An audit of laboratory testing among patients attending the HIV clinic in Beaumont Hospital

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Background:

Beaumont hospital serves a population of approximately 800 people living with HIV (PLWHIV). Stable patients are reviewed every six months, typically undergoing laboratory testing on each visit. The European AIDS Clinical Society (EACS) guidelines provide recommendations regarding intervals for blood testing (figure 1). We sought to establish compliance with European guidelines regarding serological, hematological and biochemical surveillance of PLWHIV.

Methods:

Patients who met criteria were selected out of all attendees over a four week period based on availability of charts. We collected data from January 2021 – December 2022. Those who first attended the clinic prior to January 2021, with regular attendance (at least annual attendance), and who had achieved virological suppression were included. Virological suppression was defined as a viral load <40copies/ml. Patients with less than one attendance per year were excluded. Data were obtained from medical charts and the hospital online blood results portal. Data regarding age, gender, medication, frequency of attendance, and frequency of blood testing (including viral load, CD4 count, FBC, renal/liver/bone profile, HbA1c, PSA and lipid profile) were collected. The statistical method used is descriptive data.

Diagnostic test	Frequency
HIV viral load	3-6 months
CD4 count	3-6 months (annual if stable on ART and CD4 >350cells/uL)
FBC	3-12 months
Lipids	Annual
Glucose (HbA1c if fasting glucose high)	Annual
LFTs	3-12 months
eGFR	3-12 months
Bone profile	6-12 months
PSA	1-2 years (among men >50yoa)

Figure 1 – EACS guidelines (1)

Results:

Patient characteristics	
Number of patients	80
Gender	37 female 43 male
Average age (range)	48.5 years (25-65 years)
Average no. of attendances over two year period	4.2 (range 3-8)
Number of patients with at least one detectable viral load	10 (12.5%)
Number of patients on integrase-inhibitor based regimen	61 (76%)

Among the 80 patients included there had been 337 patient encounters across the two-year period. A breakdown of tests performed each visit is listed below:

1. **Viral load** → carried out on 329/337 patient encounters (97.6%). 65/80 (81%) of patients met EACS guidelines for six-monthly testing. Of the ten who had detectable viral loads, two had recently initiated therapy, one had run out of medications, one reported poor compliance, and six had unexplained isolated detectable viral loads, or 'viral blips' (defined as a temporary, detectable increase in viral load after ART has effectively suppressed the virus to an undetectable level (2)).

2. **CD4 count** → measured during 311/337 patient encounters, despite 72/80 patients having at least two CD4 counts >350cells/uL. As these patients do not require CD4 testing more than once per year, this equated to 127 unnecessary CD4 tests among this cohort. Only one patient had CD4 count measured less frequently than EACS guidelines recommend.

3. **Full blood count** → FBC was tested on 98.5% of visits. Every patient met EACS guidelines for having at least one FBC per year.

4. **Renal/liver/bone profile** → Renal and liver profiles were tested on 97.5% of visits. Bone profile was tested on 91.7% of visits. Every patient met EACS

Lab test	Not tested	Once during two year period	Once per year	>1 per year
HbA1c	18 (22.5%)	30 (37.5%)	24 (30%)	8 (10%)
Lipids	15 (19%)	24 (30%)	25 (31%)	16 (20%)
PSA (men >50)	18 (85.7%)	1 (4.7%)	1 (4.7%)	0

Figure 2

Discussion:

The role for ongoing CD4 testing above a certain threshold in PLWHIV is debatable. It has been suggested that CD4 count measurement is of limited value, and that the CD4/CD8 ratio may be a more clinically relevant marker in predicting severe non-AIDS events (3). Others highlight the insignificance of CD4 counts in influencing clinical decision making, including one Australian study that reported potential annual savings of 1.4 million USD by reducing CD4 monitoring from biannual to annual testing (4). This equated to 67,700USD per 1000 PLWHIV per year. In Beaumont Hospital, the tests examined in this audit cost approximately €25 to process, in addition to fees for supplies, overheads and disposal. Through transitioning to yearly blood testing for stable patients, this could result in a cost reduction of approximately €20,000 per year.

Conclusion:

The majority of patients attending HIV clinic on a regular basis are virally suppressed. Viral load testing is performed at appropriate intervals in most, though CD4 counts, FBC, and renal/liver/bone profiles are often tested with unnecessary regularity. Glucose, lipid and PSA testing are not being done in accordance with EACS guidelines, though the appropriateness of annual screening in otherwise healthy individuals is open to debate. Furthermore, there is potential for cost-saving measures by educating healthcare providers regarding the recommended frequency of laboratory testing in patients with stable HIV.

References:

1. European AIDS Clinical Society Guidelines Version 11.1, Oct 2022
2. Clinical Info HIV.gov glossary (https://clinicalinfo.hiv.gov/en/glossary/blip)
3. Ron R et al. CD4/CD8 ratio during HIV treatment: time for routine monitoring? Ron R et al. Clinical Infectious Diseases. DOI: 10.1093/cid/ciad136
4. Chow EP et al. Routine CD4 cell count monitoring seldom contributes to clinical decision-making on antiretroviral therapy in virologically suppressed HIV-infected patients. HIV Med. 2015 Mar;16(3):196-200. doi: 10.1111/hiv.12198.

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