatients at Monklands Hospital who had one or more indicator conditions or potentially AIDS-defining conditions present and secondly to assess how many of these patients were offered an HIV test.

Audit 2 looked at all new diagnoses of HIV presenting to the Lanarkshire HIV clinic at Monklands Hospital in 2010. The aim was to identify previous missed opportunities for diagnosis (documented in secondary care notes), where clinicians had not tested for HIV despite an indicator condition being present.

METHODS

Audit 1

For the first audit we identified every patient occupying a medical bed (Renal, Infectious Diseases, Cardiology, Gastroenterology, Endocrinology, Dermatology, Haematology, General Medicine, Acute Medical Receiving Unit, High Dependency Unit and Respiratory) in Monklands Hospital on the 12 February 2012. Patients were excluded if they had a known diagnosis of HIV or their medical notes were not readily available at the time of data collection. All case notes were analysed and data collected using a proforma. Information collated included patient's age, gender, admission diagnosis, other significant diagnoses, presence of indicator conditions and any documented HIV-related risk factors. We recorded any documentation about HIV being within the differential diagnosis and we also recorded whether HIV testing was considered. The local laboratory computer system was then used to check the patient's full blood count to look for any unexplained blood dyscrasias. Using the microbiology laboratory system, any HIV tests performed during the course of a specified illness were noted. This was done 6 weeks after initial data collection to allow sufficient time for tests to take place. The data were then collated and analysed using Microsoft Excel.

Audit 2

A list of all HIV-positive patients, new to the HIV service at Monklands Hospital in 2010, was obtained from clinic records. From this list, individuals who had been diagnosed prior to 2010 and who had transferred to the service were excluded, leaving only those who had been newly diagnosed between 1 January 2010 and 31 December 2010. Information was gathered, using a proforma, regarding patient age, sex, clinical presentation at diagnosis, the clinical setting in which the test was performed, and the CD4 count and viral load at the point of diagnosis. Any risk factors for HIV infection were also noted.

Hospital medical notes for each patient were obtained from all three hospitals in the NHS Lanarkshire Board area. These were examined to identify all previous presentations documented within secondary care records within the Board area prior to the date of their HIV diagnosis. Encounters relating to the reason for their eventual test were excluded. Any clinical encounters were studied to see if an indicator condition for HIV testing was present at the time. Any such presentations were recorded with information on what the indicator condition was, the clinical setting and the length of time until eventual diagnosis. Any encounter that had led to a negative test being performed was excluded and only encounters following this were included. Presentations were classified as either Category 1 (potentially AIDS-defining conditions) or Category 2 (other conditions where HIV testing should be offered) as per the BHIVA guidelines. A correlation between CD4 and number of previous presentations with an indicator condition was determined using the Spearman's rank correlation coefficient.

RESULTS

Audit 1

The audit identified 174 current medical inpatients, of whom none were excluded. Table 1 shows the basic demographics of this population. A total of 63/174 (36.2%) had at least one indicator or potentially AIDS-defining condition present, 12/174 (6.9%) had two present, 5/174 (2.8%) had three or more present and 3/174 (1.7%) had what would have been a potentially

TABLE 1 Audit 1 patient demographics

Age (years)	Mean Standard deviation Range	61.7 17.7 18–92
Gender	Male Female	88 86
Admission specialty	General medicine Infectious diseases Renal Cardiology Gastroenterology Respiratory Endocrinology Haematology Dermatology	32 24 22 21 21 21 12 11 10
Admission diagnosis (top 10 most common presentations)	Community acquired pneumonia ACS/MI COPD AKI Alcohol withdrawal Anaemia Cellulitis AML Pulmonary emboli	20 11 10 6 6 5 5 4 4

