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Sánchez-Rubio Ferrández, Javier; Martínez Sesmero, José Manuel; Navarro Aznárez, Herminia; Fernández Espínola, Sergio; Escobar Rodríguez, Ismael; Ventura Cerdá, José Manuel; Group of Pharmaceutical Care for HIV+ Patients

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Perceptions about HIV pre-exposure prophylaxis among healthcare professionals in Spain (PERPPRES Study)

Percepción de los profesionales sanitarios sobre la profilaxis preexposición al VIH en España (Estudio PERPPRES)

Javier Sánchez-Rubio Ferrández
javier.sanchez@salud.madrid.org
Hospital Universitario de Getafe, España
José Manuel Martínez Sesmero
Complejo Hospitalario de Toledo, España
Herminia Navarro Aznárez
Hospital Universitario Miguel Servet, España
Sergio Fernández Espínola
Hospital de Antequera, España
Ismael Escobar Rodríguez
Hospital Universitario Infanta Leonor, España
José Manuel Ventura Cerdá
Therapeutic Positioning and Pharmacoeconomics, España
Group of Pharmaceutical Care for HIV+ Patients

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Abstract: *Objective:* To determine the level of support, knowledge and perceptions of pre-exposure prophylaxis (PrEP) by Infectious Disease Specialists and Hospital Pharmacists in Spain.

Methods: Cross-sectional study through an on-line 31-item survey (sociodemographical data, employment status/experience, knowledge of PrEP, use, identified barriers and economic issues). A univariate analysis was performed to evaluate the variables associated with support for PrEP, and compare the assessments by Specialists and Pharmacists.

The questions about support for PrEP and agreement with the indication approval were repeated after showing data from published studies. The significance of the change in the answers was analyzed using the McNemar Test.

Results: 211 questionnaires were received (80.1% from Phar- macists). 40.3% had low/no familiarity with PrEP (46.2% Pharmacists vs. 16.7% Physicians; p< 0.01). A 53.6% of them would support the use of PrEP (49.7% Pharmacists vs. 69% Physicians; p= 0.038). The minimum acceptable efficacy in order to support PrEP was 85.0 ± 15.5% (82.6 ± 12.1% by Physicians vs. 85.6 ± 15.0% by Pharmacists; p= 0.02).

The variables associated with support were: medical profession (OR= 2.26; 95%CI 1.1-4.6; p= 0.038) and lower demand for efficacy (difference= 10.5%; 95%CI 6.9 to 14.1; p< 0.001).

After receiving the information, there was an increase in their support for use and indication approval. Most participants (81.5%) did not support its reimbursement.

The main barriers identified were: an increase in risk behaviour (24.1%), increase in sexually transmitted diseases (19.0%), resistance (16.6%) and cost (16.0%).

Conclusions: More than half of participants were familiar with PrEP. The majority of them would support its use and the approval of the indication, but would not reimburse it. The use of PrEP in real practice is currently low.

Keywords: Pre-exposure prophylaxis, HIV, Spain.

Resumen: *Objetivo:* Determinar el grado de apoyo, conocimientos y percepciones respecto a la profilaxis preexposición (PrEP) de los médicos infectólogos y farmacéuticos hospitalarios en España.

Métodos: Estudio transversal mediante encuesta de 31 ítems (datos sociodemográficos, situación laboral/experiencia, conocimiento sobre PrEP, uso, opiniones, barreras detectadas y aspectos financieros). Se realizó un análisis univariante para evaluar las variables relacionadas con el apoyo a PrEP y comparar las valoraciones de médicos y farmacéuticos.

Las preguntas sobre apoyo a la PrEP y el acuerdo sobre aprobar la indicación se repitieron tras mostrar datos de estudios publicados. Se analizó la significación del cambio en la respuesta mediante la prueba de McNemar.

Resultados: Se recibieron 211 cuestionarios (80,1% farmacéuticos). El 40,3% estuvieron nada/poco familiarizados con la PrEP (46,2% farmacéuticos *vs.* 16,7% médicos; p< 0,01). El 53,6% apoyaría su uso (49,7% farmacéuticos *vs.* 69% médicos; p= 0,038).

La eficacia mínima considerada aceptable fue 85,0±15,5% (82,6±12,1% médicos *vs.* 85,6±15,0% farmacéuticos; p=0,02). Las variables relacionadas con el apoyo fueron: profesión médica (OR= 2,26 IC95% 1,1-4,6; p= 0,038) y menor exigencia de eficacia (diferencia 10,5% IC95% 6,9-14,1; p< 0,001).

