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Infectious Disorders – Drug Targets, **2016,** *16,* **1-5**

RESEARCH ARTICLE

Adherence to Antiretroviral Therapy and Tuberculosis Treatment in a Prison of Tehran, Iran

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Abstract: ***Background*:** The human immune system can be impaired due to lack of adherence to treatment among HIV positive patients. This is reflected in lower levels of CD4 count and incomplete viral suppression leading to the disease's progression and increased risks of opportunistic infections. Little is known about adherence to antiretroviral therapy (ART) and Tuberculosis (TB) treatment and barriers to ART adherence faced by prisoners. Therefore, we conducted a study to evaluate adherence to ART, treatment of latent TB infection (LTBI), and TB treatment and barriers of ART adherence in the Great Tehran Prison in 2014.

***Materials and Methods*:** We conducted a study to evaluate adherence to ART, latent TB infection treatment, and TB treatment via Directly Observed Therapy (DOT) among HIV positive patients in the Great Tehran Prison in 2014. Furthermore, we examined the barriers of adherence to ART through focus group discussions (FGDs) with 22 people living with HIV in the prison.

***Results*:** The mean of adherence to ART, latent TB infection treatment, and TB treatment were 93.3%, 92.7% and 93.3%, respectively. Addiction, negative drug reactions, bad experiences with staffs, and psychosocial and nutritional problems were cited as the most common barriers to adherence.

***Conclusion*:** It is recommended to implement DOT for ART in Iranian prisons. In addition, through removing the barriers and implementation of DOT for ART, HIV positive prisoners can achieve a complete adherence.

ARTICLE HISTORY

Received: October 12, 2015
Revised: May 28, 2016
Accepted: May 30, 2016

DOI:
10.2174/1871526516666160616111308

Keywords: Adherence, Barriers, Directly Observed Therapy, HIV, Prison, Treatment, Tuberculosis.

INTRODUCTION

HIV and Tuberculosis (TB) are the most important infectious diseases and major health problems in all prisons around the world. Strict adherence to antiretroviral therapy (ART) and TB treatment is required for saving lives and preventing the onset, expansion, and transmission of drug-resistance strains [1].

Most importantly, since ART plays a substantial role in the prevention of HIV transmission, to

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1871-5265/16 $58.00+.00

assess adherence rates and barriers to ART adherence in HIV positive patients is of great importance. The human immune system can be impaired due to lack of adherence to treatment among patients. This is reflected in lower levels of CD4 count and incomplete viral suppression leading to disease progression and increased risks of opportunistic infections. The reasons influencing the adherence to ART are similar in the society and prisons. Adherence is influenced by different behavioral, social, and economic factors. The most important ones include: the lack of belief in the effectiveness of medications, types of relationship between patient and physician, side effects of medications especially for efavirenz, drug interactions between some antiretroviral (ARV) medications and methadone, opium and opium-like drugs, tendency to hide taking medications because of fear of people's stigma especially family and friends, isolation from society, misbehavior of staffs toward prisoners, financial problems (traveling costs), laboratory tests and hospitalization, fear of losing job, psychological problems (like depression, disappointment, alcohol and drug use among men), difficulties in taking medications, inappropriate nutritional quality due to the lack of access to sufficient food, forgetting to take medications, educational status, low confidence in healthcare services, lack of simple facilities changes in HIV treatment programs, and homelessness [2-5].

Therefore, we conducted a study to evaluate adherence to ART, treatment of latent TB infection and TB treatment and barriers of ART adherence in the Great Tehran Prison in 2014.

MATERIALS AND METHODS

We conducted the study to evaluate adherence to ART, treatment of latent TB infection (LTBI), and TB treatment by Directly Observed Therapy (DOT) in the Great Tehran Prison in 2014.

A number of cases taking ART, and treatments for LTBI and TB in each month were evaluated to access adherence, a total of seventeen, twenty and eight patients were randomly selected from April 21 to May 21 in 2014 and received ART, LTBI and TB treatments, respectively. The treatment procedures were carried out *via* DOT. The patients were referred to health clinic reception of the prison to receive anti-TB and antiretroviral drugs every morning and antiretroviral drugs every night under direct observation.

Furthermore, the barriers of adherence to antiretroviral therapy were examined through focus group discussions (FGDs) with 22 people living with HIV in the prison. The male participants ranged in age from 26 to 57 years old and 17 persons (77.3%) among 22 patients had a history of injection drug use. The subjects were divided into two groups in which a group was adherent to ART and the other was not.

Institutional review board (IRB) of Tehran University of Medical Sciences approved the study protocol.

RESULTS

The mean of adherence to ART, latent TB infection treatment, and TB treatment were 93.3%, 92.7% and 93.3%, respectively.

In total, Table **1** shows the results of the FGDs classified based on the type of barriers. As one major finding, the study indicated the positive impact of having a good and friendly relationship with the therapist and trust in healthcare staff; indeed, encouragement of prisoners to continue treatment plans, providing necessary training for all prisoners, psychological and economic support from families and communities and avoiding stigmatization and rejection are effective in strict adherence to antiretroviral therapy. The participants pointed out the negative impact of inadequate drug dependence treatment services on ART adherence in the prison setting. Most importantly, some participants in FDGs were aware of drug resistance due to their non adherence to medicines.