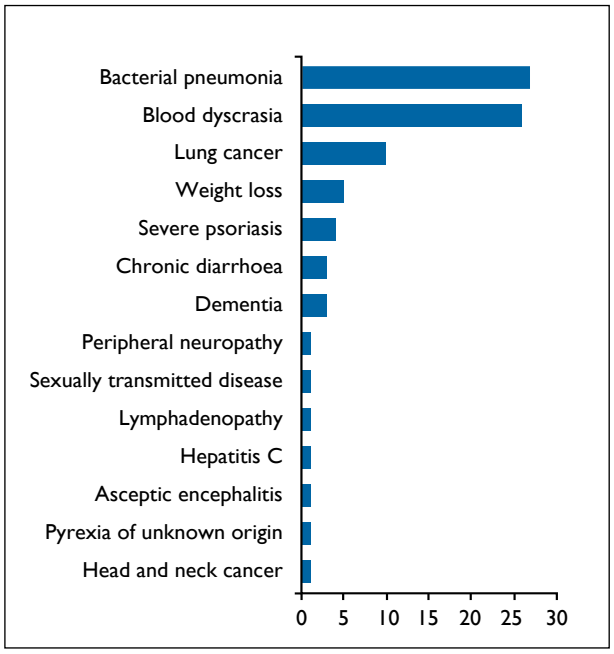

FIGURE 1 Indicator conditions identified

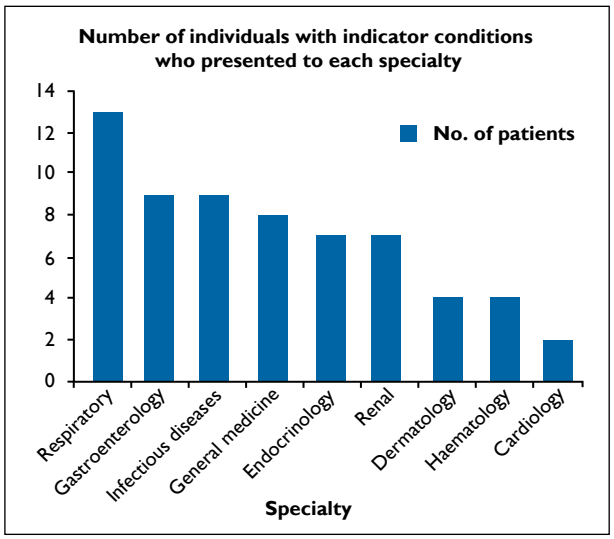

FIGURE 2 Number of patients with indicator conditions by specialty

AIDS-defining illness if they had gone on to have a positive HIV test. The most commonly identified indicator conditions are displayed in Figure 1; unexplained blood dyscrasias and bacterial pneumonia being the most common. The potentially AIDS-defining illnesses identified were one case of tuberculosis and two cases of non-Hodgkin lymphoma.

Twelve of the 174 sample group (6.9%) were tested for HIV, 7/63 (11.1%) patients with an indicator condition were tested and 0/3 of patients with a potentially AIDS-defining illness were tested. All tests performed were negative. These patients presented to a wide range of medical specialties as illustrated in Figure 2.

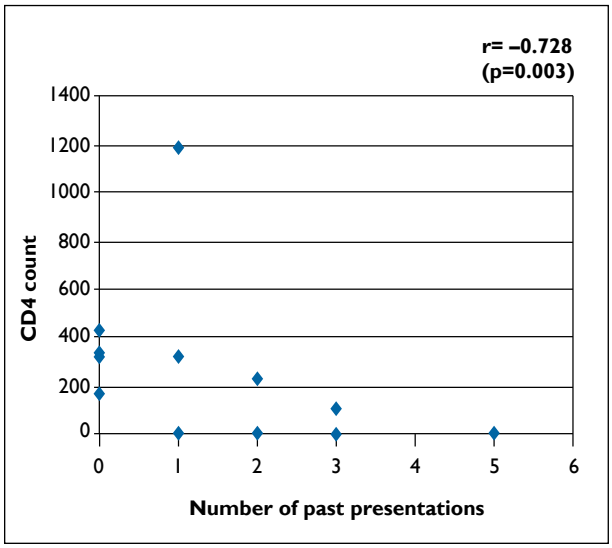

FIGURE 3 The negative trend between CD4 count at diagnosis and number of presentations with indicator conditions prior to diagnosis

Audit 2

Fourteen individuals met the inclusion criteria. Nine (64.3%) had previous presentations with indicator conditions where an opportunity for HIV testing had been missed. The number of missed testing opportunities for each patient ranged between 0 and 5.

Of the five patients who had seemingly been tested at the first opportunity, four were seen by the Infectious Diseases or Genitourinary services and the other was seen and tested by Dermatology. Two of these five patients had requested a test themselves, one immediately after the death of his partner from pneumocystis pneumonia and the other on experiencing seroconversion symptoms following high risk sexual contact on holiday. Of the other three who were tested on first presentation, one was seen at the Infectious Diseases clinic with diarrhoea and fever after high risk sexual contact in Thailand, one was seen at the Genitourinary clinic with genital ulceration and one was seen by Dermatology, presenting with oral ulcers and a skin rash. It was noted that none of the five who were diagnosed after first presentation had developed an AIDS-defining condition.

Three of the patients were eventually tested after presenting with an AIDS-defining illness (all three had pneumocystis pneumonia). These patients had presented between 1 and 3 times with indicator conditions in the lead up to the diagnosis over the previous 4–8 months. Four patients presented with CD4 counts in single figures, all of whom had previous missed opportunities for testing; two of them presented with an AIDS-defining condition at the time of a test finally being offered. One patient could potentially have had their HIV diagnosed 9 years earlier, eventually being diagnosed in Dermatology with severe refractory psoriasis.

