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INFECTIOUS DISEASES | RESEARCH ARTICLE

Evaluation of the awareness, knowledge and use of pre-exposure prophylaxis (PrEP) among the serodiscordant partners of HIV infected individuals on ART in an urban HIV clinic

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Abstract: The awareness, knowledge and acceptance of pre-exposure prophylaxis (PrEP) among at risk group greatly depend on the collaborative efforts of CDC, health care workers and other government and non-governmental organizations. We conducted a cross-sectional study to evaluate the knowledge of PrEP among HIV patients and indirect assessment of the use of PrEP by their serodiscordant sexual partners. Two (4%) of the study participants whose partner(s) were at risk had discussed the use of PrEP with their partner(s) but none of their partners was on PrEP. The study revealed that awareness of PrEP may be slowly increasing but the uptake of PrEP is low. Awareness of PrEP does not translate to knowledge of PrEP. This is why there is need for health care professionals especially primary care physicians including HIV providers to incorporate PrEP counseling programs in the care of PLWHA and their families.

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Celestine Ishiekwene is an infectious diseases physician with Genesis Health group, Davenport Iowa.

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Yu Shia Lin is an infectious Disease physician and the research coordinator for the Maimonides Medical Center. Finally but not the least,

Margaret Kuhn-Basti is infectious disease physician in the Department of Infectious Diseases, Maimonides Medical Center. We have interest in care of PLWHA and their families. Despite the effectiveness of PrEP in preventing HIV infection among serodiscordant couples, the uptake is low. This prompted the authors to evaluate the awareness, knowledge and use of pre-exposure prophylaxis (PrEP) among the serodiscordant partners of HIV infected individuals on ART. The next step will be to study the primary care providers' awareness, knowledge and ability to discuss PrEP with HIV serodiscordant couples.

PUBLIC INTEREST STATEMENT

Since the diagnosis of AIDS was first reported by Center for Disease Control and Prevention in the early 1980s, more than 35 million persons are currently living with HIV. About 1.1 million persons living with HIV infection in the United States. About 37,000 new diagnosis are made every year. The quest to reduce the transmission of HIV have led to so many researches including PrEP (Pre-exposure prophylaxis) with medication. PrEP has been found to effectively reduce new infection of HIV when used appropriately. Everyone who is at high risk of HIV infection need to know about this new way of prevention of HIV infection and have the discussion with their partners and their health providers.

Subjects: HIV/AIDS; Medicine; AIDS & HIV Infection

Keywords: HIV/AIDS prevention education < Service Practices; peer education < Service Practices; HIV/AIDS Transmission &/or Risk; HIV/AIDS transmission < HIV/AIDS Transmission &/or Risk; HIV prevention < HIV/AIDS Transmission &/or Risk; prevention < HIV/AIDS Transmission &/or Risk

1. Introduction

Many advances in HIV prevention have been made over the past 30 years. Despite these advances, approximately 35 million people are living with HIV and about 2.1 million new diagnoses of HIV are made annually worldwide representing 38% decline from 2001 (UNAIDS, 2014). The CDC reported that about 1.2 million people aged 13 and older are living with HIV in USA and about 39,513 new diagnoses are made each year (HIV in the United States: At a Glance, 2017). At the end of 2015, male-to-male sexual contact accounted for 82% of new infections in males and heterosexual contact accounted for 74% of new infections in females (Diagnoses of HIV Infection in the United States and Dependent Areas, 2014). Pre-exposure prophylaxis (PrEP) with antiretroviral (ART) has been studied with variable efficacy in reducing the risk of acquiring HIV in at risk groups (Baeten et al., 2012; Choopanya et al., 2013; Grant et al., 2010; Marrazzo et al., 2015; Molina, Capitant, & Spire et al., 2015; Thigpen et al., 2012a). The use of PrEP was approved by FDA in 2012 (CDC Statement on FDA Approval of Drug for HIV Prevention, 2016). It involves the administration of ART to at risk individuals who are HIV negative to prevent HIV infection.