DISCUSSION

Adherence to antiretroviral therapy was about 93% in our study rendering as being acceptable. This was more than that was observed in the society [6]; however, it needs to be improved. It was previously viewed that ARV can perform better for HIV-infected prisoners than for discharged persons. In these studies, discharging patients from a prison had a negative effect on viral and immunologic conditions of HIV positive patients [7, 8].

Among the most common and significant barriers to ART adherence in people living with HIV

Table 1. Possible barriers of ART adherence among HIV positive patients in the prison setting according to the participants in the FGDs, 2014.

Addiction and Medications	- Lack of access to ARV drugs - Adverse effects of ARVs (in particular, efavirenz) -Symptoms of withdrawal in patients taking efavirenz and methadone simultaneously - Distrust of effectiveness of ARVs - Additive effect of ARVs and anti- tuberculosis medicines on methadone clearance - Taking multiple pills everyday - Active addiction and injecting drug use
Prison Staffs' Behaviors	- Poor cooperation by nurses for ARVs delivery - Poor cooperation to transfer HIV positive patients from the prison wards to the clinic - Misbehavior by some healthcare providers and other staffs - Failure to transfer patients to the clinic as to impose penalty - Mandatory prison breaks even for HIV positive patients (especially in cold weather) - Lack of attention to prescription drugs and supplements, like vitamins
Psychosocial Problems	- Depression, anxiety and disappointment - HIV/AIDS related stigma and discrimination - Concealing the disease from families due to fear of rejection - Lack of family support - Poor support from prisons authorities - Inadequate psychosocial support - Absence of tendency to psychiatric visits
Nutritional Problems	- Unqualified meals - Lack of supplements such as vitamins and minerals
Others	- Forgetfulness - Occasionally non-planned transferring of patients to other prisons, units or wards - Transferring patients to the court or a police station - Long distance between some prison wards and the voluntary counseling and testing (VCT) center in the prison - Inadequate education and awareness about HIV and ARVs - Poor socio-economic status (*e.g.* lack of money for purchasing meals) - Irregular supply of methadone in the prison

are the fear of side effects with medications (especially efavirenz), and also the interaction between efavirenz and methadone, opium or opioid drugs, which increases their metabolism. Side effects such as body aches, nausea, rashes, regimen complexity, and multiple pills are all important to strict adherence to treatment [2, 9, 10]. Therefore, it would be necessary to manage medication side effects, explain benefits of HIV treatments for patients, and encourage them to continue therapy so as to prevent disease progression to virus transmission and/or drug resistance.

As suggested by various studies, stigma and despicable behavior with prisoners or non-prisoners infected by HIV in the community may lead to conceal the disease, avoid using drugs, and refuse taking medications. Since stigma and discrimination are totally associated with attitudes and knowledge, it is necessary to provide adequate training at the community and prison levels, focused on changing wrong attitudes and beliefs [2, 3, 5, 10, 11]. Our FGDs suggest that unfavorable conditions of prisons, bad behavior by staff, lack of support and mandatory prison breaks especially in cold weather as well as low quality of food materials are all among the negative factors that may play a role in reduced adherence to ART. A study in Namibia prison, for example, showed that the lack of simple possibilities, lack of adequate meals, treatment changes, violence, bad behavior by prison staffs, and stigmatization lead to discouragement and diminished motivation for treatment [3].

Through a research in Greece, age, level of education, economic status, alcohol and drug abuse, depression, stigma, isolation from society, and lack of trust for prison staff have been cited as barriers of adherence [8]. Also, drug abuse, homelessness, psychological problems and unfriendly relations with healthcare personnel are found among women inmates [4].

To forget taking medications may occur as a result of drug abuse, intellectual preoccupations, and changes in daily plans. Depression, absence of morale and motivation, hopelessness to recovery, and thinking about death are also negative factors [3, 4, 12, 13].

Lack of proper treatment for drug addiction and mental illness, reduced motivation, poor adherence to the recommendations, homelessness which causes a lot of movement and social instability, unemployment, inability to meet basic needs, and multiple concurrent diseases that often result in difficulty in treatment and drug interactions are mentioned as the major causes of non-adherence to treatment after being released from the prison [14].

For the first time, we delivered ART as DOT in an Iranian prison. DOT seems to be an effective factor in adherence to ARV. In addition, by removing barriers and implementation of DOT for ART, HIV positive prisoners can achieve strict adherence.

CONCLUSION

It is recommended to employ DOT for antiretroviral therapy in Iranian prisons. It seems that increased adherence to antiretroviral drugs requires improving quality in healthcare services for prisons, continuous training with prisoners and staff, eliminating stigma and discrimination, developing friendly communication, use of peer education, providing regular programs for methadone maintenance treatment (MMT), promoting family and social supports, motivation and encouragement.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

ACKNOWLEDGEMENTS

This study was a part of a PhD dissertation supported by Tehran University of Medical Sciences (Grant No. 9021598014). This project was founded mainly by the World Health Organization office in Iran (resource of fund from Global Found to fight TB, AIDS and Malaria in prison organization) to implement activities related to TB control and supplementary fund was provided by United Nations Office on Drugs and Crime (UNODC) in Iran to implement activities related to HIV. We also thank all staffs in the Great Tehran Prison for their help.

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