HIV incidence and predictors of incident HIV among men who have sex with men attending a sexual health clinic in Melbourne, Australia

Cheung KT[1,2], Fairley CK[1,3], Read TRH[1,3], Denham I[1], Fehler G[3,4], Bradshaw CS[1,3], Chen MY[1,3], Chow EPF[1,3]

[1]Melbourne Sexual Health Centre, Alfred Health, Melbourne, VIC, Australia; [2]Melbourne Medical School, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, Melbourne, VIC, Australia; [3]Central Clinical School, Faculty of Medicine, Nursing and Health Sciences, Monash University, Melbourne, VIC, Australia

BACKGROUND

- Pre-exposure prophylaxis for HIV (PrEP) is expensive but it becomes more cost-effective when offered to populations with a higher incidence of HIV infection, particularly when the annual HIV incidence is above 2%. [1]

- Using risk factors to identify subgroups of men who have sex with men (MSM) with a higher incidence of HIV will allow PrEP to be used in a cost-effective way.

- Existing literature often focuses on risk factors that were reported by infected individuals at or after their HIV diagnosis with potential reporting bias. Risk factors reported by individuals may have been different at the time of the last negative HIV test, when an intervention such as PrEP may have been possible.

AIMS

- To determine the risk factors for HIV infection at the time of the last negative HIV test in MSM attending a sexual health centre.

- To identify subgroups of MSM in which preventive interventions such as PrEP would be considered cost-effective.

METHODS

- A retrospective study of MSM attending Melbourne Sexual Health Centre (MSHC) from 1-January-2007 to 31-December-2013.

- Only individuals who with at least two HIV tests within 12 months during the study period were included. MSM who tested positive for HIV on their first visit at MSHC or were known to have HIV at their first consultation were excluded.

ANALYSIS

- For each individual, period(s) of observation was calculated from an initial HIV negative test to the next negative or positive test within a 12-month period.

- The HIV incidence rate was calculated as the total number of new HIV diagnoses divided by the total person-years-at-risk.

- For risk factors associated with an HIV incidence of 2% or more, we calculated the proportion of individuals with the identified risk factors

- The prevalence ratio was calculated by comparing proportion of consultations with risk factors among HIV-positive MSM with proportion of all consultations.

- Rate ratios were computed as the ratio of the incidence rate in the category of interest divided by the rate in the referent category for each risk factor, and the 95% confidence intervals of incidence rate (IR) and risk ratio (RR) were calculated based on exact Poisson methods.
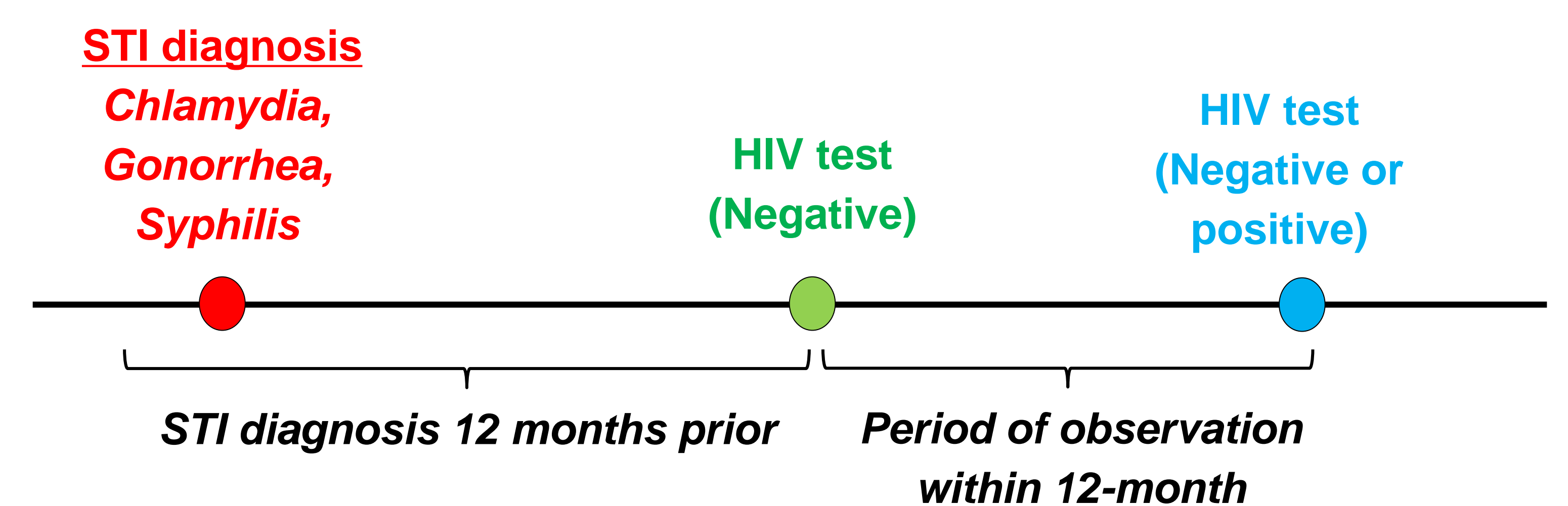
RESULTS

