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RESEARCH ARTICLE

Revision and Implementation of "Clinical Guideline for Tuberculosis and HIV in Prisons", Great Tehran Prison, Iran

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Abstract: ***Aim:*** To evaluate the feasibility of the revised "Clinical Guideline for HIV and TB" in the Great Tehran Prison during October 2013 to June 2014.

Methods*:* The guideline includes all aspects of HIV/TB diagnosis based on active case finding (ACF), treatment and care services. **Before the implementation,** a focus group discussion was conducted, and attended by experts on jail diseases. The objective was to identify defects and limitations of the guideline after the discussion, the guideline was revised.

The Great Tehran Prison contains three separate units; all prisoners are taken first to "reception and identification unit **(***quarantine)"* and then send to two housing units according to their legal status.

An HIV ACF strategy was employed in the quarantine, and two units through a voluntary provider-initiated HIV testing. Three staffs of the triangular clinic trained the prisoners about common routes of HIV transmission and the symptoms of TB in the *units*. In the *quarantine,* all prisoners were examined for all HIV-risk factors, HIV testing and symptoms of TB. In unit one, healthcare staff continued the ACF process, while in unit two, the trained prisoners were assigned as the healthcare communicators to proceed with caution the strategy. At this caring process, when the test result was positive, then the process of care, treatment and follow ups was initiated. Moreover, the use of *directly observed therapy* **(***DOTs***)** for antiretroviral therapy (ART) and TB was applied to the sick prisoners. There was also a follow-up caring for released prisoner to refer them to care and treatment services outside the prison.

Results: The guideline was implemented in the prison successfully.

Conclusion*:* **Regarding** feasibility of the guideline, the investigators of this study suggest that the guideline should be implemented in other prisons across the country.

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1. INTRODUCTION

Tuberculosis (TB) is a major public health challenge and the most common cause of death in many settings particularly in the prisons of developing countries [1, 2]. The rate of TB transmission in prisons is 11 to 81 times higher than the general population [2]. Based on "guidelines for control of tuberculosis in prisons", five main factors are described to the contribution of the spread of TB in prisons. *Prisons receive TB* through offenders who are with higher risks of developing infections due to their prior conditions, such as malnutrition, abuse of alcohol and other drugs, previous imprisonment and poor socioeconomic status. Moreover, *Prisons concentrate TB* due to overcrowding, poor ventilation and inadequate access to treatment and care. *Prisons disseminate TB* by individuals with undetected TB who are transferred between different sections and *Prisons make TB worse* because of being delayed diagnosis and incomplete treatment and finally *Prisoners export TB* to general population through close contacts with prison staffs and visitors, and also after being released [3].

TB infection control includes measurements with the aim of reducing the risk of TB transmission. The core element of such control plan is early identification of suspected patients and effective treatment [3].

In the recent years, a significant increase in the incidence of Pulmonary Tuberculosis (PTB) in prisons was reported both in the major industrialized countries and the developing countries [1, 4-8]. Large increases in rates of TB occurred by the HIV epidemic among intravenous drug users (IDU) in the prisons [9-13].

The rate of HIV infection among prisoners is much higher than the general population [3, 14, and 15]. Among Iranian population, imprisonment is one of the most frequent risk factors of HIV infection. In addition, HIV is the strongest risk factor for developing active TB of latent TB infection [14].

In Iran, the rate of TB incidence in prisons has been reported about ten times higher than the general population [16]. Likewise, HIV prevalence among prisoners in Iran is much higher than the general population. Estimated prevalence is about 1.4% (95%CI: %0.6-%2.2) in newest survey [17].

Due to the lack of practical guidelines for prisons in Iran, the main objective of this present study is to modify and implement the "Clinical Guideline for TB and HIV in Prisons" which is based on active case finding and to evaluate the feasibility of the revised guideline.

2. MATERIALS AND METHODS

2.1. Content of the Guideline

Guideline consists of different topics concerning TB, such as: TB active or passive case finding in prison, approving the active TB, treatment of active TB in prison, monitoring of TB treatment, drug interactions and adverse effects, diagnosis and treatment of latent TB in prison, patients training, control of TB transmission in prison, and patient follow up after releasing the offender. Likewise, HIV topics included HIV testing at prison administration and in units, consultation after HIV testing and subsequent confirmation, evaluation of starting antiretroviral therapy, synchronization of anti-retroviral therapy and TB medications in prison, preventive therapy with Co-Trimoxazole and Azithromycine, monitoring adverse reactions and drug interaction in antiretroviral therapy (ART), patient training, follow up after releasing from prison and finally evaluation and monitoring of the HIV programs.