Tras recibir la información, aumentaron el apoyo al uso y la aprobación. El 81,5% no apoyaron la financiación.

Las principales barreras señaladas fueron: aumento de conductas de riesgo (24,1%), aumento de enfermedades de transmisión sexual (19,0%), resistencias (16,6%) y coste (16,0%).

Conclusiones: Más de la mitad de los encuestados estaban familiarizados con la PrEP. La mayoría apoyaría su uso y la aprobación de la indicación, pero no la financiaría. El uso en la práctica real de la PrEP es escaso en la actualidad.

Palabras clave: Profilaxis preexposición, VIH, España.

Introduction

Infection by the Human Immunodeficiency Virus (HIV) is still a major health problem in our country. The most recent data on epidemiological monitoring for HIV and AIDS in Spain state that, regardless of the efforts made, there is still a high rate of newly diagnosed patients. Thus, there were 7.25 cases per 100,000 inhabitants in 2014, above the mean rate in the European Union and Western European countries.

The main transmission way is sexual, particularly among men who have sex with men (MSM). For this reason, without excluding other ways of transmission, it will be necessary to implement and reinforce effective actions to prevent the transmission through this way, adapting them to the circumstances [1].

The "Pre-exposure Prophylaxis" (PrEP) consists in the administration of antiretroviral drugs to non-infected individuals who present high exposure or risk of infection.

The concept of prophylaxis in order to reduce the risk of an infectious disease is well established; an example would be the chemoprophylaxis for malaria in travellers. The idea that PrEP could reduce the risk of HIV was based on the prevention of mother-to-child transmission of HIV through antiretroviral prophylaxis, and on the studies conducted on primates that showed that PrEP offered partial or complete protection against the infection [2].

The proof of concept test was obtained by evaluating the efficacy of the tenofovir 1% vaginal gel. However, regardless of the positive outcomes of the CAPRISA0043 clinical trial, two subsequent studies did not confirm the efficacy of the gel in reducing the rate of transmission [4,5.] Regarding the use of oral agents, clinical trials have been conducted mostly with daily administration of tenofovir/emtricitabine (TDF/FTC), though there are also studies on the administration of tenofovir only or the pericoital use of TDF/FTC. The reduction of the relative risk of transmission in these studies has ranged from 6 to 92% [6]. However, outcomes have been more consistent among patients with high levels of adherence [7], and therefore PrEP has become a strategy of great interest in the future fight against HIV infection.

However, PrEP implementation has just started, or is still under consideration; for the time being, until the EMA (European Medicines Agency) completes its evaluation, this use of antiretroviral medication has not been approved in our country. The future implementation of this type of prevention measures will undoubtedly require setting up an adequate care structure, with the collaboration of different healthcare agents.

The objective of the present study is to determine the current level of support, knowledge and perceptions about PrEP by Infectious Disease Specialists and Hospital Pharmacists in Spain.

Methods

A cross-sectional study was designed, using an anonymous "on-line" survey through the "Google Drive®" tool, including 31 items regarding sociodemographical data, employment status / experience, level of knowledge about PrEP, use, opinions, barriers detected for its implementation, and economic aspects. The survey was based on that conduced by Yoong D *et col* [8], and included dichotomous, multiple choice, and Likert-type questions (1=no agreement, and 5=high agreement). The questions asked are shown in Table 1. All questions required an obligatory answer, except the one about the cost considered acceptable. The questionnaire underwent a pilot test, where it was initially answered by a group of 4 Pharmacists in order to assess if it was clear and easy to understand.

Table 1

Model of survey used in the study.

17) Would you support the use of PrEP for individuals at high risk of HIV infection?
18) Do you think that the health authorities should APPROVE the indication for use of PrEP in our country?
19) Do you think that the health authorities should REIMBURSE the indication for use of PrEP in our country?
20) In a hypothetical scenario of approval of PrEP use, which do you think would be the best setting for PrEP dispensing?
21) Do you think that PrEP dispensing from the Hospital Pharmacy Units would be feasible with current resources?
22) Please state your level of agreement with the following statements; (1 = no agreement, to 5 = high agreement).
- PrEP is an interesting prevention strategy, and should be widely available as soon as possible.
- A widespread use of PrEP can reduce the incidence of HIV infections among the population.
- PrEP can lead to a medicalization of HIV prevention, and reduce the attention paid to other important prevention strategies.
- The benefit/risk ratio of PrEP is not adequate.
- Resources should be assigned to PrEP research.
- PrEP use should be paid for by the user.
- PrEP is a cost-effective strategy.