- There were 13907 individuals MSM who attended MSHC over the seven year period, during which 310 were diagnosed with HIV. A total of 5256 of them had at least two HIV tests done within a 12 month period and were HIV negative on the first test.

- Among these 5256 MSM, 49283 consultations were made, with a total number of 1465 gonorrhea, 1885 chlamydia, and 394 syphilis diagnoses.

- 81 HIV cases were diagnosed among these 5256 MSM within 12 months of an initial negative HIV test, yielding an HIV incidence of 1.3/100 person-year (95% CI: 1.0-1.6).

Risk Ratios

- The diagnosis of rectal gonorrhea had the strongest association with subsequent HIV acquisition compared to other STIs.

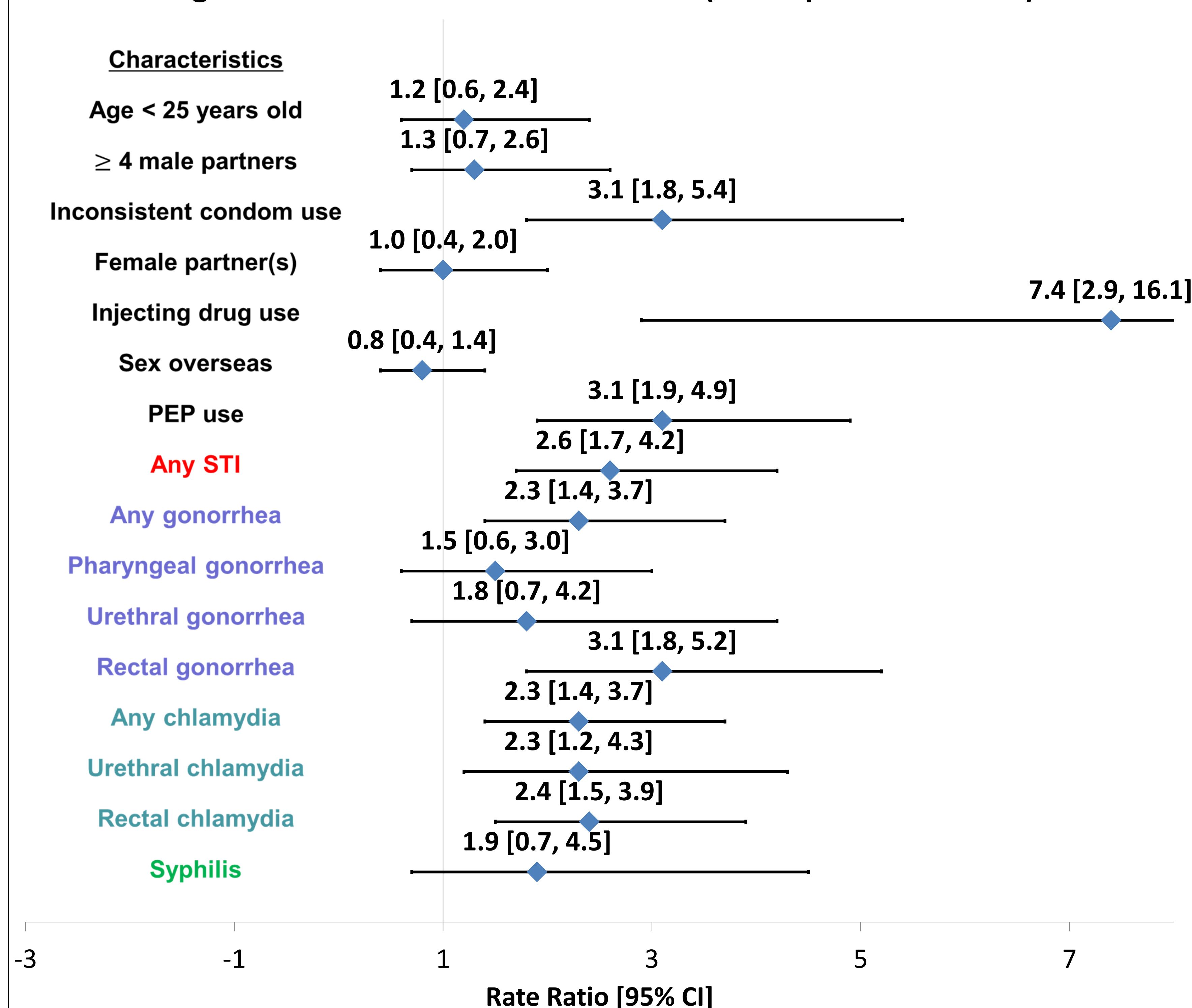- The diagnosis of rectal chlamydia increased the risk of HIV infection more than 2-fold.

