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Does general practice deliver safe primary care to people living with HIV?

A case-notes review

Abstract

Background
Safe care in general practice for people living with HIV requires early diagnosis of undetected infection and safe co-prescribing with antiretroviral therapy (ART).

Aim
To evaluate safe co-prescribing in general practice patients who are taking ART, and to describe missed diagnostic opportunities for undiagnosed HIV infection in primary care.

Design and setting
Retrospective case-notes review in general practices within NHS City and Hackney Primary Care Trust (PCT), London, UK.

Method
All general practices in NHS City and Hackney PCT were invited to participate. Patients known to be HIV positive were identified using Read Codes. Each practice undertook retrospective case-notes reviews on specialist correspondence, coding of ART, prescribing of common contraindicated drug pairings, and missed opportunities for HIV diagnosis.

Results
In total, 31/44 (70.5%) practices participated, and 1022 people living with HIV were identified. Practices had received HIV clinic letters for 698 of those 1022 (68.3%) patients in the previous 12 months. Of the 787 patients known to be prescribed ART, only 413 (52.5%) had correct drug codes recorded; 32/787 (4.1%) were receiving specified contraindicated drug pairings. In total, 89 patients were eligible for their case-notes to undergo a retrospective review of occurrences that took place pre-diagnosis. In the 2 years preceding diagnosis, these 89 had attended 716 face-to-face GP consultations, of which 123 (17.2%) were for indicator conditions. Fifty-one of these patients (57.3%) presented at least once with an indicator condition (interquartile range 1–3; median 2).

Conclusion
In a large-scale evaluation of GP records of people living with HIV, gaps in ART recording and co-prescribing were identified, and evidence demonstrated missed opportunities for diagnosis within general practice. Specialists and generalists must communicate better to enhance safe prescribing and reduce delayed diagnosis.

Keywords
delayed diagnosis; drug interactions; general practice; HIV; inappropriate prescribing.

INTRODUCTION

People living with HIV can now expect a near-normal life expectancy if they are diagnosed early and are able to access timely specialist care. This is reflected in a growing and ageing population of people living with HIV in the UK who are registered with general practices: around one-quarter of people living with HIV are now aged >50 years.[1] Longevity is leading to a population with a high risk of comorbidities and associated polypharmacy.[1]

This study aimed to look at the two key aspects of care — timely diagnosis and safe prescribing — provided to patients living with HIV. Timely diagnosis has been recognised as the initial key component in the HIV care continuum to reduce HIV-related illness and death, and prevent transmission of the virus.[2] The results of this review are of particular importance for those people living with HIV who are, as yet, unaware that they have the infection. Recent studies have shown that HIV testing is feasible and acceptable to patients, and the results from a trial of rapid HIV testing in primary care (RHIVA2) demonstrated that GPs can play an important role in increased and early diagnosis of HIV.[3–6]

Historically, care of people living with HIV in the UK has been provided almost exclusively by specialists, with little input from general practice.[7,8] There has often been debate as to what extent general practice should be involved in the delivery of the wider aspects of care for people living with HIV, and this has resurfaced recently due to HIV service reconfiguration.[9]

People living with HIV consult their GPs for an array of issues,[10–12] but there has been concern about the lack of awareness among GPs surrounding the complexities of care including complex drug–drug interactions between antiretroviral therapy (ART) and commonly-prescribed primary care medications.[13] According to the National Patient Safety Agency, approximately 23.7% of general practice incidents reported to the National Reporting and Learning System relate to medication[14] and medication errors are the second most-common cause for litigation claims in general practice.[15] Mechanisms should, therefore, be in place to enable safe co-prescribing by GPs to patients who have chronic disease including HIV. As a minimum, this should include good two-way communication regarding current therapy between specialist clinics and general practice (as highlighted in the British HIV Association's [BHIVA] Standards of Care),[8] and accurate recording by GPs of hospital prescribed ART.[16]

