P16 - HIV epidemiology

| P16.01 | AN AGENT-BASED MODEL TO SIMULATE AND PREDICT HIV EPIDEMIC IN BALTIMORE CITY, MARYLAND, USA |

[1]J Adleberg, [1]R Rothman, [2]C Flynn, [3]C Nganga-Good, [1]Y-H Hsieh*. [1]*Department of Emergency Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA*; [2]*Maryland Department of Health and Mental Hygiene, Baltimore, Maryland, USA*; [3]*Baltimore City Health Department, Baltimore, Maryland, USA*

Introduction Baltimore City has one of the highest HIV incidences and prevalences in the United States. An HIV testing program, implemented in several emergency departments (EDs), has accounted for 11% of newly diagnosed HIV cases from 2008–2013. We derive an agent-based model (ABM) for HIV transmission in Baltimore City, and use this to determine the significance of ED-based HIV testing on HIV transmission.

Methods An agent-based computational simulation was performed via the Python programming language, using 523,113 agents to represent the 13+ population of Baltimore City. The simulation was calibrated using HIV prevalence and incidence data culled from 2007 to 2013 City surveillance data. During each timestep, agents interacted with other agents. Agents were assigned one of three categories: seronegative, seropositive aware, or seropositive unaware, and individual risks were assigned from these categories, with seropositive unaware agents being 3.5 times more likely to transmit the disease. ED testing changed unaware agents to aware, and rates of testing were varied in order to study the effects on overall incidence. A subsequent sensitivity analysis was performed using different ranges of parameters, and a range of incidence projections was calculated.

Results Baltimore City HIV incidence decreased from 1,052 new cases (0.207%) in 2007 to 356 (0.068%) in 2013. Our model was able to approximate HIV incidence over time as observed from 2007 to 2013. Overall HIV incidence is forecast to decrease from 0.068% in 2013 to 0.042% in 2020 (95% CI: 0.015–0.079). It is further demonstrated that doubling capacity of the ED-based testing programs would likely avert 35 additional HIV transmissions from 2014 to 2020.

Conclusion We conclude that ABM provides an effective means of describing an epidemic with a highly heterogeneous population, and additionally that the ED-based testing program has had a significant impact on curtailing HIV transmission in Baltimore City.

| P16.02 | PREDICTORS OF HIV ACQUISITION WITHIN 12 MONTHS OF AN HIV NEGATIVE TEST IN MEN WHO HAVE SEX WITH MEN |

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

Introduction Studies of risk factors for HIV infection usually ascertain these at the time of diagnosis, when they are subject to multiple biases. This study aimed to identify factors present at the time of the last negative HIV test that could predict the risk of HIV acquisition within the next 12 months among men who have sex with men (MSM) attending a sexual health service in Australia. This may allow prioritisation of MSM for preventive interventions, which are becoming increasingly expensive.

Methods We conducted a retrospective cohort study of MSM attending Melbourne Sexual Health Centre between 1 January 2007 and 31 December 2013 with at least two HIV tests within 12 months. Age, sexual behaviour, and bacterial STI diagnoses were extracted from the date of the last negative HIV test and HIV incidence rate ratios (RR) were calculated for each risk factor. Risk factor prevalence was compared among all MSM and those subsequently infected.

Results Of 14745 MSM, 5262 were eligible, contributing 6525 person-years follow-up. 85 new HIV diagnoses were identified within 12 months of a HIV negative test with an incidence of 1.3 (95% CI: 1.0–1.6) per 100 person-years. Significant associations with subsequent HIV infection were: gonorrhoea at any site (RR: 4.1, 95% CI: 2.3–7.0), chlamydia RR: 3.9 (2.3–6.3), inconsistent condom use RR 2.7 (1.6–4.5), and injecting drugs RR 4.1 (1.7–8.6). Risk factor prevalences in tested MSM compared to those subsequently infected were: any bacterial STI (26% vs. 42%), inconsistent condom use (49% vs. 73%), any significant risk factors (60% vs. 83%).

Conclusion This analysis of a large clinic cohort identified significant predictors of subsequent HIV infection that were present at the last negative HIV test, when preventive intervention would still be possible. These could be used to prioritise MSM for potentially costly interventions.

| P16.03 | COMPARISON OF SEXUAL RISK BEHAVIOURS AMONG HIV POSITIVE MEN WHO HAVE SEX WITH MEN BEFORE AND AFTER THEIR DIAGNOSIS |

[1]Gino M Calvo, [2,3]Kelika A Konda, [2]Segundo R León, [2]Silver Vargas, [1]Hugo Sánchez, [4]Hector J Salvatierra, [5]Brandon Brown, [3]Jeffrey D Klausner, [2]Carlos F Caceres. [1]*Epicentro, Lima, Peru*; [2]*Unit of Health, Sexuality and Human Development, and Laboratory of Sexual Health, Universidad Peruana Cayetano Heredia, Lima, Peru*; [3]*University of California, Los Angeles, CA, USA*; [4]*Alberto Barton Health Center, Health Directorate of Callao, Lima, Peru*; [5]*Program in Public Health, University of California, Irvine, CA, USA*

Introduction Low HIV serostatus awareness and delayed treatment initiation among people living with HIV (PLHIV) contribute to HIV sexual transmission. An unacceptably low proportion of PLHIV are aware of their HIV status in Latin America. Improved understanding of sexual risk among PLHIV could help guide HIV prevention strategies.