23) Which concerns / barriers do you find more relevant for the use of PrEP? (Choose three.)
- Low level of protection.
- Risk of developing resistances.
- Adverse effects and their severity.
- Potential increase in risk behaviours.
- Adherence to medication.
- Adherence to clinical follow-up.
- Cost / Source of funding.
- Increase in Sexually Transmitted Diseases.
- Lack of real-use data.
- Lack of time for education / determining adherence.

24) Which moment do you think would be a good opportunity to discuss the use of PrEP with the potential candidates to receive it?
25) What price (€/month) would seem adequate to you for a PrEP strategy to be reimbursed by the public health system?

The questions about the support for PrEP by the participants and their agreement with the approval for indication / reimbursement by health authorities were repeated after showing them a Summary Table with data of the studies published so far.

The Pharmacist participants were recruited through the Spanish Society of Hospital Pharmacy website, and from the e-mail list of the Group of Pharmaceutical Care for HIV+ Patients. Participants were asked to hand out the questionnaire to Infectious Disease Specialists in their hospitals.

The analysis included those answers collected from September, 1st to October, 1st, 2015.

The minimum sample size needed was estimated for the primary endpoint, that is to say, to estimate the proportion of participants who would support the use of PrEP of 50% with a 95% Confidence Level, 10% accuracy, and an expected loss rate of 5%. Therefore, the minimum sample size needed was estimated in 101 participants.

A descriptive and analytical univariate analysis was conducted through ChiSquare Test (qualitative variables), or Mann-Whitney's U Test (quantitative variables), in order to evaluate the potential variables associated with support for PrEP, as well as to compare the assessments

conducted by Physicians and Pharmacists with a 95% level of statistical significance. A multivariate analysis was additionally conducted, through logistical regression and using the Step-Forward Method (Likelihood Ratio), considering the variables with p<0.1 in the univariate analysis. The goodness-of-fit of the model was determined through the Hosmer-Lemeshow Test.

The significance of the change in the answer regarding support for its use, as well as for approval of its indication and reimbursement, was analyzed through Mc-Nemar Test, before and after receiving the information from the published data. The analyses were conducted using the SPSS statistical package, version 19.0.

Results

In total, 211 completed questionnaires were received, that were adequate for analysis. 80.1% (169) of participants were Pharmacists; of them 60.7% were female, and their age was (mean±SD) 39.6±10.1 years. Their mean experience with HIV patients was of 8.6±8.3 years. Regarding the employment status of the participants, the majority were hospital specialists (69.2%), followed by residents (17.0%), heads of department (9%), unemployed specialists (1.4%) and others (3.4%).

The distribution by autonomous communities was: Andalusia (13.7%), Aragon (4.7%), Asturias (0.5%), Cantabria (4.3%), Castille La Mancha (7.6%), Castille and León (2.4%), Catalonia (14.7%), Ceuta (0,5%), Community of Madrid (21.8%), Community of Valencia (9%), Extremadura (1.9%), Galicia (3.3%), Balearic Islands (3.3%), Canary Islands (1.9%), La Rioja (0.9%), Murcia (1.9%), Navarre (2.4%) and the Basque Country (5.2%).

Table 2 details the characteristics of the Physician and Pharmacist participants.

40.3% of them acknowledged that they had low / no familiarity with PrEP (46.2% for Pharmacists and 16.7% for Physicians; p< 0.01). Regarding their use of PreP, results are shown in Table 3.

The minimum efficacy in order to consider PrEP would be reasonable was 85.0±15.5% (82.6±12.1% for Physicians and 85.6±15.0% for Pharmacists; p= 0.02).