HIV continues to represent a significant public health issue in the UK. In 2013, an estimated 22% of people living with HIV were unaware of their infection, and approximately 42% of patients were diagnosed 'late'; that is, with a CD4 count of <350 cells/mm^3 (the current threshold for the commencement of

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How this fits in

An increasingly healthy ageing population with HIV is using GP services, while attending specialist centres only for HIV care reviews. Until now, the barriers to safe primary care in general practice for this population have not been quantified. This is the first borough-wide case-notes review of primary care in general practice for people living with HIV that assesses communication with secondary care, GP recording of antiretroviral medication, and unsafe general practice co-prescribing. Additionally, it includes a more detailed review of free-text case-notes, highlighting missed opportunities for earlier diagnosis. The authors believe this review constitutes a tool to promote safer care for people living with HIV that can be used in other areas of the UK including in areas with low prevalence of HIV.

ART).[1] Although a national audit performed in secondary care identified that the proportion of patients having been diagnosed in general practice has increased (4.8% in 2003 to 10.4% in 2010), the contribution of general practice to new diagnosis remains modest.[17] Of the 1112 patients included in that audit, 82% were registered with a GP and at least one-third of these had attended their GP before diagnosis.

More locally, a recent case-notes review performed in four general practices in the London borough of Tower Hamlets showed that 65% of people living with HIV had presented to their GP with an HIV indicator condition in the 3 years preceding diagnosis.[18] Indicator conditions are diseases that have been associated with underlying HIV infection, and should prompt consideration of an HIV test in line with national guidelines.[19–21]

Delays in HIV diagnosis have a significant effect on mortality: for patients diagnosed 'late', the risk of dying within the first year of diagnosis is increased tenfold compared with those diagnosed at CD4 count of ≥350 cells/mm^3.[22]

This evaluation was commissioned by the Department of Public Health, NHS City and Hackney Primary Care Trust (PCT). City of London and Hackney are two inner-London boroughs with a united public health department; the boroughs have a very high prevalence of diagnosed HIV (8.2 per 1000 patients known to be HIV positive).[1] In conjunction with other HIV-related interventions in these boroughs, this service evaluation was part of a GP targeted intervention to promote the safe delivery of primary care to people living with HIV.

METHOD

The review team consisted of two GPs and a local GP trainee working in public health. All 44 practices in NHS City and Hackney PCT were invited to take part in the evaluation. Participating practices received a fee of £200 to cover practice costs. Data were collected between November 2012 and March 2013. Patients registered at the time of the study aged ≥15 years and diagnosed with HIV were identified using electronic searches adapted from a previous study that used diagnostic HIV Read Codes and surrogate codes.[18]

Supported by a member of the survey team, a doctor from each participating practice performed two retrospective reviews of the electronic case-notes of the registered people living with HIV who had been identified. The two reviews were as follows:

- Review 1: prescribing safety. All records were reviewed to confirm HIV diagnosis. These were then examined for clinic letters from specialist centres (including letters stating patient non-attendance). The GP medication records were checked for coding of ART and the co-prescribing of specific contraindicated medications; these had been selected on discussion with HIV specialist pharmacists and an HIV clinician. In instances where ART was incorrectly coded, GPs were asked to update the records; where specific contraindicated drug–drug interactions were noted, GPs were advised to contact the patient and safer alternatives were suggested (Box 1). In some cases, GPs were advised to contact the specialist clinics for further information.
- Review 2: missed opportunities for

Box 1. Contraindicated drug–drug interactions and recommended[a] action

Drugs pairing searched	Danger associated	Recommended action
• Proton pump inhibitor with atazanavir or rilpivirine	• Significant reduction in AUC[b] of atazanavir and rilpivirine	• If acid suppression needed discuss with patient and specialist
• Simvastatin with boosted protease inhibitors	• Significantly increased blood concentration of simvastatin leading to toxicity: potential myopathy and rhabdomyolysis	• Preferential use of atorvastatin (<20 mg initially) with all ART
• Inhaled or intranasal mometasone/fluticasone/budesonide with boosted protease inhibitors	• Increased blood levels of steroid and associated risk of systemic glucocorticoid effects	• Discuss with patient and specialist to decide on how to safely switch to beclomethasone

[a]For any other drug–drug interaction, please check the Liverpool HIV drug database (http://www.hivdruginteractions.org) [b]This is a measure of bioavailability. ART = antiretroviral therapy. AUC = area under the curve.