The guidelines for PrEP, as provided by the World Health Organization (WHO expands recommendation on oral preexposure prophylaxis of HIV infection (PrEP), 2016), the United States Public Health Service (US Public Health Service. Preexposure prophylaxis for the prevention of HIV infection in the United States, 2014), and the International Antiviral Society-USA Panel (HIV Prevention in Clinical Care Settings, 2014), recommend prophylaxis for at risk candidates who are highly motivated and committed to medication adherence and follow up. When PrEP is combined with other risk reduction methods, 92% efficacy was demonstrated among patients with detectable level of drugs (Preexposure prophylaxis for the prevention of HIV infection in the United States, 2014; Thigpen et al., 2012b). The only FDA approved regimen for PrEP is a combination of tenofovir and emtricitabine. The at risk individuals for whom PrEP is recommended are serodiscordant partners, men who have sex with men (MSM) who have reported high-risk sexual behaviors or a documented sexually transmitted infection in the 6 months, people who have risky sexual behaviors with people at high risk of HIV infection, more than one non-occupational use of post-exposure prophylaxis and injection drug users who have recently report needle sharing (Preexposure prophylaxis for the prevention of HIV infection in the United States, 2014). A study acceptability of PrEP among gay and bisexual couples in serodiscordant relationships demonstrated an increase likelihood of decreasing or stopping the use of condom during sexual intercourse (Brooks et al., 2012). The belief that PrEP will increase risk-taking sexual behavior among heterosexual HIV-uninfected people was not demonstrated in a study among African women and men (Fowler, Arkell, Abouyannis, James, & Roberts, 2014).

Therefore, it is recommended that PrEP counseling be provided to serodiscordant partners in conjunction with other preventive measures (WHO expands recommendation on oral preexposure prophylaxis of HIV infection (PrEP), 2016; US Public Health Service. Preexposure prophylaxis for the prevention of HIV infection in the United States, 2014; HIV Prevention in Clinical Care Settings, 2014; Thigpen et al., 2012b). The most important factor in the success of PrEP is the acceptability among at risk groups. Awareness and knowledge of PrEP affect its acceptability A study done in Kenya revealed that irrespective of the socioeconomic status, serodiscordant couples are more willing to accept treatment as prevention (TasP) than PrEP due to concerns about side effects and cultural acceptance of prophylactic medication (Fowler et al., 2014). Our study is focused on this HIV positive patients who attend our Life Forward HIV Program to evaluate their knowledge of PrEP and the use of PrEP by their

partners. This study also will give us the opportunity to increase the awareness of PrEP among our HIV patients; and subsequently increase the use of PrEP among their serodiscordant partners.

2. Materials and methods

This is a cross-sectional study of HIV patients attending our Life Forward HIV Program in a Level 1 Trauma Center in Brooklyn, New York. Inclusion criteria include all HIV positive patients attending our Life Forward HIV Program. Exclusion criteria include patients who refused to complete questionnaire. We aim to evaluate the knowledge of PrEP among the HIV infected patients attending our Life forward HIV Program, barriers to using PrEP among their serodiscordant partners and to use this opportunity to educate our patients about PrEP and the need for their serodiscordant partners to use PrEP.

Patients were given questionnaires which include participants' demographics, educational status, employment status, partner's status, knowledge of PrEP, use of PrEP by serodiscordant partners and reasons for not using PrEP. Data were obtained with semi-structured interviewer-administered pretested questionnaires. The institutional review board (IRB) approved the study, and data were collected between May 2016 and December 2016. Fifty-one people participated in the study out of 207 HIV positive patients that attended the clinic during the period of the study.

