HIV Pre-exposure Prophylaxis: Pharmacists Knowledge, Perception and Willingness to Adopt Future Implementation in a Zimbabwean Urban Setting

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Truvada® was approved for use in prevention of sexually acquired human immunodeficiency virus in 2012. Consumers may require information about pre-exposure prophylaxis from pharmacists since consultation is free. The aim of the study was to assess pharmacists' knowledge, perception and willingness to adopt pre-exposure prophylaxis. In this descriptive cross-sectional study, community and hospital pharmacists in Harare were interviewed using a standard questionnaire between September and October 2012. Descriptive statistics and multiple linear regression analysis were used for data analysis. The response rate was 90%. Females comprised 47% of respondents. Most pharmacists had a negative perception about pre-exposure prophylaxis. Most pharmacists (94%) were willing to stock pre-exposure prophylaxis in their pharmacies. Cost, accessibility and increase in promiscuity were cited as major hindrances to future implementation. Only 58% of respondents were knowledgeable about pre-exposure prophylaxis. There is need for the government to increase accessibility and improve on awareness strategies for pre-exposure prophylaxis in Zimbabwe.

Key words: Truvada®, pre-exposure prophylaxis, pharmacist, knowledge, perception

INTRODUCTION

On 16 July 2012, for the first time, the Food and Drug Administration (FDA) approved a drug to prevent human immunodeficiency virus (HIV) infection. This announcement marked the first-ever FDA approval of a drug to reduce the risk of HIV infection in adults. Truvada® (tenofovir disoproxil fumarate 300mg/emtricitabine 300mg) is licensed for once daily dosing in combination with safer sex practices to reduce the risk of sexually acquired HIV infection in adults who do not have HIV but are at high risk of becoming infected [1]. Truvada® is available in Zimbabwe and is currently used as treatment for HIV infection. This HIV prevention strategy is termed HIV Pre-exposure prophylaxis (PrEP). The PrEP is defined as the regular use of antiretroviral medications by HIV-negative individuals to reduce the risk of new HIV acquisition [2, 3].

In Zimbabwe, knowledge of HIV prevention methods has increased since 2005-2006, especially among women. The 2010-2011 Zimbabwe Demographic Health Survey (ZDHS) reported that 77% of women knew HIV could be prevented by using a condom and by limiting sexual partners which is an improvement over the 65% reported in the 2005-2006 ZDHS. Among men, this percentage increased from 71% in the ZDHS 2005-2006 to 79% in 2010-2011 [4]. Studies in Zimbabwe have suggested significant differences in the knowledge, perception and acceptability of microbicides among heterosexual men and women at high risk of HIV/AIDS [5,6]. Microbicides are also termed PrEP and are products (formulated as gels, sponges, films or rings) that can be applied to the vaginal or rectal mucosa with the goal of preventing or significantly reducing the acquisition of sexually transmitted infections (STIs) including HIV [7].

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Although these studies focused on vaginal microbicides, men were generally supportive of the idea of a microbicide if they are safe and effective [8]. Acceptability of microbicides was also high among women and they were unanimous in their desire for such a product [9]. Further, although consumers in Zimbabwe have been shown to accept PrEP, studies exploring healthcare providers' perspectives on PrEP are still lacking. This study aims to fill this void.

Tripathi *et al*. conducted a survey on healthcare providers' knowledge and perception about HIV PrEP in southern United States of America from 2006 to 2008. The results suggested that despite a high rate of acceptance of PrEP among the healthcare providers in the survey, the majority of them were concerned about safety, efficacy and cost of implementation as a public health intervention [10]. People in Zimbabwe are aware of the HIV prevention strategies and may also require more information about PrEP.

Pharmacies could be the first point of call for patients' enquiries about PrEP, since there are no consultation fees involved. Thus there is a need to conduct surveys to gather information on pharmacists' knowledge, perception and willingness to adopt future implementation of PrEP. The purpose of this study was to investigate the knowledge and perception of PrEP among pharmacists in Harare and their willingness to adopt future implementation of PrEP in Zimbabwe.

METHODOLOGY

A descriptive cross-sectional study was conducted between September and October 2012 using a self-administered questionnaire as the data collection tool. The study sample comprised community (i.e., retail) and hospital pharmacists in Harare including those from the major referral hospitals namely Parirenyatwa and Harare Hospitals. A list of the registered pharmacies was obtained from the Medicines Control Authority of Zimbabwe (MCAZ). From this list, systematic sampling was used to identify pharmacies to be sampled. The Cochran formula was used to give a sample size of 125 pharmacists.

Data analysis

A pilot survey was conducted using a sample of five pharmacists to assess ease of interpretation of the questionnaire and adjustments were made accordingly. The SPSS software was used for statistical analysis. A 5% level of significance was adapted for testing analysis. Statistically significant differences were considered when a p value < 0.05 was obtained.

