

Potential impact and efficiency of doxyPEP prescribing strategies for reducing syphilis incidence among gay and bisexual men in Australia

Authors:

Traeger M^{1,2}, Asselin J¹, Aung HL³, Carter A³, Ong JJ^{4,5}, Fairley CK^{4,5}, McNulty A^{6,7}, Templeton DJ^{3,8,9}, Finlayson R¹⁰, Bloch M^{3,11}, Cornelisse V^{3,5}, Medland N³, Haire B³, Donovan B^{3,6}, Guy R³, Hellard M^{1,12}, Stoové M^{1,12}

¹ Burnet Institute, Melbourne, Australia, ² Department of Population Medicine, Harvard Medical School, Boston, US, ³ The Kirby Institute, UNSW Sydney, Sydney, Australia, ⁴ Melbourne Sexual Health Centre, Alfred Health, Melbourne, Australia, ⁵ Faculty of Medicine, Central Clinical School, Nursing and Health Sciences, Monash University, Melbourne, Australia, ⁶ Sydney Sexual Health Centre, Sydney, Australia, ⁷ School of Population Health, UNSW Sydney, Sydney, Australia, ⁸ Department of Sexual Health Medicine, Sydney Local Health District, Sydney, Australia, ⁹ Discipline of Medicine, Central Clinical School, Faculty of Medicine and Health, The University of Sydney, Sydney, Australia, ¹⁰ Taylor Square Private Clinic, Sydney, Australia, ¹¹ Holdsworth House Medical Practice, Sydney, Australia, ¹² School of Public Health and Preventive Medicine, Monash University, Melbourne, Australia.

Background:

Doxycycline post-exposure prophylaxis (doxyPEP) is highly effective at reducing syphilis among gay and bisexual men (GBM). However, doxyPEP raises concerns regarding antimicrobial resistance and side-effects of long-term use. We estimated the potential impact of hypothetical doxyPEP strategies to reduce syphilis while limiting doxycycline use.

Methods:

Syphilis laboratory data among GBM with ≥ 2 syphilis tests from 2016-2022 were extracted from 54 clinics in the ACCESS sentinel surveillance network. Infectious syphilis diagnoses were detected using an algorithm aligned with national case definitions. We evaluated counterfactual scenarios where doxyPEP was prescribed indefinitely to (1) all GBM; (2) GBM with HIV; (3) GBM using PrEP; (4) GBM with HIV or using PrEP; and scenarios where doxyPEP was prescribed for 12 months following diagnosis of (5) a bacterial STI (BSTI); (6) a rectal BSTI; (7) syphilis; (8) two BSTIs in 6m; (9) two BSTIs in 12m. In counterfactuals, syphilis incidence during doxyPEP use was reduced by trial efficacy estimates. For each strategy, we estimated the proportion of syphilis diagnoses averted, proportion of GBM prescribed doxyPEP, and number-needed-to-treat (NNT) for one year to avert one syphilis diagnosis.

Results:

Among 83,395 GBM (14.7% PWHIV, 39.4% PrEP-users), 15,806 syphilis diagnoses were detected over 281,190 person-years (rate=5.6/100py). In counterfactual scenarios, prescribing doxyPEP to all GBM averted 83% of syphilis diagnoses, but yielded the highest NNT (21.4). Prescribing doxyPEP to all PrEP-users/PWHIV (54% of GBM) averted 65% of diagnoses (NNT=17.5). The most efficient strategies were prescribing doxyPEP for 12m following: a syphilis diagnosis (NNT=5.1; 11% prescribed doxyPEP; 30% diagnoses averted); two BSTIs in 6m (NNT=7.2) and two

BSTIs in 12m (NNT=7.8). Restricting strategies 7-9 to PrEP-users/PWHIV only did not reduce NNTs.

Conclusion:

Prescribing doxy-PEP to individuals diagnosed with syphilis or multiple recent BSTIs, regardless of HIV status or PrEP use, could avert a substantial proportion of subsequent syphilis cases while minimising doxyPEP use.

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