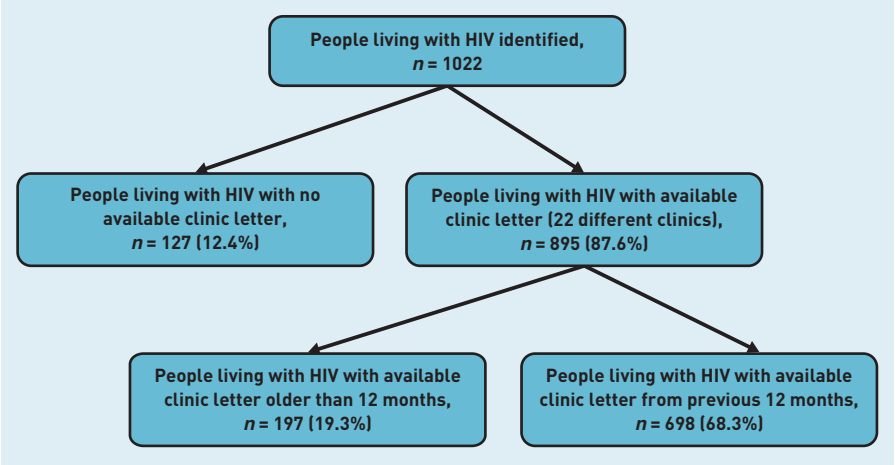


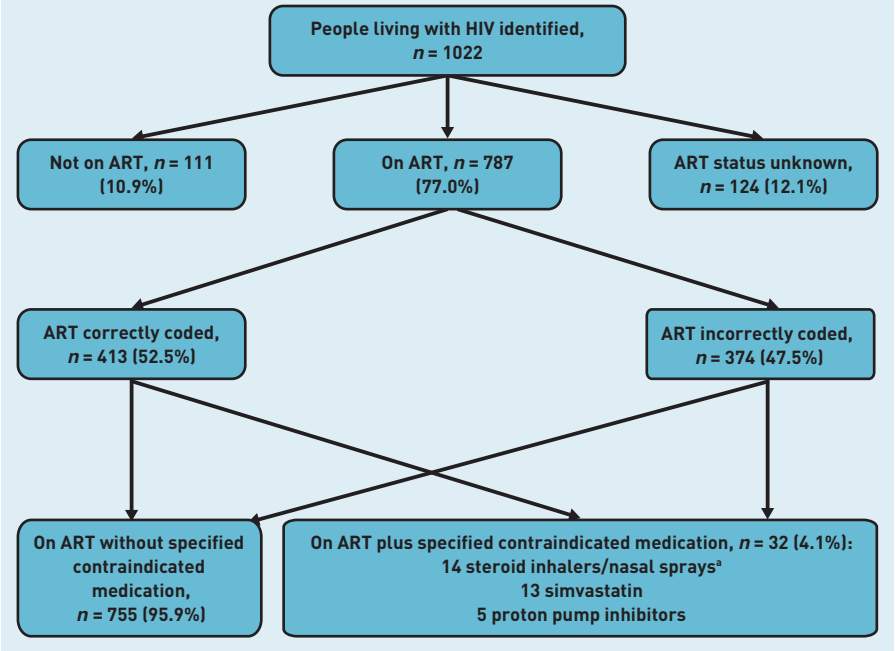
Figure 1. Availability of HIV specialist clinic letter.

diagnosis. From the patient population identified in Review 1 an electronic search was undertaken to find patients who had been diagnosed since October 2010. From the randomly generated computer list, patients were validated by case-notes review to confirm date of diagnosis and a minimum of 2 years pre-diagnosis registration at that surgery. In practices with fewer than five eligible patients, the search reference date was locally reset to October 2008 (that is, since the publication of the national guidelines for HIV testing[18]) to maximise the number of patients eligible for the review.

