Early HIV Infection ; Demographic features and risk factors among individuals with early HIV infection in Ireland 2008-2011

Joanne Moran, Jeff Connell, Deirdre Burke, William Hall
National Virus Reference Laboratory, University College Dublin

Introduction

Recently acquired HIV infection may account for up to half all HIV transmissions. Identification provides an opportunity to target public health interventions and prevent further transmission. Although half to three quarters of early HIV infections may be symptomatic, many infections are unrecognised.

The number of acute HIV infections (incidence) has never been directly measured in Ireland. HIV incidence is a very sensitive indicator of the current state of the HIV epidemic and the impact of prevention programmes. Determining where HIV transmission is currently occurring provides important information on high risk population sub groups that prevention interventions should target.

The National Virus Reference Laboratory (NVRL) is responsible for testing all newly confirmed HIV diagnoses in Ireland and maintains a database of all such cases from 2001.

Objectives

1. To estimate HIV incidence and identify HIV transmission patterns in well defined risk group populations.
2. To determine the value of serology testing in the identification and surveillance of recent HIV infections.
3. To guide prevention activities by identifying those groups at highest risk of transmission.

Methods

Newly confirmed HIV infections from 2008 to 2011 (n=1404) were extracted from the NVRL HIV database. For each new HIV diagnosis, HIV INNO-LIA assay results and risk factor data were obtained from the NVRL laboratory information system (LIMs). Recent HIV infections were identified using the following criteria:

- Evidence of a HIV negative test in the previous 12 months.
- Detection of p24 antigen on first diagnosis.
- Application of the INNO-LIA HIV confirmatory assay banding pattern[1].

To determine recent HIV infection using the INNO-LIA line immunoassay test, three algorithms developed by Schupbach et al were selected (Table 1). These algorithms are derived from antibody reaction scores to the seven HIV antigen bands present on the INNO-LIA line assay strip (sgp120, gp41, p31, p24, p17, sgp105 and gp36) [1].

Algorithm Name	Algorithm Criteria for acute HIV infection
Algorithm 11	sgp120+gp41≤2.5
Algorithm 12	sgp120+gp41+p31≤4 OR sgp120+gp41+p31+p24+p17≤6.5 OR p31=0 AND p24≥2
Algorithm 13	sgp120+gp41≤4 AND p31=0

Table 1: INNO-LIA Western blot Immunoassay algorithms used to determine recent HIV infection

Results

- Early/recent HIV infection was identified in 17% (n=239) of the cohort.
- Risk factor data were available for 91% of recent HIV infections, of whom 61% (n=134) were men who have sex with men (MSM), 28% (n=62) were heterosexual and 10% (n=22) were injecting drug users (IDU) (Figure 1).
- The proportion of recent HIV infections attributed to MSMs increased steadily from 38% in 2008 to 69% in 2011 (Figure 2).
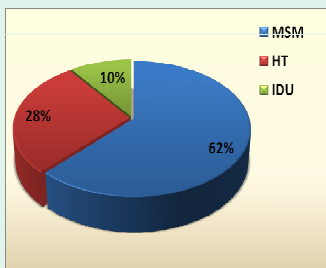
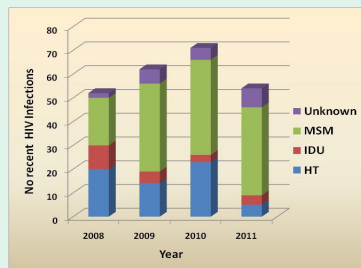**Figure 1**. Recent HIV infections by % risk group

Figure 2. Recent HIV infections by year and risk group

- 22% (n-52) had detectable p24 antigen suggestive of acute HIV seroconversion. Of these 71% (n=37) were MSM (Figure 3).
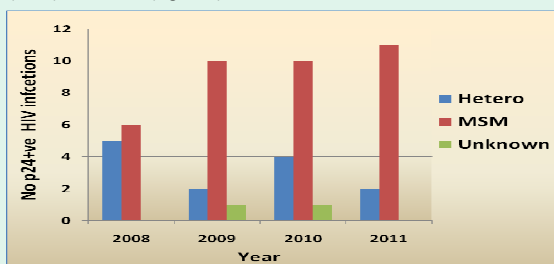
Figure 3. HIV p24 positive cases by year and risk group

- 94% (n=49) of all acute p24 cases were male. The median age in this sub population was 33 years. 71% (n=37) were aged between 25 and 44 years.