2.2. Focus Group Discussion

A focus group discussion (FGD) was conducted on May 21st, 2013 with the purpose of identifying defects and limitation of the "Clinical Guideline for TB and HIV in Prisons". Fifteen people including officers of the prisons' health care services, experts on jail diseases, a prison governor, a prison physician, and infectious disease specialists along with the executive director and project expert of the Global Fund participated in the FGD. Since FGDs are qualitative approaches, a targeted sampling was applied to recruit participants with enough experience on the field of TB/HIV control in prisons.

At the beginning of the interview, the participants were asked to complete a questionnaire on their demographic characteristics. During the interview, main researcher of the project, with helping of an educated facilitator, checked the accuracy of their interpretations from participants' responses by using some questions. Moreover, re-

searchers carefully monitored non-verbal means of communication such as body language and facial expressions. Participants were asked to clarify their remarks with examples, if necessary. Each discussion was recorded with prior permission by the participant. Complete transcriptions of the interviews were also prepared. Main Criteria for judgment on qualitative research were credibility, dependency, conformability and transferability.

Interviews were analyzed through content analysis.

2.3. Setting

The Great Prison of Tehran is located outside the city of Tehran, with three separate units. All prisoners are first taken to "reception and identification unit **(***quarantine)"* and then send to two housing units according to their legal status.

2.4. Process of Implementing "Clinical Guideline for TB and HIV in Prisons"

2.4.1. Infrastructural Modification

As a first step, the prison governors who were responsible for the prison settings were convinced for implementation of intervention in TB/HIV control. Then, one of the healthcare staffs (known as the TB/HIV communicator) was assigned as charge of the TB/HIV control programs. A vehicle was also provided for healthcare staffs to transport samples. In addition, TB isolation rooms were standardized and verified and small boxes were supplied for sputum specimens and tubes of HIV tests. Anti-TB and antiretroviral medications were provided adequately.

Division of laboratory in the prison was asked to send the results of sputum smear and mycobacterium culture, western blot HIV test and ELISA screening regularly using the telephone and also in written documents. The prisoners' data registration system was launched and the reports were organized in the archive of unit three. An independent phone line was connected for the triangular clinic. One of the important challenges to implement the guideline was the short duration of imprisonment. This was solved to some extent through some regulated follow ups after releasing prisoners, and a daily list of patients transferred between different units provided for the health care staff. In total, 70 letters were sent to different parts of the prison to indicate serious problems and the ways to resolve them.

2.4.2. Training Sessions

Early TB/HIV case detection is necessary for TB and HIV infection control. Therefore, some training sessions were organized for different target groups in regards to specific roles they play in the implementation process of the "clinical guideline for TB and HIV in prisons". The training sessions were held from July 2013 to March 2014 (Table **1**).

2.4.3. TB and HIV Diagnosis

- *TB Active Case Finding:* TB active case finding was started from October 2013. In the quarantine unit of the prison, two health care staffs initiated the ACF process by holding training sessions for prisoners three times a week. They introduced suspected cases of TB to the triangular clinic of the prison. ACF was done in two housing units. In unit one, the healthcare staff continued the ACF process, while in unit two; the trained prisoners were assigned as the healthcare communicators to proceed the activity. The assigned persons were completely trained regarding to the ACF and HIV screening tests. The health communicators kept daily records of TB suspected cases and reported to the clinic.

Each health care staff was encouraged to receive a limited low amount of cash reward for TB or HIV case findings.

- *HIV Case Finding:* An HIV screening test program was also launched in October 2013. HIV rapid test (Trinity Biotech Uni-Gold ™ HIV; sensitivity and specificity of 100%) [18] was performed at the time of entrance. Quality control of the mentioned kit was performed each week according to national guideline [19]. The HIV case finding process continued in other units of the prison with two different approaches; Voluntary Provider-Initiated Testing and Voluntary Client-Initiated Testing. Prisoners were asked to identify different risk factors of HIV infection and given consultation. All people referred to the prison clinics were examined for the HIV infection if they had related risk factors. Once the result was negative, they were given required information regarding prevention and risky behaviors. On the contrary, when the test was positive, process of care, treatment and follow-ups were initiated. If the test results

Table 1. Topics of the training sessions for the target groups regarding their roles in the prison.