The participating doctor from that surgery recorded the dates and problem titles of all face-to-face GP consultations (including consultations in which HIV testing was discussed) in the 2 years preceding diagnosis. Consultations without specific problem titles were examined for free-text entries of indicator conditions. Relevant consultations and possible indicator conditions were discussed anonymously with a review team member who was available during the case-notes reviews. Documents regarding indicator conditions were also distributed to GPs to assist them. Pre-diagnosis blood dyscrasias including neutropenia and thrombocytopenia were actively searched for in blood test results midway through the evaluation, when it became clear this was a key variable.

GPs received feedback about their local surgery prevalence of disclosed HIV status compared with known national surveillance data, their surgery's summarised results, and the survey results across the two boroughs. They were encouraged to present these data to the rest of the clinical staff in a meeting for shared learning. Statistical analysis was performed using Microsoft Excel 2010.

Figure 2. ART documentation and co-prescription information.



[a]*These include medications such as mometasone, fluticasone, and budesonide. ART = antiretroviral therapy.*

RESULTS

In total, 31 of 44 surgeries (70.5%) agreed to take part; five (11.4%) practices did not respond, four (9.1%) were interested but subsequently declined, and another four (9.1%) refused participation.

Prescribing safety

Prevalence of disclosed HIV status. Across the 31 participating surgeries, 1288 patients were identified by the searches. Reviewing patient records, 1022 patients were confirmed HIV positive, but no evidence for HIV infection was found in the remaining 66 patients, probably due to an oversensitive search algorithm that included non-diagnostic codes. Of these 1022 patients, 954 were aged 15–59 years, indicating a prevalence of 6.2/1000 for this age group (95% confidence interval [CI] = 5.8 to 6.6 per 1000). This is lower than the national surveillance data for diagnosed HIV in City and Hackney of 8.2 per 1000 for 2013,[1] implying a disclosure rate to GPs of 76%.

Communication with secondary care. Documentation from an HIV specialist service was identified in 895 of 1022 (87.6%) patients, but only 698 (68.3%) had at least one clinic letter recorded from the previous 12 months (Figure 1).

Patients were receiving specialist care from a total of 22 different secondary care clinics, with 362 out of the 895 (40.4%) attending the HIV specialist service at the

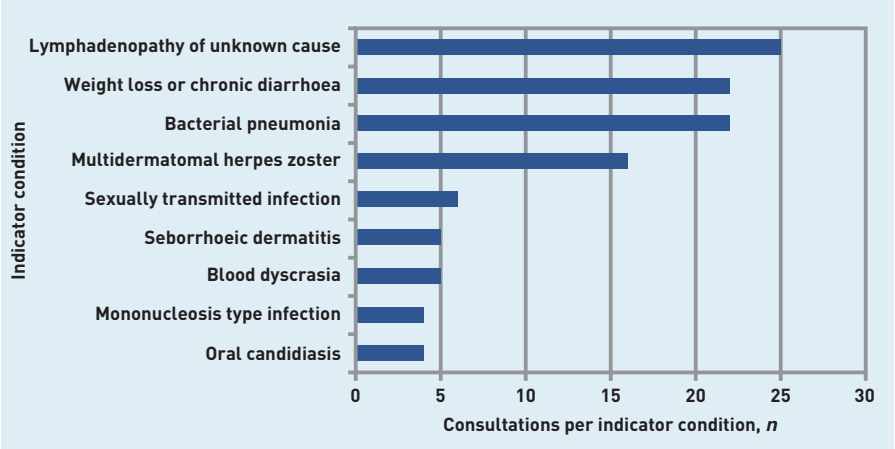


Figure 3. Indicator conditions with highest consultation rate in people living with HIV prior to diagnosis.

local hospital. There was considerable variation in communication from the different secondary care clinics; the local hospital was most effective at communicating (90.6% of its patients received clinic letters in the previous 12 months, versus 40.0% of patients of the least communicative clinic).