The only variables associated with support for PrEP in the univariate analysis were: medical profession (OR=2.26 CI 95% 1.1-4.6; p=0.038) and the lower demand in the minimum rate of efficacy acceptable (difference of 10.5% CI 95% 6.9-14.1; p<0.001). In the multivariate analysis, the influence of the minimum percentage of efficacy considered acceptable was sustained (p<0.001), and not the one regarding profession (p=0.087). There was an adequate fit according to the Hosmer-Lemeshow Test (p>0.05),

Before receiving the information regarding the published studies, 45% of the participants answered that they would support the use of PrEP (40.2 % of Pharmacists vs. 64.3% Physicians; p=0.009), and 45.5% of them were in favour of approving the indication (42.0% of

Pharmacists vs. 59.5% of Physicians; p=0,062); while 24.2% and 25.1% respectively had no formed opinion. Once they received the information, the percentages increased to 53.6% for support (49.7% of Pharmacists vs. 69.0% of Physicians; p=0.038) and 56.9% for approval of the indication (53.8 % of Pharmacists vs. 69% of Physicians; p=0.108), while the proportion of undecided respondents decreased to 13.7% and 13.3% respectively. The change was statistically significant according to the McNemar Test (p=0.007 and p<0.001 respectively).

Table 2
Characteristics of Physician and Pharmacist participants

Table 2. *Characteristics of Physician and Pharmacist participants*

	Physicians	Pharmacists
n	42	169
Age (mean±SD)	49.8±8.9	37.1±8.8
Gender (% of women)	31%	68%
Years of experience with HIV (mean±SD)	18.0±4.3	6.5±6.4
Professional with specialized knowledge of HIV	100%	83.4%
Employment status:		
Head of Department	21.4%	5.9%
Hospital Specialist	73.8%	68.1%
Resident	2.4%	20.7%
Unemployed Specialist	0%	1.8%
Other	2.4%	3.5%

Table 3
Data on PrEP Use and Perceptions

Table 3. *Data on PrEP Use and Perceptions*

Regarding PrEP...	Physicians	Pharmacists	Total	p*
Has been asked by some user	50.0%	24.3%	29.4%	p=0.02
Has suggested its use	28.6%	5.9%	10.4%	p<0.01
Has prescribed / dispensed it	9.5%	6.5%	7.1%	p=0.730
Knows patients who have used it	19%	13.0%	14.2%	p=0.451

* Chi-Square Test with a 95% statistical significance level.

* Chi-Square Test with a 95% statistical significance level.

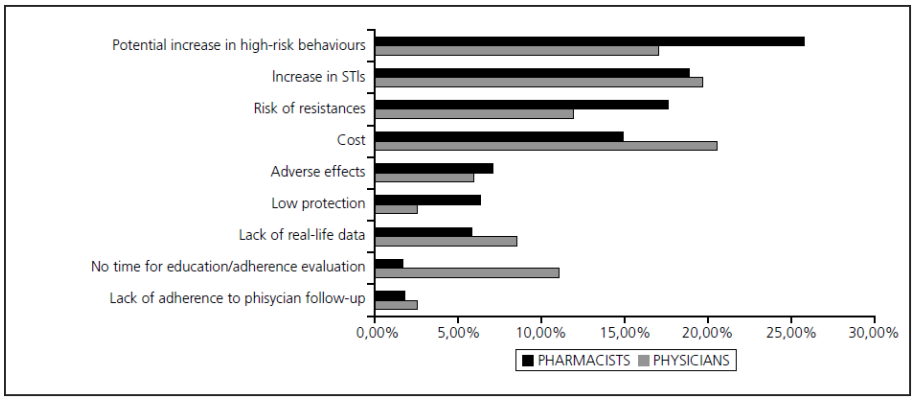

Figure 1
Main barriers detected by Physicians and Pharmacists

Regarding reimbursement, the majority of respondents (84.4%) did not agree with reimbursement for this strategy (84.6% of Pharmacists vs. 83.3% of Physicians; p=0.838). When they became aware of the data from the studies, the proportion stayed at 81.5% (81.1 % for Pharmacists vs. 83.3% for Physicians; p=0.907), and no significant change was observed (p=0.180).

The main barriers mentioned for its use were: a potential increase in high-risk behaviours (24.1%), increase in STIs (sexually transmitted infections) (19.0%), risk of resistances (16.6%) and its cost (16.0%). Figure 1 shows in detail the main barriers detected by Physicians and Pharmacists.

Regarding the best setting for dispensing PrEP in the hypothetical scenario of approval and reimbursement by the health authorities, the results appear in Table 4.

A 65.4% of participants considered that it would not be feasible to dispense PrEP from the Hospital Pharmacy Units, given their current resources (54.8% of Physicians and 68% of Pharmacists), while only 18% of them considered it possible (19% of Physicians and 17.8% of Pharmacists). However, both Physicians and Hospital Pharmacists considered that the Hospital Pharmacy Unit is the most adequate point of care for dispensing PrEP.