Methods A cohort of 401 men who have sex with men (MSM) and transgender women at high risk were enrolled and assessed every three months for condomless sex and sexually transmitted infections (i.e. syphilis, HIV and anal chlamydia, and anal gonorrhoea). Among those who were positive at entry, we compared condomless sex and anal chlamydia/gonorrhoea according to prior knowledge of HIV serostatus; among those who seroconverted during follow-up, we compared condomless sex and anal chlamydia/gonorrhoea before vs. after HIV diagnosis, using McNemar's Chi-square test.

Results At baseline, 82 (20.5%) participants self-identified as HIV positive and an additional 42 (10.5%) were diagnosed with HIV. Among the 42 unknown HIV positives, 71% reported recent condomless receptive anal sex compared to 55% of known HIV positives (p-value = 0.078). No difference was observed in condomless insertive anal sex; 48% in each group. Among the 24 sero-converters during follow-up, 79% reported condomless receptive anal sex prior to their diagnosis and 32% after their diagnosis (59% decline, p-value = 0.001); 46% reported condomless insertive anal sex prior to their diagnosis and 14% after diagnosis (70% decline, p-value = 0.011). Anal gonorrhoea and/or chlamydia were diagnosed among 46% prior and 27% after diagnosis among the observed sero-converters (41% decline, p-value = 0.096).

Conclusions Risk behaviours and concurrent STIs diminish after a new diagnosis, following the patterns previously reported elsewhere. Current prevention efforts for PLHIV are insufficient and must take into account motivations for sexual risk taking, encourage people to reach viral suppression, and improve available prevention strategies to prevent onward transmission of HIV.

Disclosure of interest statement None.

P16.04 CLINICO-EPIDEMIOLOGICAL PROFILE OF ELDERLY HIV PATIENTS ATTENDING ANTI RETRO-VIRAL THERAPY (ART) CENTRE OF A TEACHING HOSPITAL IN SOUTH INDIA

D Madi*, N Ramakrishnan, J Ramapuram. Department of Medicine, KMC Mangalore (Manipal University)

Introduction Human Immunodeficiency Virus (HIV) infection was previously thought as a disease of the young. Clinicians are now encountering increasing numbers of older HIV patients in routine practice. Management elderly HIV can be challenging as they may present with advanced disease and they may also have multiple co-morbidities. There is a dearth of research in this field from India. The aim of our study was to determine the clinico-epidemiological profile of elderly ART naïve HIV patients attending a tertiary care institution.

Methodology This cross-sectional study was done in the ART centre attached to a tertiary care hospital of Southern India. Data of 120 patients who were diagnosed to be HIV-positive at or after age of 50 years (elderly HIV) from 2009 to 2014 was analysed after approval from the ethics committee. Sociodemographic and clinical characteristics were described using descriptive statistics.

Results Among 786 HIV patients detected from 2009 to 2014, 120 (15.27%) were elderly HIV. Majority of them 82 (68.33%) were males. The mean age of males and females was 56.12 ± 6.88 and 55.34 ± 4.23 years. Heterosexual mode was the commonest mode of acquiring HIV 74 (61.67%). Majority of them 77 (64.17%) were in WHO stage 1. Tuberculosis was seen in 32 (26.6%) The common co-morbidities seen were hypertension 93 (77.5%) and diabetes 8 (6.6%). The median CD4 count (n = 112) at presentation was 245 cells/mm^3 (IQR 145–426.2). Late presenters (CD4 less than 200 cells/mm^3) were 47 (41.96%).

Conclusion In our study 15% of patients attending ART centre were elderly. Majority of them had co morbidities. A significant proportion of them were late presenters. Physicians should have a high index of suspicion in diagnosing HIV in this age group as most of the symptoms of this disease may simulate the process of normal ageing. National programmes and policy makers must focus their attention on geriatric HIV.

P16.05 REGIONAL EPIDEMIOLOGICAL PATTERN OF AIDS-RELATED CANCERS IN CHILDREN

[1,2]O Adetokunboh*, [1]T Balogun. [1]Stellenbosch University, South Africa; [2]Centre for Healthcare Research and Training, Nigeria

Introduction Individuals living with human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) are vulnerable to develop certain malignancies such as Non-Hodgkin lymphoma, Kaposi's sarcoma and cervical cancer. Cancers may not be very common among the paediatric age group, however it is of significant importance among HIV-infected children. This study evaluates incidence and mortality patterns of the three AIDS-related cancers in the six World Health Organization (WHO) regions.

Methods The study data was accessed from the International Agency for Cancer Research GLOBOCAN 2012 database. Incidence and mortality rates for children aged 0–14 years old using age-specific rates and numbers.

Results African region had the highest number of NHL and KS new cases [38% (6296/16509)] and KS [96% (2081/2162)] respectively while Western Pacific region had 41% (68/165). The regions recorded 18,836 new cases (NHL – 88%, KS -11% and cervical cancer – 0.9%) while the mortality cases followed almost the same pattern. The total number of new cases of NHL for female was 5885, 10624 for the male (P = 0.1668), and that of KS was 963 for female and 1199 for male (P = 0.8757). Africa recorded the highest incidence rates for NHL (1.3/100 000 for female and 2.1/100 000 for male). The region also recorded the highest mortality rates for NHL (0.7/100,000 for female) and 1.0/100,000 for male). The situation was the same with KS with the African region having the highest incidence and mortality rates for both gender.

Conclusions The distribution of Non-Hodgkin lymphoma, Kaposi's sarcoma and cervical cancer followed the pattern of HIV prevalence in the WHO regions. Africa being the most affected region recorded the highest incidence and mortality in children (both HIV-infected and non – infected). There is no doubt that KS is predominantly an African problem while cervical cancer is rare among children despite the HIV epidemic.