Effectiveness of doxycycline to prevent sexually transmitted infections in high-risk populations: The Syphilaxis study

Authors:
Mowat Y[1], Vickers T[1,3], Haire B[1,2], McManus H[1], Hammoud M[1,9], McNulty A[3], Chow EPF[4,5,13], Fairley C[4,5], Maddaford K[4,5], Chen M[4,5,13], Read P[1,6], Gilliver R[6], Templeton DJ[1,7], Garton L[7], Zablotska-Manos I[10,11,12], Traeger M[8], Kaldor J[1], on behalf of the Syphilaxis Study team

[1]The Kirby Institute, University of New South Wales, [2]School of Public Health and Community Medicine, University of New South Wales, [3]Sydney Sexual Health Centre, [4] Melbourne Sexual Health Centre, Bayside Health, [5]School of Translational Medicine, Monash University, [6] Kirketon Road Centre, [7]Department of Sexual Health Medicine, Community Health, Sydney Local Health District, [8]Burnet Institute, [9]Australian Research Centre in Sex, Health and Society (ARCSHS), La Trobe University, [10]Postgraduate Program in Sexual and Reproductive Health, Faculty of Medicine and Health, University of Sydney, [11]Sydney Institute for Infectious Diseases, University of Sydney, [12]Western Sydney Sexual Health Centre, Western Sydney Local Health District, [13]Melbourne School of Population and Global Health, The University of Melbourne

Background:
Rates of bacterial STIs, including syphilis, have increased in Australia and globally, and men who have sex with men (MSM) and transgender people who have sex with men, living with HIV or taking HIV pre-exposure prophylaxis (PrEP), are disproportionately affected. Recent research, largely from RCTs in Europe and the US, suggests doxycycline prophylaxis is effective for STI prevention, but real-world data, particularly from Australia, are limited. We conducted an observational cohort study (the Syphilaxis Study) to evaluate the effectiveness of doxycycline prophylaxis for STIs in MSM and transgender people at high risk of STIs.

Methods:
Participants were recruited from three sexual health clinics in Sydney and one in Melbourne between 2020 and 2023. They were initially offered doxycycline 100mg as daily (STI-PrEP), and later as either STI-PrEP or post-exposure prophylaxis (STI-PEP). Participants were tested per standard care and followed for one year. Controls were selected from ACCESS and matched to participants, defined as individuals meeting Syphilaxis eligibility criteria within six months of the median study enrolment date (10th August 2021). STI incidence rates were compared between Syphilaxis participants and matched ACCESS controls. Poisson regression adjusted for age and HIV status.

Results:
Of 298 Syphilaxis participants, 253 were included in the analysis, alongside 339 controls. Participants were excluded due to inability to match in ACCESS (n=6) or no testing within the study window (n=38). Participation in Syphilaxis was associated with a reduced incidence of syphilis (incidence rate ratio [IRR] 0.06, 95% CI 0.02-0.14), chlamydia (IRR 0.26, 95% CI 0.17-0.40), and gonorrhoea (IRR 0.67, 95% CI

0.49-0.90). Adjustment for age and HIV status did not meaningfully change these estimates.

Conclusion:
Doxycycline prophylaxis was associated with significant reductions in syphilis, chlamydia, and gonorrhoea, supporting its potential role as a targeted STI prevention strategy in high-risk populations.

Disclosure of Interest Statement:
This research was funded by an NHMRC Program Grant.