Kirby Institute

Disease and treatment outcomes among HIV-positive people who inject drugs in the Australian HIV Observational Database

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Background

- Injecting drug use (IDU) is one of the most frequent routes of HIV transmission globally [1]
- Among HIV population, people who inject drugs (PWID) have poorer response to treatment, higher rates of coinfection, increased risk of virological and immunological failure [2-3]
- In Australia, the Needle-syringe Program (NSP) has had great success in reducing the rate of transmission among PWID [4]

Objectives

- Investigate PWID within the Australian HIV population
- Compare disease and treatment outcomes between IDU and non-IDU population
  - All-cause mortality
  - Virological suppression
  - Virological failure after suppression
  - Regimen switch/interruption

Study population

- AHOD (**A**ustralian **H**IV **O**bservational **D**atabase) [5]
- Established in 1999
- Monitor patterns of ART uptake
- Monitor long-term outcomes – immunological, virological, AIDS and death

Inclusion criteria

- All AHOD participants that initiated cART after 1 Jan 1997
- Have relevant HIV exposure data, split by:
  - Injecting drug use (IDU) only
  - IDU and men who have sex with men (IDU+MSM)
  - Other

Petoumenos, K., et al., HIV Medicine (2002)

Methods

- Cox regression methods used to assess the time to
  - All-cause mortality (since cART initiation)
  - First virological suppression (first VL<400 since cART initiation)
  - Virological failure (first VL>1000 since first suppression)
  - First regimen switch/interruption (change of 2 agents of the same class or change of 1 agent of a new class or if patient experienced treatment interruption of >30 days)

- Covariates: mode of HIV exposure, site, age, sex, region of birth, smoking, HCV, HBV, year of ART start, CD4 (at initiation), Viral Load (at initiation)
- Covariates are selected using backward selection with criteria for retention p=0.05

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Baseline characteristics

	IDU	IDU+MSM	Other
	N=71	N=82	N=2575
Site			
General practitioner (GP)	16 (22.5)	8 (9.8)	918 (35.7)
Tertiary hospital (TH)	15 (21.1)	18 (22.0)	488 (18.9)
Sexual Health Clinic (SHC)	40 (56.3)	56 (68.3)	1169 (45.4)
Age			
<30	16 (22.5)	16 (19.5)	397 (15.4)
30-39	34 (47.9)	39 (47.6)	949 (36.9)
40-49	13 (18.3)	18 (22.1)	741 (28.8)
≥50	8 (11.3)	9 (11.0)	488 (18.9)
Sex			
Female	10 (14.1)	0 (0)	234 (9.1)
Male	61 (85.9)	82 (100)	2341 (90.9)
Region of birth			
Australia & NZ	44 (61.9)	44 (53.7)	1404 (54.5)
Asia	5 (7.1)	2 (2.4)	225 (8.7)
Other	8 (11.3)	5 (6.1)	411 (16.0)
Missing	14 (19.7)	31 (37.8)	535 (20.8)
Ever smoked			
No	2 (2.8)	3 (3.7)	408 (15.8)
Yes	15 (21.1)	18 (21.9)	516 (20.1)
Missing	54 (76.1)	61 (74.4)	1651 (64.1)

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Baseline characteristics (cont)

	IDU	IDU+MSM	Other
	N=71	N=82	N=2575
HCV Antibody			
Negative	26 (36.6)	36 (43.9)	2107 (81.8)
Positive	42 (59.2)	38 (46.3)	166 (6.5)
Missing	3 (4.2)	8 (9.8)	302 (11.7)
HBV Surface Antigen			
Negative	64 (90.1)	61 (74.4)	2002 (77.7)
Positive	2 (2.8)	7 (8.5)	95 (3.7)
Missing	5 (7.1)	14 (17.1)	478 (18.6)
Year of ART initiation			
1997-2007	47 (66.2)	56 (68.3)	1493 (58.0)
>2007	24 (33.8)	26 (31.7)	1082 (42.0)
CD4			
<200	21 (29.58)	22 (26.83)	542 (21.05)
200-500	18 (25.35)	27 (32.93)	1095 (42.52)
>500	11 (15.49)	16 (19.51)	472 (18.33)
Missing	21 (29.58)	17 (20.73)	466 (18.1)
Viral Load			
<400	6 (8.45)	6 (7.32)	291 (11.3)
≥400	45 (63.38)	59 (71.95)	1783 (69.24)
Missing	20 (28.17)	17 (20.73)	501 (19.46)

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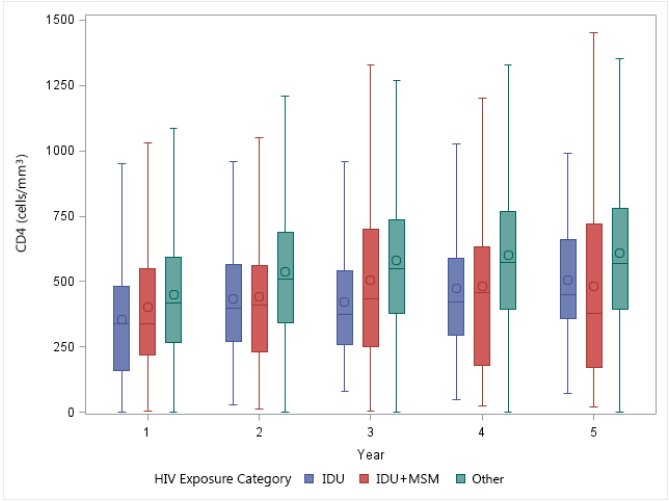
CD4 response to cART