Figure 2 shows the degree of agreement by participants for certain claims about PrEP, according to the pre-established Likert Scale.

The question about the adequate price (€/month) so that a PrEP strategy could be reimbursed by the public health system was answered by 110 participants (52.1%); the mean price suggested was 95.4±87.2€ per month.

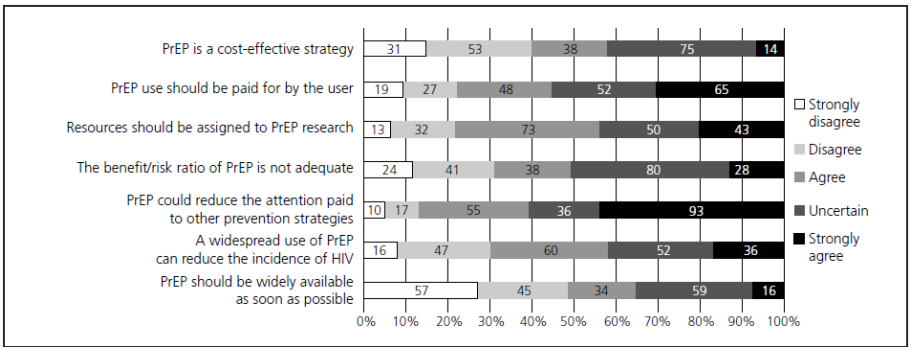

Figure 2
Level of agreement by participants with certain statements on PrEP.

Table 4

The most adequate setting for PrEP dispensing according to the participants

Table 4. *The most adequate setting for PrEP dispensing according to the participants*

	Total	Physicians	Pharmacists
Hospital Pharmacy	76.8%	64.3%	80.5%
Retail Pharmacy	11.9%	14.3%	9.7%
Primary Care	7.1%	14.3%	6.2%
NGOs/Patient associations	2.8%	0%	3.6%
STD centres	0.9%	4.7%	0%
Specific centres	0.5%	2.4%	0%

STD: Sexually Transmitted Diseases.

STD: Sexually Transmitted Diseases.

Discussion

The study presented has evaluated for the first time in our country the knowledge and perception by Physicians and Pharmacists about the HIV Pre-Exposure Prophylaxis. PrEP represents a strategy with increasing interest in the setting of the prevention of HIV transmission. For this reason, the *Center for Disease Control and Prevention* (CDC) recommends its use in risk groups [9], after this indication was approved for the tenofovir/emtricitabine combination in the United States on July, 2012 [10]. Though its use has been recently accepted in some European countries [11], in Spain there are still no drugs with this approved indication. However, as shown in our study, this application of the therapy in healthy individuals is already being conducted in certain patients, as off-label or non-regulated use.

The PERPPRES Study (Perception of Pre-Exposure Prophylaxis among Healthcare Professionals in Spain) has evaluated for the first time in our country the level of support for PrEP by Physicians and Pharmacists. Yoong D *and col*8 evaluated in 2013 the perception of Canadian Pharmacists regarding PrEP. In a similar way to these data presented, they found that the majority of participants supported their use; 69% of participants were in favour, compared with 49.7% in our country. However, this difference could be due to the higher number of Pharmacists not familiar with PrEP in our setting (46.2% vs. 6%).

Regarding Physicians, the majority would support its use, according to the outcomes obtained; the support is higher than among Pharmacists, and above the level of support obtained by other authors [12.]

On the other hand, it was observed that a higher knowledge of the published clinical trials led to a slight increase in the level of support by participants of the use of PrEP. Other studies have associated similarly the level of knowledge with the willingness to prescribe PrEP, pointing out that the education for potential providers of PrEP can be a key component for its future implementation [13].

The main barriers detected coincide in a qualitative way with those stated by other authors [14]; it was considered that the most relevant

barriers were those regarding the risk compensation / increase of STIs, potential development of resistances, and cost.

Risk compensation, that is to say, an increase in high-risk sexual behaviours, represents the Achilles' heel of prevention strategies15 and one of the main concerns when faced with a potential widespread use of PrEP. However, data from the published studies suggest that, even though it is high, the frequency of this type of practices is not encouraged by the use of PrEP. On the other hand, there are still not enough real-practice data; and even though no significant differences have been found, it is worth pointing out that some PrEP users have declared having a higher number of unprotected relationships; therefore, it is necessary to implement complementary educational strategies, as well as an adequate follow-up which, on the other hand, could be used as an opportunity for STI screening [16,17].

