HIV infected young people in Australia: data from the Australian HIV Observational Database (AHOD)

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Scope of the Problem

- Adolescence (13-19 years) and young adulthood (20-24 years) are times of significant change
- CDC – 22% of 40000 new HIV infections in US[1]
- Aus - 2 % of all new HIV diagnoses were ≤19 years, with the majority (86.3%) of new diagnoses aged 13-19 years[2]
- Worldwide – 4 million adolescents living with HIV[3]
- Mortality increasing[3,4]
- Females disproportionately affected[5]

1. CDC, HIV Surveillance Report, 2015.
2. The Kirby Institute. HIV, viral hepatitis and sexually transmissible infections in Australia Annual Surveillance Report 2015.
3. Global report: UNAIDS report on the global AIDS epidemic 2013.
4.WHO 'Adolescent Health Epidemiology'.
5. UNAIDS Global AIDS Update 2016.

Previous Research in Adolescents and Young Adults

- Lower rates of viral suppression[6-8]

- Higher rates of loss to follow up (LTFU)[6-8]

- Delayed antiretroviral therapy (ART) initiation [9]

6. Ryscavage et al. JAIDS 2011 Oct 1;58(2):193-7
7. Dollfus et al. CID 2010 July 15, 2010;51(2):214-24.
8. Zanoni et al. AIDS patient care and STDs. 2014 Mar;28(3):128-35.
9. Lee et al. The Journal of adolescent health 2014; 55(3):358-65

Methods

- Australian HIV Observational Database (AHOD)
- <25 years at time of diagnosis compared with those ≥25
- Diagnosed after 1st Jan 1997
- Variables
  - Demographics
  - Comorbidities
  - Patient care setting
  - Mode of exposure
  - CD4 counts
  - Viral load
  - Treatment initiation/switch/interruption
  - LTFU

Statistics

- Pearson's x^2 test or Fisher's exact test for categorical variables

- Mann–Whitney U-test for comparison of metric variables

- Differences in rates were assessed by exact tests

- Cox proportional hazards models to evaluate factors associated with time to the first ART switch

- Multivariate linear regression models were used to analyse the mean CD4 cell count response after 12 and 24 months of ART

- Analyses were conducted using R Version 3.3.2 and SAS/STAT software

	Young cohort (<25 at diagnosis)	Older cohort (>25 at diagnosis)	p Value
Total patients	223	1961	
Gender			
male	175 (78.5%)	1747 (89.1%)	<.001*
female	47 (21.1%)	211 (10.8%)	
transgender	1 (0.5%)	3 (0.2%)	
Age at diagnosis (years)			
median (IQR)	22 (20-24)	37 (31-45)	-
Age at treatment initiation (years)			
n	196	1775	
median	24 (22-26)	40 (33-47)	-
Age at most recent visit/ DOD (years)			
median (IQR)	29 (25-34)	47 (40-55)	-

	Young cohort (<25 at diagnosis)	Older cohort (≥25 at diagnosis)	p Value
Patient care setting			
General practitioner	63 (28.3%)	587 (29.9%)	0.244
Hospital tertiary centre	39 (17.5%)	418 (21.3%)	
Sexual health clinic	121 (54.3%)	956 (48.8%)	
Country of birth			
Australia/New Zealand	99 (44.4%)	1013 (51.7%)	0.121
other	78 (35.0%)	593 (30.2%)	
missing	46 (20.6%)	355 (18.1%)	
Exposure category			
MSM	149 (66.8%)	1324 (67.5%)	0.129*
MSM/injecting drug use	1 (0.5%)	47 (2.4%)	
heterosexual	57 (25.6%)	444 (22.6%)	
injecting drug use	7 (3.1%)	39 (2.0%)	
other	4 (1.8%)	63 (3.2%)	
missing	5 (2.2%)	44 (2.2%)	