ART documentation. Even when the information was available, electronic documentation of ART was poor (Figure 2). Although 787 of 1022 (77.0%) patients were known to be on ART, either from specialist clinic letters or documented conversations with the patient, of these only 413 (52.5%) had their ART accurately coded in the electronic medication records. A total of 111 (10.9%) patients were clearly stated to not be on ART because they did not currently require therapy. For the remaining 124 (12.1%) patients, there was no record in either the clinic letters or notes to indicate whether they were on ART or otherwise.

Contraindicated co-prescriptions. In total, 32 of the 787 (4.1%) patients known to be prescribed ART were currently being prescribed specific contraindicated drug pairings for which the authors had searched (Figure 2). This included:

- 14 (1.8%) patients having a co-prescription of intranasal or inhaled mometasone/fluticasone/budesonide with a boosted protease inhibitor;
- 13 (1.7%) patients being on both simvastatin and antiretrovirals, of which two were with a boosted protease inhibitor; and
- five (0.6%) patients who were on a proton pump inhibitor and either atazanavir or rilpivirine.

Table 1. Clinical settings of HIV diagnosis

Clinical setting	NHS City and Hackney GP audit, *n* (%)	BHIVA National Audit 2010,[16] *n* (%)
GP	25 (28.1)	116 (10.3)
GUM and HIV clinic	29 (32.6)	615 (54.8)
Hospital/A&E	19 (21.3)	171 (15.2)
Outpatient	6 (6.7)	79 (7.0)
Antenatal clinic	3 (3.4)	51 (4.5)
Other	3 (3.4)	72 (6.4)
Unknown	4 (4.5)	8 (0.7)
Total	89 (100)	1122 (98.9)

A&E = accident and emergency. BHIVA = British HIV Association. GUM = genitourinary medicine.

Missed opportunity for diagnosis

In total, 89 patients were identified in the 31 surgeries as being suitable for the retrospective case-notes analysis. These 89 patients attended a total of 716 face-to-face consultations with a GP over the 2 years prior to receiving their HIV diagnosis (interquartile range [IQR] 4–29; median 7); 123 (17.2%) of these consultations were specifically for HIV indicator conditions (IQR 0–2; median 1).

Patients with indicator conditions

Of these 89 patients, 51 (57.3%) had presented to their GP with symptoms compatible with at least one indicator condition (IQR 1–3; median 2), but only 17 of these 51 patients (33.3%) were subsequently diagnosed with HIV by their GP. A total of 13 different indicator conditions (IQR 1-2; median 1) were recorded in face-to-face consultations with a GP. As shown in Figure 3, the most common indicator conditions were lymphadenopathy of unknown cause (25/123 consultations; 20.3% of all consultations for indicator conditions) recorded in 13 patients, followed by 22 consultations (17.9%) each for bacterial pneumonia (14 patients) and unexplained weight loss or chronic diarrhoea (10 patients).

Blood dyscrasia was recorded in problem titles in 4.1% of consultations. However, a preliminary review of laboratory data in some of the initial 21 practices audited suggested that blood dyscrasia was more common. In fact, a more detailed review in the remaining 11 practices indicated that 11 of 33 (33.3%) patients had a platelet count or low neutrophil count in the 2 years prior to diagnosis.

