

Hot Topic

National STD Curriculum Podcast

PrEP and STDs

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Season 1, Episode 5

This episode reviews some of the available literature on whether PrEP (preexposure HIV prophylaxis) use contributes to the increased rates of STDs.

Topics:

- STDs
- prep
- sexually transmitted infections
- preexposure hiv prophylaxis

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[00.00] Introduction

Hello everyone. My name is Meena Ramchandani. I'm an infectious disease physician at the University of Washington in Seattle. This podcast is dedicated to an STD [sexually transmitted disease] literature review for health care professionals who are interested in remaining up-to-date on the diagnosis, management, and prevention of STDs.

[00.24] Background

The question for this episode is: does PrEP, or preexposure HIV prophylaxis, increase the risk of STDs? There

have been declines in new HIV infections in the United States, but STD rates continue to climb, and have been climbing upward since the early 2000s. One just has to take a look at the STD surveillance report by the CDC [Centers for Disease Control and Prevention] to realize that we're at an all-time high, and they're not going away. There have been 2.5 million cases of chlamydia, gonorrhea, and syphilis alone, and this is going to have some major implications. So one question that comes up is whether PrEP, which is one of the most important tools we have to decrease the incidence of HIV, contributes to the increase in STDs that we are now seeing. Whether PrEP use leads to decreased condom use or risk compensation has been an ongoing important discussion in the STD world. In the placebo-controlled trials of PrEP, incidence of STDs did not change, but the participants were blinded to whether they were on PrEP or not. So if participants didn't know they were actually taking PrEP, they may not have changed their behavior; and this makes the lack of an association difficult to apply to the non-research clinical setting. Early clinical trials have also reported no evidence of decreased condom use among PrEP users. But perhaps people were unlikely to change their sexual behavior unless they were confident that PrEP actually worked, and they didn't know that at the time. So the data on the association between PrEP and increased incidence or rates of STDs is still not clear, or is controversial. For this episode, I'll be concentrating on the MSM [men who have sex with men] population where we have the most data on behavior and STD risk and I'm going to cover four articles on this topic that were released in 2019.

[02.07] Paper #1

Traeger MW, Cornelisse VJ, Asselin J, et al; and PrEPX Study Team. Association of HIV preexposure prophylaxis with incidence of sexually transmitted infections among individuals at high risk of HIV infection. *JAMA*. 2019 Apr 9;321(14):1380-1390.

[\[PubMed Abstract\]](#)

The first article I'd like to discuss references a large study that was published in *JAMA* in April 2019 by Dr. Michael Traeger and his colleagues, and this was titled "Association of HIV preexposure prophylaxis with incidence of sexually transmitted infections among individuals at high risk of HIV infection."

Some interesting features I'd like to point out of this study is that it was a large cohort of about 2,900 individuals in Australia and:

1. The authors evaluated STD incidence (specifically looking at chlamydia, gonorrhea, or new syphilis), as well as behavioral risk factors among gay and bisexual men who use PrEP.
2. They followed patients for about one year—so a substantial period of time—and they found that STDs were diagnosed in about 48% of participants. It was interesting that they found that 25% of participants accounted for the majority (76%) of STDs in the follow-up period.
3. Among around 1,300 participants that the authors had pre-enrollment data on, STD incidence increased from around 70 per 100 person-years prior to enrollment to 98 per 100 person-years during the follow-up period and this had an incidence rate ratio of 1.41.
4. An important feature to point out about this manuscript is that the authors adjusted for STD testing frequency with PrEP use—and they still found there was an increase in the incidence of any STD. They had an adjusted incidence rate ratio of 1.12 with a P value of 0.006, as well as for chlamydia infections they had an adjusted incidence rate ratio of 1.17. So, what's interesting to point out is that this held true for PrEP-naïve participants—those who were PrEP-naïve prior to the study—but did not hold true for PrEP-experienced individuals—those who had experienced PrEP prior to the study. It is also interesting that no significant change was observed for gonorrhea or for syphilis.

Overall, what this group found is that among gay and bisexual men using PrEP, STDs were highly concentrated among a subset of individuals. Not surprisingly, characteristics associated with greater STD risk in a multivariable model included younger age, diagnosis of an STD prior to enrollment, greater number of anal sex partners, as well as group sex. In summary, they found an increased incidence of STDs compared with rates observed prior to PrEP use, but this wasn't necessarily the case for all participants in the study, so we still need more data in this area and this will lead to another few articles I'm going to discuss in this episode.

[04.51] Paper #2

Montaño MA, Dombrowski JC, Dasgupta S, et al. Changes in sexual behavior and STI diagnoses among MSM initiating preP in a clinic setting. *AIDS Behav.* 2019 Feb;23(2):548-555. [\[PubMed Abstract\]](#)

The next two papers are linked in that they come from the same group. Both manuscripts are written by Dr. Michalina Montaño and colleagues. The first paper is titled “Changes in sexual behavior and STI diagnoses among MSM initiating PrEP in a clinic setting,” and this article was published in *AIDS and Behavior* in February 2019. So, this manuscript:

1. Examined the changes in sexual behavior and STD prevalence among 183 high-risk MSM initiating PrEP in an STD clinic in Seattle, WA.
2. The authors found a decrease was observed in condom use among MSM who were on PrEP—more specifically, at 12 months after PrEP initiation, MSM were 46% more likely to report never using condoms compared to the initial PrEP visit.
3. The study also found a higher percentage of MSM were diagnosed with an STD during PrEP use. For example, 49% of MSM were diagnosed with an STD while using PrEP compared to 35% prior to PrEP use. But the authors suggest this might be due to increased STD screening while on PrEP, based on current recommended guidelines. The reason they thought this is because they did not see a change in urethral gonorrhea with PrEP use, and urethral gonorrhea is usually symptomatic. The STDs that increased in PrEP users were the asymptomatic ones, ones that a clinician would catch with increased frequency of screening.