Figure 1. Risk ratios of characteristics (in the past 12 months)

- MSM with gonorrhea and chlamydia at any sites were 2.3 (95% CI: 1.4-3.7) and 2.3 (95% CI: 1.4-3.7).

- Inconsistent condom use with anal sex (RR: 3.1 95% CI: 1.8-5.4) and injecting drug use (RR: 7.4 95% CI: 2.9-16.1) in the last 12 months were all associated with the diagnosis of incident HIV in the subsequent 12 months.

HIV Incidence Rate, Proportion and Prevalence Ratio

Presence of risk factors (last 12 months)	Proportion of those seen at initial consultation with characteristic	HIV incidence rate per 100 py [95% CI]	Prevalence Ratio
Inconsistent condom use with anal sex	52%	2.1 [1.6, 2.7]	1.4
Injecting drug use	1.7%	8.5 [3.4, 17.5]	6.0
PEP use	37%	2.3 [1.7, 3.1]	1.1
Having any STI diagnosis	34%	2.2 [1.6, 3.0]	1.6
Rectal Infections	26%	2.8 [2.0, 3.9]	1.9
Non-rectal infections	20%	2.2 [1.5, 3.3]	1.6
Gonorrhea at any site	20%	2.4 [1.6, 3.5]	1.7
Chlamydia at any site	25%	2.3 [1.6, 3.3]	1.6
Inconsistent condom use AND rectal infections	15%	4.1 [2.8, 5.8]	2.7
Any 1 risk factor	77%	1.7 [1.3, 2.1]	1.2
Any 2 risk factors	44%	2.1 [1.6, 2.8]	1.4
Any 3 risk factors	10%	3.4 [1.9, 5.5]	2.2
Any 4 risk factors	0.4%	6.2 [0.2, 34.4]	3.7

- Four risk factors (in the past 12 months) were associated with an HIV incidence of 2% or more:

  ➢ Inconsistent condom use with anal sex (52% of consultations, HIV IR: 2.1 [1.6, 2.7]);

  ➢ injecting drug use (1.7% of consultations, HIV IR: 8.5 [3.4, 17.5]);

  ➢ post exposure prophylaxis (PEP) use (37% of consultations, HIV IR: 2.3 [1.7, 3.1]); and

  ➢ having any STI diagnosis (34% of consultations, HIV IR: 2.2 [1.6, 3.0]).

- The proportions of consultations with any one, two, three, or four of these risk factors were 77% (HIV IR: 1.7 [1.3,2.1]), 44% (HIV IR: 2.1 [1.6,2.8]), 10% (HIV IR: 3.4 [1.9,5.5]) and 0.4% (HIV IR: 6.2 [0.2, 34.4]).

CONCLUSION

- Identifying key risk factors for HIV infection enables better direction of prevention efforts at both the individual and population level.

- MSM with bacterial STI and those reporting inconsistent condom use, injecting drug use, or PEP use are important targets for HIV prevention because they have the highest incidence and these are relatively common risk factors.

CONTACT INFORMATION

Dr Eric Chow, PhD
Melbourne Sexual Health Centre, Alfred Health
580 Swanston Street, Carlton, VIC 3053
Phone: +61 (3) 9341-6233   Email: echow@mshc.org.au

REFERENCE

1. Juusola, J.L., et al., *The cost-effectiveness of preexposure prophylaxis for HIV prevention in the United States in men who have sex with men.* Ann Intern Med, 2012. 156(8): p. 541-50.

Melbourne Sexual Health Centre
A part of Alfred Health

Monash University