Clinical setting of HIV diagnosis. In total, 28.1% (*n* = 25) of the 89 patients were diagnosed in primary care, compared with 10.4% identified in the BHIVA's 2010 national audit (Table 1). These included patients who tested HIV-1 or HIV-2 antibody positive following a GP request for HIV testing. Patients whose clinical notes demonstrated a GP consideration of HIV testing, but who

were either referred to secondary care for diagnosis or subsequently diagnosed in a different setting, were excluded. When including these considerations, the numbers rise to 35 out of 89 (39.3%). It was not always clear, however, from the free-text notes whether these considerations had resulted in the offer of a test.

Late diagnosis. The CD4 counts at diagnosis were available for 60 patients; 34/60 (56.7%) were diagnosed 'late' with a CD4 count of <350 cells/mm^3. Eighteen of the 25 (72.0% patients diagnosed in general practice had CD4 counts available at diagnosis; 12 of these (66.7%) were diagnosed late with a CD4 count of <350 cells/mm^3, which compares with the national average of 42% late diagnosis.[17]

DISCUSSION

Summary

This study outlines the first service evaluation of key elements in the safety of primary care provision to people living with HIV and registered in general practice to be undertaken across a primary care trust. This study provides evidence of missed opportunities for diagnosis of HIV, gaps in ART prescribing in general practice, and lower than recommended standard of specialist communication with GPs.

The average percentage (68.3%) of specialist letters received by GPs in the 12 months prior to the study falls far short of the 95% standard set by BHIVA and despite the national Commissioning for Quality and Innovation targets for specialist HIV services.[8,16]

Due to the complexity of drug–drug interactions with ART, a GP's lack of information on specialist prescriptions may result in dangerous co-prescribing; however, the results of this study show that prescribing errors occurred even when a patient was known to be on ART. On the other hand, seasonality of many of the drugs prescribed in primary care (for example, intranasal steroids) may leave secondary care clinicians unaware of a patient's current medication.

Strengths and limitations

Although educational impact was not directly measured as part of this review, the researchers were impressed with the time commitment and enthusiasm from the participating GPs. The review took, on average, 1.5–3 hours in each surgery and often resulted in wide-ranging discussions regarding the cases and the complexities of managing people living with HIV. The authors believe that this review, in addition to other interventions in the area, will improve awareness of HIV testing guidelines and important drug–drug interactions.

The study protocol used enabled consistency and accuracy of data collection. However, GPs may have failed to record symptoms and diagnoses within the consultation notes and low secondary care communication rates may have, in part, resulted from administrative errors at the practices, such as lost clinic letters/letters not been scanned. Effective communication requires the mutual flow of patient information between primary and secondary care. As the rates of communication between primary care and secondary care clinics to chase up information were not examined in this review, a one-way information flow only was captured.

The researchers searched for a predetermined list of contraindicated prescriptions, but it is possible that some other contraindicated pairings may have been missed; a full drugs review on all people living with HIV was not possible within the remit of this review.

This review is not representative of the UK population, having been conducted in an inner-London setting where the prevalence of HIV is high. Although data were collected in 31 of 44 (70.5%) local surgeries, it is possible that there is some selection bias in those that volunteered to participate.

By necessity, the case-notes reviews were only performed on patients who had disclosed a positive HIV status to their GP. This may result in a positive skew on the proportion of patients who were diagnosed in primary care.

The low number of patients eligible for the review of missed diagnosis (n = 89), was due to the strict inclusion criteria, along with a high population turnover — measured by the magnitude of population flow into and out of an area — within one of the boroughs (Hackney [20–45% between 2007 and 2011]), which is likely to affect the number of patients registered with their GP for ≥2 years.[23]

All patient's primary care medication records were updated as a result of this review. One patient subsequently complained about their ART being stated on their paper prescriptions but was satisfied with this procedure following discussion with the HIV specialist pharmacist regarding its safety implications. This highlights the necessity for patient education regarding the importance of HIV status disclosure to general practice and the risk of drug–drug interactions, as well as health professionals' sensitivity around who is permitted to handle patients' confidential prescriptions.