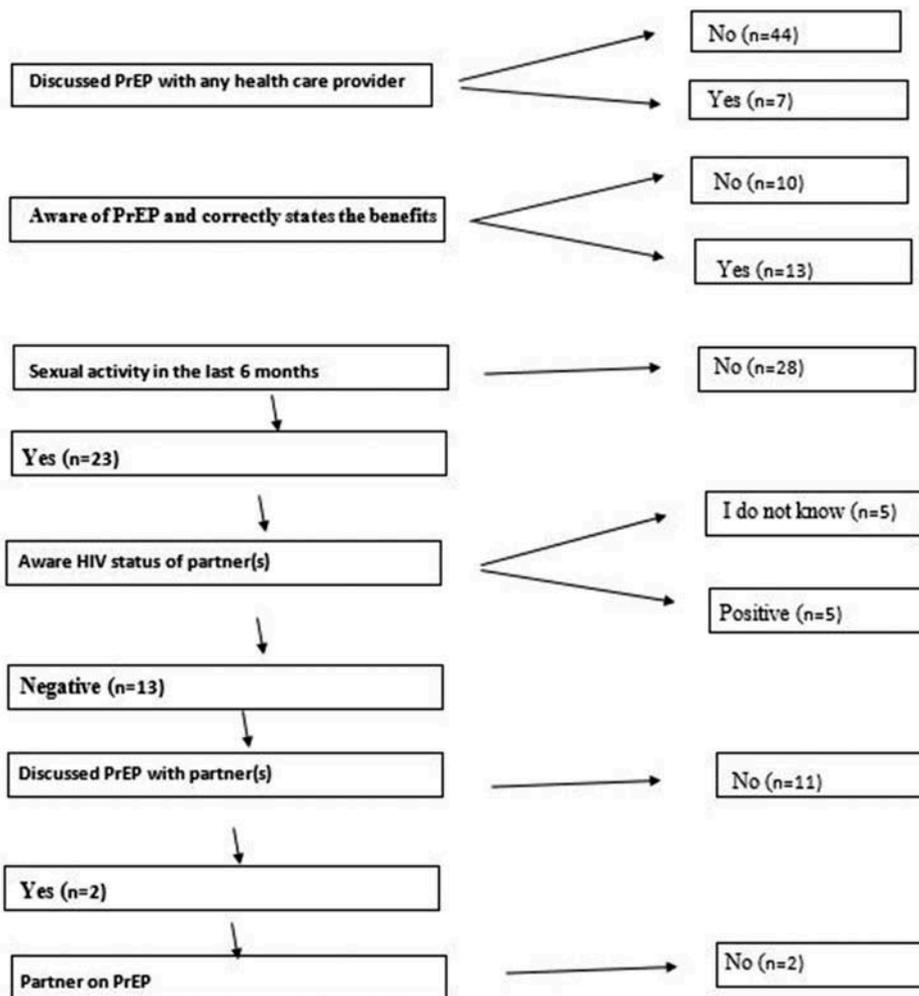
3. Results

Twenty nine (57%) of the studied population were males while 22 (43%) were female (Table 1). Majority of the participants, 26 (44%), were between the ages of 25 and 35 years while 29 (57%) were unemployed. Forty (68%) had high school or college as their highest level of education. Only four (8%) of the participants had primary education as their highest level of education and they were assisted in reading the questionnaire. The racial distribution was almost evenly distributed among whites, Hispanics and blacks/African American. Twenty nine participants (57%) have never heard of PrEP while 22 (43%) had heard of PrEP.

The sexual orientation of 69% of the participants was heterosexual and 23% MSM. Only seven (13.7%) of the studied population have heard some form of discussion about PrEP with their healthcare providers

Table 1. Demographic distribution of the participants			
		Aware of PrEP (N = 22)	Not aware of PrEP (N = 29)
Gender	Male	12	17
	Female	10	12
		22	29
Mean age in years (standard deviation)		43.8(11.8)	49.3(10.9)
Level of education	Primary	0	4
	Middle school	2	5
	High school	11	12
	College	9	8
	Graduate School	1	9
Race	White	10	8
	Hispanic	4	11
	Black/African American	7	8
	Asian	1	2
Employment status	Yes	13	9
	No	9	20

Figure 1. Schematic representation of the responses.