The majority of missed prior presentations documented in secondary/tertiary care notes were in the General Practice setting. However, they also occurred across a wide range of specialties including Surgery and Psychiatry. Figure 3 shows an apparent negative trend whereby the greater the number of previous missed presentations, the lower the CD4 count at diagnosis.

The indicator conditions that did not lead to an HIV test being offered included chronic diarrhoea of unknown cause, weight loss of unknown cause, lymphadenopathy of unknown cause, unexplained leucopenia, severe/recalcitrant psoriasis, pyrexia of unknown origin, bacterial pneumonia, aseptic meningitis, oral candidiasis and dementia. This is comparative to the indicator conditions found in Audit 1 in medical inpatients (Figure 1).

DISCUSSION

Audit 1 showed that a significant number of medical inpatients had an indicator condition that should have prompted consideration of an HIV test; however only a small minority of these patients were actually tested. More concerning was the lack of HIV testing of people with a potentially AIDS-defining illness. This is in line with larger studies which have suggested that the 2008 testing guidelines are poorly adhered to in clinical practice.[8,9]

Audit 2 highlighted numerous missed previous opportunities for testing in newly diagnosed HIV patients, resulting in late diagnoses for the majority of patients. In one particular case the diagnosis could potentially have been made 9 years earlier.

Although the sample size is small, there still appears to be a negative trend between the number of previous missed opportunities for testing and CD4 count at diagnosis. This demonstrates the importance of not missing indicators for testing; the patients who had apparently been tested at the earliest opportunity had higher CD4 counts at diagnosis and did not have AIDS-defining conditions. The patients who had multiple missed opportunities for testing before diagnosis were more likely to have a lower CD4 count or an AIDS-defining condition at diagnosis, with associated poorer morbidity and mortality.

It is likely that we have underestimated missed presentations to GP surgeries. We have only assessed missed opportunities documented within secondary care notes because extending the audit to looking at primary care notes would have been logistically very difficult. The findings demonstrated by both audits indicate a need to educate non-specialist clinicians about the existence and importance of the national HIV testing guidelines. They should be encouraged not to leave the responsibility for HIV testing to their colleagues in Genitourinary Medicine and Infectious Diseases as was actively encouraged in the past. In addition, physicians, nurses and midwives should be aware that they are able to test for HIV without extensive patient counselling, as is the case for other chronic diseases such as type 2 diabetes.[6] In hospitals, this could be done through teaching at hospital educational meetings, through signposting to the national guidelines via hospital intranets and through modifying admission documents to prompt consideration of whether an HIV test is indicated or not. What the audits show is that most of these patients were presenting to their GPs before seeing a hospital doctor and it is therefore crucial to educate and support GPs. Other studies, however, have shown that adherence to the guidelines can remain poor even with more education regarding their content[8,9] suggesting other barriers to testing may be relevant.

One potential barrier to testing is the perceived inappropriateness of testing in certain populations, for example in elderly care. The prevalence of HIV in the ageing population is increasing due to highly active antiretroviral therapy, but the undiagnosed prevalence has also increased due to both progression of HIV acquired at a younger age and to newly acquired infection. The Centers for Disease Control and Prevention has shown that 24% of new diagnoses in the USA in 2011 were in those aged 50 years or over.[10] In addition, the percentage of late diagnoses and HIV-related mortality is significantly higher in those aged over 50.[1] An inability to identify a clear 'risk' for HIV is also a barrier to testing even though it has been shown that physicians find it difficult to illicit risk in a consultation.[11] Furthermore it may not be the index patient that is a 'risk taker', but his or her partner that exhibits risk factors.

Due to the ongoing stigma around HIV, or a lack of knowledge on HIV, some clinicians may find it difficult to raise the possibility of HIV testing with a patient. Studies in the US showed that the clinicians who were more likely to prescribe HIV testing were those who had recently graduated,[12] were in a particular medical specialty,[12] and were female, black and Hispanic clinicians.[13]

There are arguments for testing all patients on an opt-out basis in areas of high seroprevalence (Edinburgh and some parts of Glasgow now fall into these areas), as well as for producing automatic comments recommending testing on positive laboratory reports of certain indicator conditions, such as viral hepatitis or tuberculosis.[14,15] The cost-benefit ratio of such systems is proven in high prevalence areas but is a matter of debate in areas of lower population seroprevalence.[16]

Our audits demonstrate a clear case for better education of clinicians and for the normalisation of HIV testing, with the aim of diagnosing infection earlier. HIV can be

easily diagnosed with a simple blood test and there are now highly effective treatment options which greatly reduce morbidity and mortality and result in near normal life expectancy.[2] In Lanarkshire we have presented these findings at grand rounds in all three hospital sites as well as organising educational events with GP practices. A blood borne virus educational pack has been developed and distributed. An HIV testing protocol specific to Lanarkshire is being developed and is due to be published soon. There are also plans to try and meet with each medical specialty to discuss how HIV testing can be incorporated into existing protocols.