In the perception section, a numerical value was assigned to each choice in the range of responses: strongly disagree, somewhat disagree, neutral, somewhat agree and strongly agree, and the choices scored from 1 to 5 in that order. Data was analyzed using descriptive statistics. Chi-tests were used to assess differences in age, gender, years of practice and pharmacy setting on perception of PrEP.

On the section on knowledge, there were 15 questions measuring knowledge. A correct response was scored 1 and an incorrect response was scored 0. Pharmacists were termed knowledgeable if they scored 9 or greater (i.e., correct answers $\geq$ 60%) and termed not knowledgeable if total score was less than 9. Simple logistic regression was used to assess differences in age, gender, years of practice and pharmacy setting on knowledge of PrEP at 95% confidence interval.

Ethical considerations

Ethical approval was obtained from the research ethics committee at the Joint Parirenyatwa Hospital and College of Health Sciences and the ethics review boards of Parirenyatwa and Harare Hospitals before commencement of the study.

RESULTS

A total of 125 questionnaires were distributed and 112 were filled in. This gave a response rate of 90%. Those who declined mentioned the reasons that they had no time (n=7), they were busy (n=3), and that they were not interested in the study (n=3). The respondents' ages ranged from 23 to 58 years with a mean of 32 years and a mode of 27 years. Most pharmacists had less than 6 years of practice and mean of 8 years of practice.

Table 1: Demographic distribution of study participants

Variable	Frequency	Percentage
Age:		
< 30 years	54	48%
≥ 30 years	58	52%
Gender:		
Males	59	53%
Females	53	47%
Years of practice as a pharmacist:		
< 6 years	58	52%
6 - 14 years	32	29%
>14 years	22	19%
Location of pharmacy:		
CBD	29	25%
High Density	27	24%
Low Density	34	31%
Hospital	22	20%
Type of pharmacy setting:		
Independent	58	52%
Chain	35	31%
Hospital	19	17%

Key: CBD = Central Business District.

Knowledge on PrEP

Using the knowledge score of 9 or greater, 65 out of 112 pharmacists (58%) were knowledgeable about PrEP. There were no significant associations on pharmacists' knowledge by age, gender, years of experience and setting as shown in Table 2 below.

Table 2: Simple logistic regression of knowledge of ART for PrEP

Variable	Odds ratio of good knowledge	p-value	95% Confidence Interval
Age (years): < 30 vs. ≥ 30	1.4	0.4	0.7 – 3.1
Gender: Males vs. Females	0.8	0.5	0.4 – 1.7
Years of experience:			
< 7 years vs. ≥ 7 years	1.4	0.4	0.6 – 3.0
Setting:			
Independent vs. Chain	2.1	0.1	0.8 – 4.8
Independent vs. Hospital	1.8	0.2	0.7 – 4.8

Perception of PrEP

Most of the pharmacists disagreed that use of ARVs by healthy people will not lead to long term side effects (77%), whilst 17% agreed and 6% had a neutral opinion (mean perception score 2.02; standard deviation [sd] 1.230). Most pharmacists disagreed that long term use of monotherapy ARVs will not lead to resistance (84%), 12% agreed and 4% were neutral (mean perception score 1.71; sd 1.220). The majority of pharmacists disagreed that people will not abandon safe sex practices if PrEP is available (73%), 22% agreed and 5% were neutral (mean perception score 2.30; sd 1.420). Most pharmacists agreed that availability of PrEP would empower women (62%), whilst 21% disagreed and 17% were neutral (mean perception score 3.58; sd 1.340). The majority of pharmacists (73%) agreed that even if PrEP is made available, its cost would be a significant barrier for those who need it, whilst 17% disagreed and 10% were neutral (mean perception score 2.14; sd 1.265). Thus most pharmacists had a negative perception towards PrEP (total mean perception score 11.75; sd 3.215).

There was evidence of a relationship between age and the perception that long term use of monotherapy ARVs will not lead to resistance. There were no significant associations on pharmacists' perception by gender, years of experience and setting.

Willingness to adopt future implementation

All pharmacists responded that they had control over the type of drugs stocked in the pharmacy. If PrEP is to be approved in Zimbabwe, 105 pharmacists (94%) were willing to stock PrEP in their pharmacies. If PrEP was a Pharmacist Initiated Medicine (PIM), 97 pharmacists (87%) said they would dispense it to HIV-negative clients as an HIV prevention method and 15 pharmacists (13%) responded they would not dispense it. The chi-test showed no association of dispensing PrEP if it was a PIM to pharmacy setting (p=0.897), age (p=0.810), gender (p=0.616) or location (p=0.689). There was no association of stocking PrEP to pharmacy setting (p=0.625), age (p=0.430), location (p=0.775) or gender (p=0.807).