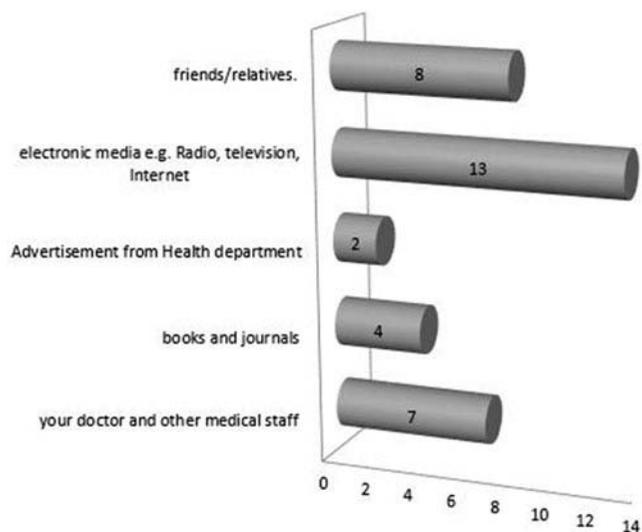
notwithstanding that 39 (76%) of the population had other health care providers in addition to their HIV care providers (Figure 1). Out of the 22 that were aware of PrEP, only 13 (59%) correctly stated the benefits of PrEP.

Twenty-three participants (45% of the studied population) stated they were sexually active within 6 months of the study out of which 13 (57%) knew their sexual partners were HIV negative. Two (4%) of the study participants whose partner(s) were at risk had discussed the use of PrEP with their partner(s) but none of their partners was on PrEP. The bar chart (Figure 2) shows that (54.2%) of the participants who had were aware of PrEP got their information on PrEP from electronic media, e.g. radio, television, internet.

4. Discussion

The use of PrEP among serodiscordant partners had been demonstrated to lead to reduced stress and increased trust (Patel et al., 2016). Based on a recent study in United States, 25% of adult MSM aged 18–59 years, 18% of persons who inject drugs and 0.4% of heterosexually active adults have indications for PrEP to prevent HIV infection (Vital Signs: Estimated Percentages and Numbers of Adults with Indications for Preexposure Prophylaxis to Prevent HIV Acquisition—United States, 2015). Despite the effort of CDC, and other government and non-governmental organizations to increase the uptake of PrEP (Pre-exposure Prophylaxis (PrEP) for HIV Prevention, 2017), the uptake has been slow. A study from 2015

Figure 2. Sources of information on PrEP.



in Washington revealed that 23% of high-risk MSM reported taking PrEP (Berstein et al., 2008). None of this study participants' sexual partners were on PrEP. A possible barrier to PrEP uptake may be nondisclosure of sexual orientation or same-sex behavior to providers (Berstein et al., 2008), but only two of our HIV infected patients who have the knowledge of PrEP and their partners are HIV negative had discussed the use of PrEP with their partners. In a multi-city online survey of 525 primary care providers in United States, knowledge, and experience with prescribing PrEP; were some of the factors that are likely to affect the uptake of PrEP (Petroll et al., 2016). This may have been the reason only seven of our study participants have discussed PrEP with their physicians notwithstanding that overwhelming majority of the participants have other PCP apart from their HIV physicians.

Our study revealed that 43% among our participants was aware of PrEP and the knowledge was 25% which was consistent with figures observed among HIV negative white gay and bisexual men in Jackson, Mississippi and Boston, Massachusetts (Hood et al., 2016). Another study among Women in New York City revealed that the 74% of the participants and 57% of staff members of the health care facility had not heard about PrEP before participating in the study (Collier, Colarossi, & Sanders, 2017).

It is pertinent to highlight the limitations of this study. The sample size is small and the study was done in one out many HIV treatment center in New York City. These made it impossible to generalize the finding. In addition, HIV patients with undetectable viral loads who have low risk of HIV transmission were included in this study. Considering that our participants have other healthcare providers, it shows that there is need for healthcare participants to take active role in spreading the knowledge of PrEP. Our study is an indirect assessment of the knowledge and use of PrEP among the high-risk population. Our findings will help health care professionals to conduct PrEP education to both HIV positive and HIV negative patients at risk of HIV infection.

In conclusion, the benefits of PrEP cannot be overemphasized. HIV clinic visit is an important entry point to ongoing care and support for People living with HIV and AIDS (PLWHA) and their families. Health care professionals should pioneer the crusade to increase PrEP awareness, knowledge and acceptance in at-risk populations as well as PLWHA by incorporating PrEP education into existing programs including quality improvement programs. While cure for HIV is being investigated, perpetuation of the benefits of PrEP need to be highlighted with suggestions on how to maximize the awareness, knowledge and uptake.

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Competing Interests

The authors declare no competing interests.

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