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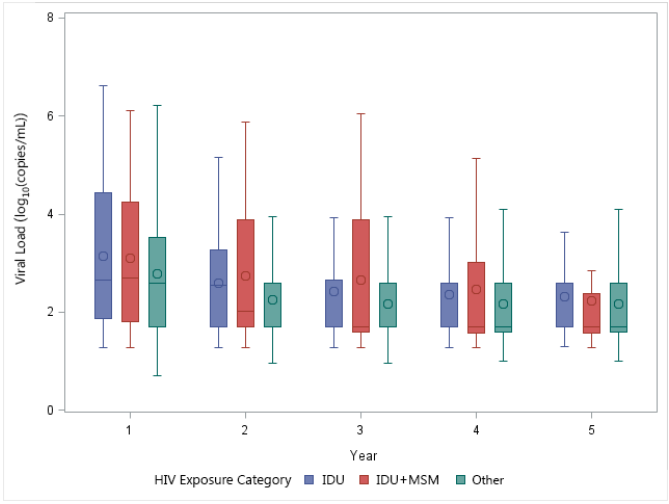
Viral Load response to cART



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Lost to follow-up & mortality

	IDU	IDU+MSM	Other	P
	N=71	N=82	N=2575	
Complete follow-up				
N (%)	31 (43.7)	25 (30.5)	1574 (61.1)	
Lost to follow-up				
N (%)	33 (46.5)	47 (57.3)	878 (34.1)	<.001
Per 100 person years (95% CI)	6.7 (4.8-9.4)	9.1 (6.8-12.1)	4.9 (4.6-5.2)	
Mortality				
N (%)	7 (9.9)	10 (12.2)	123 (4.8)	<.001
Per 100 person years (95% CI)	1.1 (0.6-2.1)	1.7 (0.9-2.9)	0.6 (0.5-0.7)	

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Time to Viral Suppression

Predictor	Viral Suppression No	Yes	Multivariate Hazard (95% CI)	p	p (Overall)
	N=54	N=1833			
Exposure					
Others	47	1736	1		
IDU	1	44	0.77 (0.56-1.05)	0.101	0.042
IDU+MSM	6	53	0.74 (0.56-0.99)	0.039	
Site					
GP	19	604	1		
TH	4	427	1.40 (1.23-1.58)	<0.001	<0.001
SHC	31	802	1.06 (0.95-1.18)	0.317	
Region of Birth					
Aus+NZ	28	1059	1		
Asia	2	162	1.21 (1.02-1.44)	0.027	0.028
Other	8	261	0.9 (0.78-1.03)	0.136	
Missing	16	351	1.04 (0.92-1.18)	0.535	
HCV					
No	36	1487	1		
Yes	5	169	1.1 (0.93-1.3)	0.282	0.058
Missing	13	177	0.85 (0.72-1)	0.046	
ART Start					
1997-2007	30	1103	0.58 (0.53-0.65)	<0.001	
>2007	24	730	1		

Other covariates analysed: site, sex, smoking, HBV, CD4

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Time to Virological Failure

Predictor	Virological Failure No	Yes	Multivariate Hazard (95% CI)	p	p (Overall)
	N=1211	N=622			
Exposure					
Others	1161	575	1		
IDU	23	21	1.51 (0.97-2.34)	0.067	0.023
IDU+MSM	27	26	1.54 (1.04-2.29)	0.033	
Age					
<30	183	120	1		
30-39	424	272	0.85 (0.69-1.06)	0.144	<0.001
40-49	375	140	0.57 (0.45-0.73)	<0.001	
≥50	229	90	0.64 (0.49-0.85)	0.002	
Ever Smoked					
No	222	65	1		
Yes	226	125	1.54 (1.14-2.08)	0.005	0.003
Missing	763	432	1.59 (1.22-2.06)	0.001	
CD4					
<200	315	184	0.59 (0.48-0.73)	<0.001	<0.001
200-500	686	268	0.54 (0.44-0.66)	<0.001	
>500	171	152	1		
Missing	39	18	0.54 (0.33-0.88)	0.013	

Other covariates analysed : site, sex, region of birth, HCV, HBV

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Discussion

- IDU+MSM required a longer time to achieve virological suppression
- IDU+MSM have a higher risk of virological failure
- IDU showed similar but non-significant trends
- IDU and IDU+MSM have a higher LTFU rate

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Limitations

- Lack of data on the duration of injecting drug use
- Mode of HIV exposure was used as a surrogate

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Conclusion

- Significant differences between PWID and non-PWID
- Consideration of new treatment guidelines for PWID
- New strategies to maximise compliance
  - Opt for more tolerable and convenient cART for starting regimen
  - Consideration of interactions with recreational/injecting drugs

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