Results

- 83% (n=199) of recent HIV cases were male and 17% (n=40) were female. The median age at infection was slightly higher for males at 34 years compared to 31 years for females (Figure 4). 67% (n=133) of recently infected males were MSM.
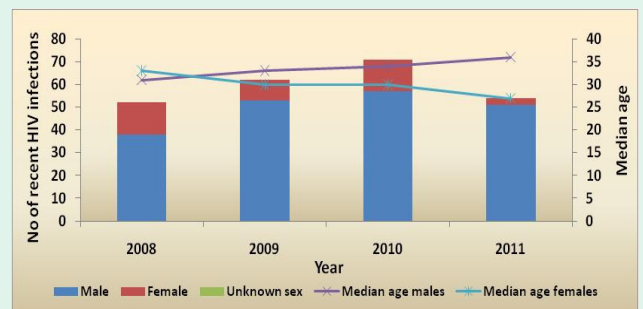
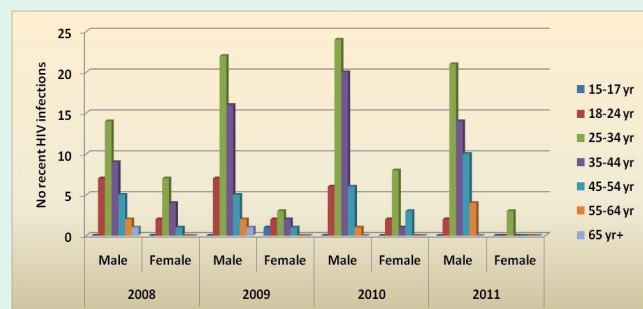**Figure 4**. Recent HIV infections by sex and median age.

Figure 5. Recent HIV infections by age group and sex

- 43% (n=102) and 28% (n=66) of recent HIV infections were diagnosed in 25 to 34 year olds and 35 to 44 year olds respectively (Figure 5).
- The number of males in 25-34 year old age group increased steadily from 2008 (n=14) to 2010 (n=24) with slight decline in 2011 (n=21).

Conclusions

This is the first study that estimates HIV incidence in Ireland. From 2008 to 2011, about one in six newly diagnosed HIV infections have been infected within the 12 months preceding first diagnosis. Data on transmission mode indicates that MSM is the predominant risk group for early HIV infection (61%). Similar trends have been reported in France and Germany where recently acquired infections in MSMs is also disproportionally high[2,3].

Irish MSM test more frequently for HIV than any other risk group population and are more likely to present early in the course of their illness. Many experts agree that diagnosis of HIV during the acute phase of infection, where appropriate treatment can be started early can have a positive outcome on the long term course of the infection. Early diagnosis and effective counselling can prevent onward HIV transmission. This study demonstrates that serological laboratory testing for detection of early infection can help target public health interventions.

References

1. Schupbach, J., Gebhardt, MD, Tomasik, Z. et al. (2007) Assessment of Recent HIV-1 Infection by a Line Immunoassay for HIV-1/2 Confirmation, *PloS Medicine*. 12: 1921-1929.
2. Semaille, C., Cazein, F, Lot, F. et al. (2009) Recently acquired HIV infection in men who have sex with men (MSM) in France 2003-2008, *Eurosurveillance*. 14(48):pii=19425.
3. Batzing-Feigenbaum, J., Loschen, S., Gohlke-Micknis, S. et al. (2009) Implications of and perspectives on HIV surveillance using a serological method to measure recent HIV-1 infections in newly diagnosed individuals: results from a pilot study in Berlin, Germany, in 2005-2007, *HIV Medicine*. 10:209-218.

We would like to acknowledge the help of the Health Protection Surveillance Centre (HPSC) in reviewing and providing helpful feedback on this study.