Comparison with existing literature

The review on missed opportunities for diagnosis showed a much higher rate (28.1%) than the national average (10.3%) for the diagnosis of HIV in general practice, highlighting the important role GPs play in diagnosing the condition. This may be an effect of local interventions such as a recent cluster-randomised controlled trial of rapid HIV testing (RHIVA2) that demonstrated increased and early diagnosis of the disease as well as an established sexual health local enhanced service.[5]

The relatively large proportion of patients diagnosed late (67%) is also in line with RHIVA2 (55% in intervention practices and 73% control) which was completed just prior to this survey.[10–12,18] This may reflect GP's lack of awareness of HIV-related symptoms and national guidelines for testing in high risk groups, or perhaps a failure of patients to present in time.

The proportion of patients presenting with indicator conditions prior to diagnosis is comparable to a similar small-scale review previously performed in a neighbouring borough (57.3% versus 63%);[18] also it compares to findings of the BHIVA National Audit 2010 (39.6%)[17] and a review of The Health Improvement Network GP database (25.8%).

The high percentage of indicator conditions identified in the current study could be explained by the fact that the review was conducted in primary care rather than specialist clinics,[17] and looked at contemporary case-notes rather than retrospective data.[17,24]

The types of indicator conditions observed in this review correlate well with existing literature,[17,18,24] stressing the importance of focusing education and training on HIV-associated disease that is commonly seen in general practice. To the authors' knowledge, this study is the first large scale review of accuracy of GP ART recording and so data comparisons are not possible.

Implications for practice

This study has demonstrated that GPs are diagnosing more people with HIV than has previously been reported.[4,5,11,25] However, people living with HIV who have not been diagnosed with the condition attend general practice with symptoms suggestive of HIV, so further efforts are needed to remind GPs to implement national guidelines for testing to identify those who are unaware of their infection.[19–21]

The authors believe that this review is easily reproducible across any large-scale primary care setting irrespective of the local HIV prevalence and may serve to enhance awareness of HIV among practitioners and increase testing and diagnosis of the infection.

People living in multi-ethnic areas are less likely to attend sexual health clinics[26] so any GP attendance provides a potential opportunity for diagnosis, especially considering that one in every six GP consultations in the 2 years pre-diagnosis in the study cohort were for indicator conditions. However, this review of case-notes also highlighted some of the complex issues faced when diagnosing HIV. In one case a patient (who had eight face-to-face consultations with a GP with indicator conditions) was documented on three occasions as having refused an HIV test; they eventually went on to be diagnosed at a genitourinary clinic. The clinical implications of this are to highlight the complexities of issues, which the statistics may not represent. As a result, more detailed qualitative research looking at barriers and facilitators for HIV testing and diagnosis in primary care is needed.

Once diagnosed, people living with HIV are living for longer and with accumulating comorbidities.[1] GPs are increasingly being involved in the long-term care of patients and need to be aware of the dangers of inadequate medication coding and co-prescribing. This review provides an opportunity to update patient records to enhance prescribing safety, while also acting as a practice education intervention.

GPs should be aware of, and adhere to, the following recommendations when caring for people living with HIV:

- ART prescribed by secondary care should be coded in the GP records to help flag up interactions and reduce dangerous co-prescribing. ART recording in a format such as '0.1 Tablet' on 'Automatic' or 'Repeats' also reduces the chance of erroneous ART dispensing;
- to encourage the disclosure of HIV status, posters should be displayed in surgery waiting rooms reassuring patients of confidentiality and non-discrimination;
- consult resources such as the Liverpool HIV drug database (http://www.hiv-druginteractions.org), the local specialist pharmacist or the secondary care team for drug-related queries; and
- all GPs should familiarise themselves with the indicator conditions with which people with HIV commonly present to primary care.

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Ethical approval

No ethics approval was required.

Provenance

Freely submitted; externally peer reviewed.

Competing interests

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