Antimicrobial Consumption Among Users of Doxycycline Post-Exposure Prophylaxis in Milan, Italy

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BACKGROUND

-Doxycycline post-exposure prophylaxis (DoxyPEP) is an effective strategy to reduce bacterial sexually transmitted infections (bSTIs) among men who have sex with men (MSM).[1-4]
-Effective strategies to reduce antimicrobial use among members of key-populations are needed to reduce the risk of antimicrobial resistance (AMR).

-The aim of this study is to evaluate the changes in antimicrobial use of ceftriaxone, benzylpenicillin and doxycycline for the treatment of bSTIs, among MSM receiving DoxyPEP in a real-life setting.

METHODS

-This is a retrospective study of MSM in care for HIV or HIV pre-exposure prophylaxis (PrEP) at the Infectious Diseases Unit of IRCCS San Raffaele Scientific Institute in Milan, Italy.

-People who received DoxyPEP counselling and prescription from August 2022 (first DoxyPEP prescription, baseline) to July 2024 (data lock) were included.
-DoxyPEP prescription was offered to people with ≥1 STI or reporting condomless sex with ≥1 partner.
-DoxyPEP with doxycycline 200 mg within 72 hours of potential exposure was suggested for intensive sexual activity (>5 partners).

-All individuals with ≥1 follow-up PrEP or HIV visit after baseline and ≥1 PrEP or HIV visit before were included.
-DoxyPEP use and consumption was self-reported during routine follow-up visits.
-Individuals were tested for bSTIs (syphilis, Tp; chlamydia, Ct; gonorrhea, Ng) every 3 to 6 months according to local practice.

REFERENCES

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-Gökengin D, et al Lancet Reg Health Eur 2023.
-Raccagni AR, et al. Lancet Infect Dis 2025.

METHODS

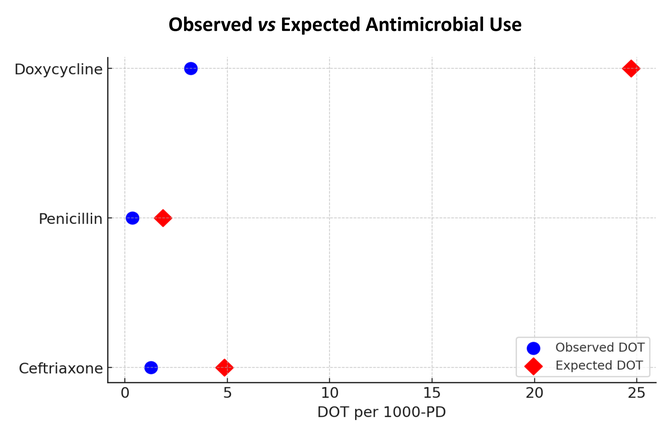
-Adjusted percentage (%) change (and 95% confidence interval, CI) in incidence rate (IR) of bSTIs before and after DoxyPEP prescription were estimated using a pre-post within-person analysis by Poisson mixed-effects model.
-Use of DoxyPEP for bSTIs prevention and use of ceftriaxone, benzylpenicillin, and doxycycline for the treatment of bSTIs was quantified as days of therapy (DOT) per 1000 person-days (1000-PD).
-The observed DOTs after DoxyPEP prescription were increased with the %changes derived from regressions to obtain the expected DOTs in the absence of DoxyPEP.

TABLE

	Overall n=754	DoxyPEP users n=222	Non-users n=532	p-value
Age (years, IQR)	38.3 [33.5;45.0]	38.9 [34.1;44.9]	38.1 [33.2;45.0]	0.323
Living with HIV	197 (26.1%)	69 (31.1%)	128 (24.1%)	0.056
HCVAb+	35 (5.12%)	19 (9.41%)	16 (3.32%)	0.002
HbsAg+	7 (1.81%)	1 (1.00%)	6 (2.10%)	0.682
PrEP user	531 (70.4%)	153 (68.9%)	378 (71.1%)	0.619
HIV-RNA (<50 copies/mL)*^	189 (97.9%)	67 (97.1%)	122 (98.4%)	0.618
CD4+ (cells/microL)*^	866 [727;1134]	889 [758;1173]	859 [689;1103]	0.475
CD4+/CD8+*^	0.95 [0.73;1.28]	0.94 [0.78;1.18]	0.97 [0.70;1.28]	0.944
4CMenB vaccination	169 (22.4%)	70 (31.5%)	99 (18.6%)	<0.001

*At time of DoxyPEP counselling. ^Among people with HIV.

FIGURE



RESULTS

-Overall, 754 MSM were prescribed DoxyPEP between August 2022 and July 2024.
-DoxyPEP use was reported by 222 (29.4%) individuals over follow-up [DoxyPEP users].
-Median follow-up among DoxyPEP users was 15.8 months (IQR=12.1-19.2) and 10.8 months (6.88-13.1) before and after prescription, respectively.
-Individuals' demographic and clinical characteristics are presented in Table.

-Among DoxyPEP users, 401 bSTIs (Tp 70, Ct 139, Ng 192) were detected before DoxyPEP prescription and 146 (Tp 26, Ct 32, Ng 88) after DoxyPEP prescription.
-Overall, DOT per 1000-PD was 1.26 for ceftriaxone, 0.37 for penicillin and 3.21 for doxycycline after DoxyPEP prescription.
-DoxyPEP DOT per 1000-PD was 7.00.

-Expected DOT per 1000-PD in the absence of DoxyPEP was 4.85 (95%CI=3.82-6.41) for ceftriaxone, 1.86 (95%CI=1.17-2.87) for penicillin, and 24.71 (95%CI=17.18-37.36) for doxycycline.
-Doxycycline expected DOT in the absence of DoxyPEP (24.1) exceeded the sum of DoxyPEP DOT and doxycycline DOT for treatment of bSTIs after DoxyPEP prescription (13.21) (Figure).

CONCLUSIONS

-A significant reduction in all considered antimicrobials used for the treatment of bSTIs was achieved among DoxyPEP users.
-Doxycycline overall use was reduced when accounting for its therapeutic and prophylactic use.
-Despite existing concerns for AMR among DoxyPEP users, this strategy might reduce antimicrobial use for treatment of bSTIs.

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