	Young cohort (age <25)	Older cohort (age ≥25)	P value
HIV viral load at diagnosis (copies/ml)			
n	150	1462	
median (IQR)	**32,881 (8,422-89,600)**	**56,511 (8,600-177,827)**	**0.006**
HIV viral load at treatment initiation (copies/ml)			
n	157	1496	
median (IQR)	**13,373 (399-72,200)**	**23,244 (399-105,980)**	**0.123**
HIV viral load at first ART switch (copies/ml)			
n	78	858	
undetectable (<50 copies/ml)	**48 (61.5%)**	**520 (60.6%)**	**0.872**
median (IQR)	**49 (37-900)**	**50 (39-400)**	**0.413**
HIV viral load recent (copies/ml)			
n	130	1279	
undetectable (<50 copies)	**119 (91.5%)**	**1201 (93.9%)**	**0.291**
median (IQR)	**20 (19-40)**	**20 (19-40)**	**0.486**

	Young cohort (age <25)	Older cohort (age ≥25)	P value
CD4 at diagnosis (cells/mm³)			
n	153	1464	
median (IQR)	**480 (322-648)**	**409 (210-610)**	**0.001**
CD4 at treatment initiation (cells/mm³)			
n	153	1467	
median (IQR)	**350 (250-515)**	**324 (190-500)**	**0.096**
CD4 at first ART switch (cells/mm³)			
n	74	853	
median (IQR)	**530 (340-696)**	**473 (300-670)**	**0.455**
CD4 nadir (cells/mm³)			
n	216	1904	
median (IQR)	**311 (229-422)**	**270 (152-400)**	**<.001**
CD4 recent (cells/mm³)			
n	134	1315	
median (IQR)	**700 (510-850)**	**689 (500-882)**	**0.990**

	Young cohort (age <25)	Older cohort (age ≥25)	P value
Total patients	223	1961	
Mortality			
deaths	2	64	
incidence rate per 100 PY	**0.24 (0.06-0.95)**	**0.60 (0.47-0.76)**	**0.176**
LTFU			
LTFU	74	503	
incidence rate per 100 PY	**8.80 (7.01-11.05)**	**4.68 (4.29-5.11)**	**<.001**
Treatment switch			
switches	157	1918	
incident rate per 100 PY	**14.02 (12.00-16.40)**	**14.14 (13.53-14.79)**	**0.927**
Treatment interruption			
interruptions	58	528	
incidence rate per 100 PY	**5.18 (4.01-6.70)**	**3.89 (3.58-4.24)**	**0.045**

Limitations

- Very few perinatally infected
- Recruited in adult settings
- Few deaths
- Selection bias

Summary

- Largest study to date of Australian adolescents and young adults infected with HIV
- Demographics similar between groups, except higher proportion of females in younger cohort
- Predominantly MSM, majority seen in sexual health clinics
- Higher CD4 count and lower VL at diagnosis, difference lost at time of treatment initiation
- Higher LTFU rate
- Higher rates of treatment interruption

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Disclosure

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3. Global report: UNAIDS report on the global AIDS epidemic 2013. Geneva, Joint United Nations Programme on HIV/AIDS, 2013. [03/11/2016]. Available from: http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2013/gr2013/UNAIDS_Global_Report_2013_en.pdf.

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Definitions

- LTFU as greater than 365 days between the last clinic visit and the censor date.
- ART switches were defined as:
  - Addition of at least one different antiretroviral class to the original ART regimen
  - Addition of two drugs of the same class
  - Removal of at least two drugs and concurrent addition of at least one drug of the same class.
- ART regimen duration and treatment interruptions needed to be at least 14 days to be considered for the analyses
- Selected the closest CD4 cell count or plasma HIV viral load to HIV diagnosis, ART initiation, and first ART switch within a window of three months prior and one month post.
- Similarly, CD4 cell count and plasma HIV viral load at 12 and 24 months after ART initiation were taken as the values closest within a window of ±3 months.