Regarding resistances, even though the studies demonstrate that their development during PrEP is low [18], these could be selected in those individuals that initiate it during an unknown acute infection. In any case, selected resistances seem to decay rapidly after drug cessation; it is still not known whether this fact could have any clinical relevance during antiretroviral treatment [19].

Another aspect that will undoubtedly be decisive in the potential implementation of PrEP is the cost associated to its use, and the potential reimbursement by public health systems. Even though the majority of participants were in favour of the use of PrEP and the approval of its indication, the majority opposed its reimbursement. Drugs used in PrEP represent a high cost; it has been estimated that the cost of its implementation for MSM at risk in Europe would be 9,100 million euros per year [20]. The price considered acceptable by participants indicates that this opinion could change if there was an eventual reduction in the price of the medications used, which allowed an escalation of the strategy to a significant group of population. In any case, as with any other healthcare technology, PrEP should be strictly analyzed from a cost-effectiveness point of view; because the cost of each infection prevented cannot be dismissed, if the chronic nature of this treatment is taken into account [21]. Finally, the majority of participants agreed that the Hospital Pharmacy Unit would be the most adequate setting for dispensing this strategy, if implemented; on the other hand, it includes drugs that in our country must be dispensed from these settings. However, current resources were not considered sufficient in order to undertake this task; it was pointed out that a structural improvement was required previous to PrEP implementation.

As a limitation, given the methodology of the study, it was not possible to know the rate of response achieved, or the number of centres involved; and, on the other hand, the recruitment of Physicians was lower. In the "ORIGEN" study, Morillo *et al* identified 92 centres registered in the Spanish Society of Hospital Pharmacy that were dispensing antiretroviral medication22, which shows that the number of Pharmacist participants

recruited can be highly representative of the professionals providing pharmaceutical care for HIV+ patients in our country.

On the other hand, the influence of the different political and social settings in the different Autonomous Communities was not taken into account.

Conclusions.

More than half of the participants were familiar with PrEP; this knowledge was higher among Physicians. The majority would support the use of PrEP and the approval of its indication; while only a low proportion of them would be in favour of its reimbursement. In a hypothetical scenario of approval and reimbursement, the majority of respondents considered that Hospital Pharmacy Units would be the most adequate setting for its dispensing. Currently there is a low use of PrEP in real practice in our country.

Bibliography

1. Vigilancia epidemiológica del VIH y sida en España. Actualización 30 de junio de 2015. Sistema de información sobre nuevos diagnósticos de VIH. Registro nacional de casos de sida. Dirección general de salud pública, calidad e innovación. Sistemas autonómicos de vigilancia epidemiológica. Centro nacional de epidemiología.
2. Baeten JM, Haberer JE, Liu AY, Sista N. Preexposure prophylaxis for HIV prevention: where have we been and where are we going? J Acquir Immune Defic Syndr. 2013 Jul;63 Suppl 2:S122-9.
3. Abdool Karim Q, Abdool Karim SS, Frohlich JA, Grobler AC, Baxter C, Mansoor LE, et al. CAPRISA 004 trial Group. Effectiveness and safety of tenofovir gel, an antiretroviral microbicide, for the prevention of HIV infection in women. Science. 2010 Sep 3;329(5996):1168-74.
4. Marrazzo JM, Ramjee G, Richardson BA, Gomez K, Mgodi N, Nair G, et al. VOICE Study Team.Tenofovir-based preexposure prophylaxis for HIV infection among African women. N Engl J Med. 2015 Feb 5;372(6):509-18.
5. Rees H, Delany-Moretlwe, Lombard C, Baron D, Panchia R, Myer L et al.. FACTS 001: a multi-centred phase III randomised, double-blind, placebo controlled trial of pericoital tenofovir 1% gel for HIV prevention in women. CROI 2015.
6. Spinner CD, Boesecke C, Zink A, Jessen H, Stellbrink HJ, Rockstroh JK, et al. HIV pre-exposure prophylaxis (PrEP): a review of current knowledge of oral systemic HIV PrEP in humans. Infection. 2016;44(2):151-8.
7. Marcus JL, Buisker T, Horvath T, Amico KR, Fuchs JD, Buchbinder SP et al. Helping our patients take HIV pre-exposure prophylaxis (PrEP): a systematic review of adherence interventions. HIV Med. 2014 Aug;15(7):385-95.
8. Yoong D, Naccarato M, Sharma M, Wilton J, Senn H, Tan DH. Preparing for pre-exposure prophylaxis: perceptions and readiness of Canadian

pharmacists for the implementation of HIV pre-exposure prophylaxis. Int J STD AIDS. 2016;27(8):608-16.