[06.21] Paper #3

Montaño MA, Dombrowski JC, Dasgupta S, et al. Differences in sexually transmitted infection risk comparing preexposure prophylaxis users and propensity score matched historical controls in a clinic setting. *AIDS.* 2019 Sep 1;33(11):1773-1780. [\[PubMed Abstract\]](#)

To follow up this study, Dr. Montaño and colleagues published another article titled “Differences in STI risk comparing PrEP users and propensity score-matched historical controls in a clinic setting,” published in *AIDS and Behavior* in September 2019.

1. This study was unique in that they used propensity score matching to match historical controls to PrEP users in an STD clinic. This is important as it allows for the comparison of PrEP users to a similar patient population of non-PrEP users from the same clinic—so, for example, one with similar risk factors for acquiring HIV as well as other STDs.
2. The authors evaluated the incidence of chlamydia, gonorrhea, and early syphilis, as well as the time to first symptomatic STD among PrEP users and nonusers.
3. They found the incidence for bacterial STDs was 2- to 3-fold higher in PrEP users. More specifically, for PrEP users compared to non-PrEP users, the incidence rate ratios for chlamydia were 3.2, for gonorrhea was 2.8, and for early syphilis was 2.9.
4. They also found that the time to first symptomatic STD was shorter in PrEP users compared to non-PrEP users. So, for example, 120 days compared to 185 days in those who did not use PrEP. And, this is an important point, because if the STD is symptomatic, the patient would present for treatment regardless of STD screening frequency. This suggests a higher incidence of STDs and faster time to first symptomatic STD in PrEP users that cannot be explained by the increased frequency of STD testing alone.

Overall, both these studies suggest that among MSM on PrEP, there are decreases in condom use and a higher risk of STDs among PrEP users independent of increased STD screening. It’s not clear what the future

holds given these results in terms of STD rates in the MSM community, but they do suggest PrEP may be a contributing factor in increasing STD rates among MSM in the current time.

[08.36] Paper #4

Hoornenborg E, Coyer L, Achterbergh RCA, et al; and Amsterdam PrEP Project team in the HIV Transmission Elimination AMsterdam (H-TEAM) Initiative. Sexual behaviour and incidence of HIV and sexually transmitted infections among men who have sex with men using daily and event-driven pre-exposure prophylaxis in AMPrEP: 2 year results from a demonstration study. *Lancet HIV*. 2019 Jul;6(7):e447-e455.

[\[PubMed Abstract\]](#)

On a similar topic, but looking at different types of PrEP users, a study by Elske Hoornenborg and colleagues titled “Sexual behavior and incidence of HIV and sexually transmitted infections among men who have sex with men using daily and event-driven pre-exposure prophylaxis in AMPrEP [Amsterdam PrEP]: 2 year results from a demonstration study” was published June 2019 in *Lancet HIV*.

Important features of this study that I’d like to point out:

1. The authors evaluated the incidence of STDs in 365 higher risk MSM and two transgender women on PrEP at an STI [sexually transmitted infection] clinic in Amsterdam.
2. This study looked at and compared participants who went on daily PrEP vs event-driven PrEP (also known as “on demand” or 2-1-1 PrEP) to evaluate their incidence of STDs over time. The patients had every three months STD screening. The authors found that 73% of participants chose daily PrEP and 27% chose event-driven PrEP.
3. In both the first and second year on PrEP, just over 50% of participants were diagnosed with one or more STDs—so a pretty high number. But the incidence of STDs did not change over time in the 2-year period of follow up in either group.
4. The authors found that STD incidence was 41% lower in the event-driven PrEP group compared to the group taking daily PrEP medication, and this could be due to differences in sexual behavior. They did find that the number of condomless anal sex acts with casual partners per three months increased over time, and this was predominantly seen in the daily PrEP users.

So, this study found there might be higher incidence of STDs in those patients who use daily PrEP compared to patients who use on-demand PrEP. One limitation of this study is that they did not calculate STD incidence rates before PrEP initiation, so they were unable to compare incidence of STDs pre- and post-PrEP use. They also found that 28% of participants reported at least one STD diagnosis and/or treatment outside the study clinic visits; this could potentially underestimate STD incidence found in the study. I think we need more data in this area, so look out for future publications on this topic.

[10.56] Summary

To conclude, I’d like to summarize some key points from this session:

1. More data are needed to fully understand the effect of PrEP, or preexposure HIV prophylaxis, in the non-research setting, and the relation between PrEP use and increased STD risk.
2. We do see some evidence in the literature of risk compensation in the form of decreased condom use in the MSM population on PrEP, and there might be increased incidence of bacterial STDs as well, but more data is really needed.
3. It is important to point out that the acquisition of STDs remains high among those who go on PrEP, and so regular STD testing (for example) every three months is recommended. Although, I will point out that those enrolling in PrEP studies may not be representative of the wider population who will use PrEP outside of a study environment.

In summary, PrEP is one of the most important HIV prevention tools we have, and regardless about its effect

on risk compensation as well as STD incidence, this should not prevent a clinician from providing PrEP to patients at high risk of HIV acquisition. STDs can be relatively easily treated and cured but HIV is lifelong, so if you're seeing a patient with risk factors for HIV acquisition, definitely put them on PrEP, but just screen them for STDs as well.

[12.11] Credits

This podcast is brought to you by the National STD Curriculum, the University of Washington STD Prevention Training Center, and is funded by the Centers for Disease Control and Prevention.

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