Pre-exposure prophylaxis for HIV infection and new sexually transmitted infections among men who have sex with men

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We conducted a meta-analysis to summarize rates of sexually transmitted infections among men who have sex with men (MSM) on pre-exposure prophylaxis (PrEP) for HIV versus MSM not using PrEP. Incidence rate ratios showed that MSM using PrEP were 25.3 times more likely to acquire a Neisseria gonorrhoeae infection, 11.2 times more likely to acquire a Chlamydia trachomatis infection, and 44.6 times more likely to acquire a syphilis infection versus MSM not using PrEP.

The safety and effectiveness of pre-exposure prophylaxis (PrEP) to prevent HIV type 1 infection among MSM has been verified in randomized controlled trials and ‘real-world’ studies [1,2]. However, high incidence of sexually transmitted infections (STIs) among participants in PrEP trials has led clinicians and public health advocates to be concerned that PrEP use might lead to higher STI incidence because of increased sexual risk behavior [3]. We conducted a meta-analysis to evaluate differences in STI acquisition among MSM on PrEP for HIV versus MSM not using PrEP.

In March 2016, we conducted a literature review with the MeSH terms ‘SYPHILIS’ OR ‘GONORRHEA’ OR ‘CHLAMYDIA’ OR ‘HOMOSEXUALITY’ OR ‘MALE’ OR ‘TRANSGENDER PERSONS’ AND ‘COHORT STUDIES’ using PubMed as a search platform. We identified over 140,000 studies, including all five studies on PrEP (Supplemental Table; http://links.lww.com/QAD/A944). We restricted studies to only those with the following inclusion criteria: English language, cohort of MSM, and STI incidence rates reported with nucleic acid amplification testing. We conducted a meta-analysis of those studies to compare incidence rate ratios of STIs between MSM using PrEP versus MSM not using PrEP.

Of the studies that only reported percentages of incident infections, we estimated the number of incident infections based on the reported percentage and total number of participants in the study. In our meta-analysis of individual STIs, we included all studies that reported incidence rates of our STI of interest. The pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD) study [2] had two study arms to compare the effectiveness of PrEP – an immediate PrEP intervention group and a deferred PrEP intervention group. We included the immediate intervention group of the PROUD study into our MSM on PrEP group and we included the deferred intervention group of the PROUD study into our MSM without PrEP group in our meta-analysis.

Of the 14 studies, five were conducted in MSM that were administered PrEP and 14 were conducted in MSM without PrEP. Incidence rate ratios showed that MSM using PrEP were 25.3 times more likely to acquire a Neisseria gonorrhoeae infection, 11.2 times more likely to acquire a Chlamydia trachomatis infection, and 44.6 times more likely to acquire a syphilis infection, when compared with MSM not using PrEP (Table 1). We repeated the meta-analysis excluding studies conducted before 1999 and found similar results.

Our analyses found that use of PrEP for HIV infection was associated with increased risk of STI acquisition among MSM. The mechanism of increased risk of STIs among PrEP users may be due to multiple factors, including increased STI detection among MSM clinically managed on PrEP [4], increased number of sex partners [5], and increased condomless sex [6]. Limitations of our analysis include utilization of studies with heterogeneous populations, different frequencies of STI screenings, and differences in diagnostic tests used. Also, PrEP studies recruited MSM with high-risk sexual behavior, whereas MSM in studies not using PrEP may have had different baseline risk behavior.

Our results, as well as prior studies, support updating Center for Disease Control and Prevention guidelines to recommend that MSM using PrEP receive quarterly STI screenings, an increase from their current guidelines that recommend biannual to quarterly screenings [7,8]. Furthermore, physicians must not only vigilantly identify patients that may benefit from PrEP but also provide their patients with a sexual health prevention package that includes quarterly STI screenings, timely treatment of...
infection, expedited partner treatment, and rescreening if positive. In addition, our results and prior reports, which not only found a higher incidence of STI among PrEP users versus nonusers [2] but also high rates of condomless anal sex among PrEP users [9], suggest that more research is needed to understand if PrEP causes a higher incidence of STIs among MSM. We must ensure that our efforts fighting one public health crisis do not lead to another.

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Conflicts of interest

There are no conflicts of interest.

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