It is hoped that the findings of these audits will raise awareness of the national testing guidelines and encourage clinicians to consider HIV testing as routine whenever they encounter patients with indicator conditions.

REFERENCES

1 Aghaizu A, Brown AE, Nardone A et al. *HIV in the United Kingdom: 2013 Report.* London: Public Health England; 2013. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/326601/HIV_annual_report_2013.pdf (accessed 15/10/2014).

2 May M, Gompels M, Sabin C. Life expectancy of HIV-1-positive individuals approaches normal conditional on response to antiretroviral therapy: UK Collaborative HIV Cohort Study. *J Int AIDS Soc* 2012; 15: 18078. http://dx.doi.org/10.7448/IAS.15.6.18078

3 Brown AE, Kall MM, Smith RD et al. Auditing national HIV guidelines and policies: The United Kingdom CD4 Surveillance Scheme. *Open AIDS J* 2012; 6: 149–55. http://dx.doi.org/10.2174/1874613601206010149

4 Cohen MS, Chen YQ, McCauley M et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med* 2011; 365: 493–505. http://dx.doi.org/10.1056/NEJMoa1105243

5 Fox J, White PJ, Macdonald N et al. Reductions in HIV transmission risk behaviour following diagnosis of primary HIV infection: a cohort of high-risk men who have sex with men. *HIV Med* 2009; 10: 432–8. http://dx.doi.org/10.1111/j.1468-1293.2009.00708.x

6 British HIV Association, British Association of Sexual Health and HIV, British Infection Society. *UK National Guidelines for HIV Testing 2008*. London: BHIVA; 2008. http://www.bhiva.org/documents/Guidelines/Testing/GlinesHIVTest08.pdf (accessed 15/10/2014).

7 Palfreeman A, Fisher M and Ong E. *Testing for HIV. Concise guidance to good practice series*. London: Royal College of Physicians; 2009. https://www.rcplondon.ac.uk/sites/default/files/testing-for-hiv-concise-guideline.pdf (accessed 15/10/2014).

8 Page I, Phillips M, Flegg P, Palmer R. The impact of new national HIV testing guidelines at a district general hospital in an area of high seroprevalence. *J R Coll Physicians Edinb* 2011; 41: 9–12. http://dx.doi.org/10.4997/JRCPE.2011.103

9 Peck L, Ferenczi E, Burns F et al. Barriers to targeted HIV testing on an acute admissions unit: evaluation of the UK guideline. *QJM* 2010; 103:147–51. http://dx.doi.org/10.1093/qjmed/hcp185

10 Centers for Disease Control and Prevention. *HIV Surveillance Report, 2011; vol.23*. Atlanta, GA: CDC; 2013. http://www.cdc.gov/hiv/pdf/statistics_2011_HIV_Surveillance_Report_vol_23.pdf (accessed 16/10/2014).

11 Epstein RM, Morse DS, Frankel RM et al. Awkward moments in patient-physician communication about HIV risk. *Ann Intern Med* 1998; 128: 435–42.

12 Rank C, Remis RS, Swantee C et al. Patterns of HIV testing among Ontario physicians. *Can J Public Health* 2010; 101: 294–9.

13 Bernstein KT, Begier E, Burke R et al. HIV Screening among U.S physicians, 1999-2000. *AIDS Patient Care STDS* 2008; 22: 649–56. http://dx.doi.org/10.1089/apc.2007.0261

14 Perry N, Heald L, Cassell J et al. HIV testing in acute general admissions unit must be universally offered to reduce undiagnosed HIV. *HIV Med* 2010; 11 (suppl 1): 7. http://dx.doi.org/10.1111/j.1468-1293.2010.00841_1.x

15 Heijman RL et al. Opting out increases HIV testing in a large sexually transmitted infections outpatient clinic. *Sex Transm Infect* 2009; 85:249–55. http://dx.doi.org/10.1136/sti.2008.033258

16 Health Protection Agency. Evidence and Resources to commission expanded HIV Testing in Priority Medical Services in High Prevalence Areas. April 2012. http://boltonshealthmatters.org/sites/default/files/Evidence%20to%20commission%20expanded%20HIV%20testing.pdf (accessed 10/11/2014).