A total of 71 pharmacists (63%) stated that future implementation of PrEP in Zimbabwe would be a problem whilst 41 pharmacists (37%) disagreed. The main reasons given by the pharmacists who thought that future implementation would be a problem included that the cost of the drugs would be too high and not affordable to many patients (n=23), the drugs would not be easily accessible (n=14), use of PrEP might lead to increased promiscuity and distort all measures to reduce HIV transmission (n=12) and that the financial/ economic instability of country would make it difficult to implement PrEP (n=10).

DISCUSSION

The response rate for this study of 90% was high comparing with a similar study done by Tripathi et al. which had a response rate of 75% [10]. The negative perceptions and concerns of most pharmacists were similar to those of health care professionals in the study by Tripathi et al. The perception that use of ARVs as monotherapy in PrEP leads to resistance could have emanated from the fact that ARVs are preferably used as triple therapy for the treatment of HIV to prevent resistance [11]. The clinical trials testing Truvada® for PrEP only found resistance among participants who had unrecognized HIV infection at baseline and still enrolled in the studies to take Truvada® [12, 13].

Another cause for resistance to Truvada® in the PrEP clinical trials was seroconversion [14]. Thus, HIV acquired during PrEP has the potential to be resistant to the agents used (tenofovir plus emtricitabine). Healthcare workers should only initiate PrEP to individuals at high risk of acquiring HIV and must reinforce the need for high levels of adherence. HIV tests are also mandatory at every monthly visit before another dose of PrEP is given.

Most pharmacists were concerned about safety of the PrEP. The randomized clinical trials conducted have shown use of Truvada® in PrEP to be safe [12-15]. Although randomized clinical trials are the "gold standard" in terms of research design, they have the disadvantage that they are conducted under artificial environments [16]. Thus there is still need for monitoring patients receiving PrEP for side effects, especially renal disease and reduction in bone mineral density which are associated with tenofovir use [17]. The majority of pharmacists had the perception that availability of PrEP could lead people to abandon safe sex practices such as consistent condom use. In Zimbabwe, use of condoms is not under the control of women and women have problems negotiating consistent condom use with their partners [18]. In addition, in Zimbabwe both men and women have reported low use of condoms [19]. Thus it remains unclear whether use of PrEP will cause behavior modification leading to less safe sex practices.

Most of the pharmacists had the perception that availability of PrEP would empower women who are unable to negotiate consistent condom use with their partners. A study conducted by Moon et al. in Zimbabwe to assess the acceptability of vaginal microbicides among key informants revealed that most men were concerned that women would be able to use these products without their consent or knowledge [6]. In the Zimbabwean culture, men like to be consulted in reproductive health issues [6], and this strikes a dilemma on the use of PrEP among vulnerable women who are at high risk of HIV through the partner.

More than half of the pharmacists reported that PrEP is teratogenic if taken by pregnant women. Whilst women who fell pregnant in the PrEP clinical trials were promptly discontinued from using Truvada® [14, 15] published literature on use of Truvada® in animal and clinical studies showed Truvada® to be safe for use in pregnancy. The WHO recently approved use of tenofovir plus emtricitabine (or lamivudine) plus efavirenz as first line treatment for HIV positive pregnant women [20]. Thus this new evidence suggests that use of Truvada® in pregnant women is safe and not teratogenic.

If PrEP is to be successfully implemented in Zimbabwe, the government should address the concerns raised by the pharmacists. Cost was cited as the major hindrance. The price for a 30-day supply of Truvada® [Gilead Sciences] in the private sector in Zimbabwe ranges from USD 50-70. Almost all the healthcare providers in Southern USA recognized cost as a major barrier to the implementation of PrEP [10]. On 02 August 2012, Gilead Sciences entered into an agreement with three Indian pharmaceutical companies (Mylan Laboratories, Ranbaxy Laboratories Limited and Strides Arcolab) in order to promote access to high quality, low-cost generic versions of emtricitabine in developing countries [21]. This agreement that Gilead Sciences entered with the Indian pharmaceutical companies will improve affordability of Truvada® in developing countries.

There are some limitations to this study. The study population could have been broadened to include pharmacists from other sectors like academia, regulatory, pharmaceutical industry and research. As a result of the sampling frame used, the study results are only representative of the sample studied and cannot be generalized to the rest of the population. There was also a possibility of self-selection bias. It may be assumed that individuals who refused to participate in the study are generally different from those who responded. Thus individuals who were interested in PrEP were more likely to respond, presenting an overestimation of providers' knowledge, positive attitude and willingness to adopt PrEP in Zimbabwe.

CONCLUSION

The study findings showed that most pharmacists were knowledgeable about PrEP although there were no significant

differences in knowledge by age, gender or setting. The majority of pharmacists were willing to adopt future implementation of PrEP in Zimbabwe and most of them suggested that PrEP be classified as Pharmacist Initiated Medicines. The cost of PrEP was cited as the most probable hindrance to future implementation in Zimbabwe. On perceptions, drug resistance due to use of PrEP, safety of PrEP and long term adverse drug effects were of highest concern thus pharmacists supported the need for more research to determine the safety and efficacy of PrEP.

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