9. US Public Health Service. Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guideline. [citado Diciembre 2015]. Disponible en: http://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf
10. FDA. Truvada® (emtricitabine/tenofovir disoproxil fumarate) Full prescribing information. [Cited December]. Available from: http://www.accessdata.fda.gov/drugsatfda_docs/label/2012/021752s030lbl.pdf
11. Agence nationale de sécurité du médicament et des produits de santé (ANSM). Recommandation temporaire d'utilisation (RTU) Truvada (association fixe emtricitabine / fumarate de tenofovir disoproxil) 200 / 245 mg, comprimé pelliculé. Protocole de suivi des personnes traitees par truvada pour une prophylaxie pre-exposition au vih. 25 November 2015. [Cited January 2016]. Available from: http://ansm.sante.fr
12. Sharma M, Wilton J, Senn H, Fowler S, Tan DH. Preparing for PrEP: perceptions and readiness of canadian physicians for the imple-mentation of HIV pre-exposure prophylaxis. PLoS One. 2014 Aug 18;9(8):e105283. doi: 10.1371/journal.pone.0105283. eCollec- tion 2014.
13. Blumenthal J, Jain S, Krakower D, Sun X, Young J, Mayer K, et al. Knowledge is Power! Increased Provider Knowledge Scores Regarding Pre-exposure Prophylaxis (PrEP) are Associated with Higher Rates of PrEP Prescription and Future Intent to Prescribe PrEP. AIDS Behav. 2015 May;19(5):802-10.
14. Krakower D, Ware N, Mitty JA, Maloney K, Mayer KH. HIV providers' perceived barriers and facilitators to implementing pre-exposure prophylaxis in care settings: a qualitative study. AIDS Behav. 2014 Sep;18(9):1712-21.
15. Cassell MM, Halperin DT, Shelton JD, Stanton D. Risk compensation: the Achilles' heel of innovations in HIV prevention? BMJ. 2006 Mar 11;332(7541):605-7.
16. Marcus JL, Glidden DV, Mayer KH, Liu AY, Buchbinder SP, Amico KR, et al. No evidence of sexual risk compensation in the iPrEx trial of daily oral HIV preexposure prophylaxis. PLoS One. 2013 Dec 18;8(12):e81997. doi: 10.1371/journal.pone.0081997. eCollection 2013.
17. Scott HM, Klausner JD. Sexually transmitted infections and preexposure prophylaxis: challenges and opportunities among men who have sex with men in the US. AIDS Res Ther. 2016 Jan 19;13:5. doi: 10.1186/s12981-016-0089-8. eCollection 2016
18. Molina JM, Pintado C, Gatey C, Ponscarme D, Charbonneau P, Loze B. Challenges and opportunities for oral pre-exposure prophylaxis in the prevention of HIV infection: where are we in Europe? BMC Med. 2013; 11: 186. Published online 2013 August 23. doi: 10.1186/1741-7015-11-186.
19. Weis JF, Baeten JM, McCoy CO, Warth C, Donnell D, Thomas KK,et al. Preexposure prophylaxis-selected drug resistance decays rapidly after drug cessation. AIDS. 2016 Jan 2;30(1):31-5.
20. Kenyon CR, Osbak K. How many MSM in Europe could benefit from PrEP--a 9 billion Euro question? Int J STD AIDS. 2015 Nov;26(13):988-90.

21. Sánchez-Rubio Ferrández J, Martínez Sesmero JM. Profilaxis preexposición al vih: ¿un nuevo paradigma de prevención? Farm Hosp 2016 ;40(3):219-24.

22. Morillo-Verdugo R, Jiménez-Galán R, Ibarra Barrueta O, Martín Conde M, Margusino Framinan L, Illaro Uranga A. Situación actual de la estructura, procesos y resultados de la Atención Farmacéutica al paciente VIH en España. Proyecto origen. Farm Hosp. 2014; 38(2):89-99.