Target group	Role in the process of implementing guideline	Topics of training sessions
Health care staff (11 people)	Active and passive case finding	TB control programs Early identification Complete treatment Follow up Prevention TB case finding Passive case finding Active case finding (ACF) TB screening at the entry Persistent case finding ACF among HIV positive prisoners ACF among those with close contact with TB infected people Algorithm of TB Diagnosis Taking history Physical examination Sputum smear and culture Chest x-ray Implementing DOT* strategy Monitoring TB treatment Anti-TB and anti-retroviral therapy Identification of latent TB Providing care after being released from prison TB transmission control in prison HIV rapid test Consultation before and after HIV test Patient education regarding TB and HIV infection
Attorneys and health care communicators (56 people) and care providers (20 people)	Active and passive case finding	Importance of TB and HIV control in prisons Early TB identification TB clinical presentation Follow up Prevention Direct supervision on the treatment HIV testing guideline among prisoners Identification of latent TB in HIV positive patients Patient education regarding TB and HIV infection Referring people with high risk factors for voluntary HIV testing
Heads of prison's units and prison governor	Close cooperation	Importance of TB and HIV control in prisons
Prison employees (10 people)	Close cooperation	The whole process of implementing the guideline Cost-effectiveness of early identification and treatment of patients

*Directly Observed Therapy

Table 2. Registration and reporting forms and the related checklist for implementation of the guideline.

Line list number1: HIV and TB active case finding among new prisoners in quarantine
Line list number 2: HIV and TB active case finding among inward resident prisoners
Line list number 3: Rapid HIV testing of prisoners
Registration and following-up of antiretroviral therapy
Follow-up and evaluation of patient with suspected tuberculosis
Registration and following-up sputum samples
Follow-up after release/transfer
HIV and TB case finding (specialized for physician or the plan's observer)
HIV counseling and testing
Adherence to anti-tuberculosis and antiretroviral treatment
Registration and following-up of tests (ELISA, Western Blot and CD4)
Line list of counseling and HIV testing
Line list of patients under antiretroviral therapy
Line list of information about HIV positive prisoners
Inquiries of prisoners outside the prison
Line list of name of patients receiving anti-TB and antiretroviral therapy to deliver to healthcare reception
Monitoring and evaluation checklist

were inconclusive, the prison inmates were asked to get retested after two months.

- *TB and HIV treatment services*: Directly Observed Therapy (DOT) for TB was initiated on January 7th, 2014 and the antiretroviral Therapy (ART) plan was started on January 21th, 2014.
- *Follow-up after release from the prison:* All TB and HIV patients were followed-up after discharging from the prison. We introduced them to a healthcare network at nearest center of their residence, and emphasized both healthcare system and the patients to have adherence to treatment.

Briefly, the following figure shows the procedure of HIV/TB case finding, diagnosis and treatment in the Great Prison of Tehran with three different units. In unit one, TB/HIV communicator educated the prisoners about HIV risk factors and symptoms of TB, found suspected cases, completed line list of TB and HIV, and reported suspected cases to the triangular clinic as to further test and consultation. Accordingly, in unit two, a representative of prisoners assigned as the health care communicator was responsible for educating other prisoners, case finding, completing preliminary line lists, and introducing cases to the triangular clinic. In the quarantine prison or unit three, all newly-transferred prisoners were admitted. On admission time, a nurse completed the health care certificate and line lists; however, in the bands (housing units), TB and HIV communicators did the same activity, and finally all suspected cases were referred to the triangular clinic.

In the triangular clinic, consultation and testing were performed to diagnose TB and HIV positive patients as shown in Fig. (**1**). Patients were examined by a general practitioner and, if necessary, they were referred to an infectious disease specialist for further treatment. Moreover, the general practitioner submitted some orders to a clinics psychologist who was responsible for implementing orders, registration, monitoring of treatment and follow up activities after release.

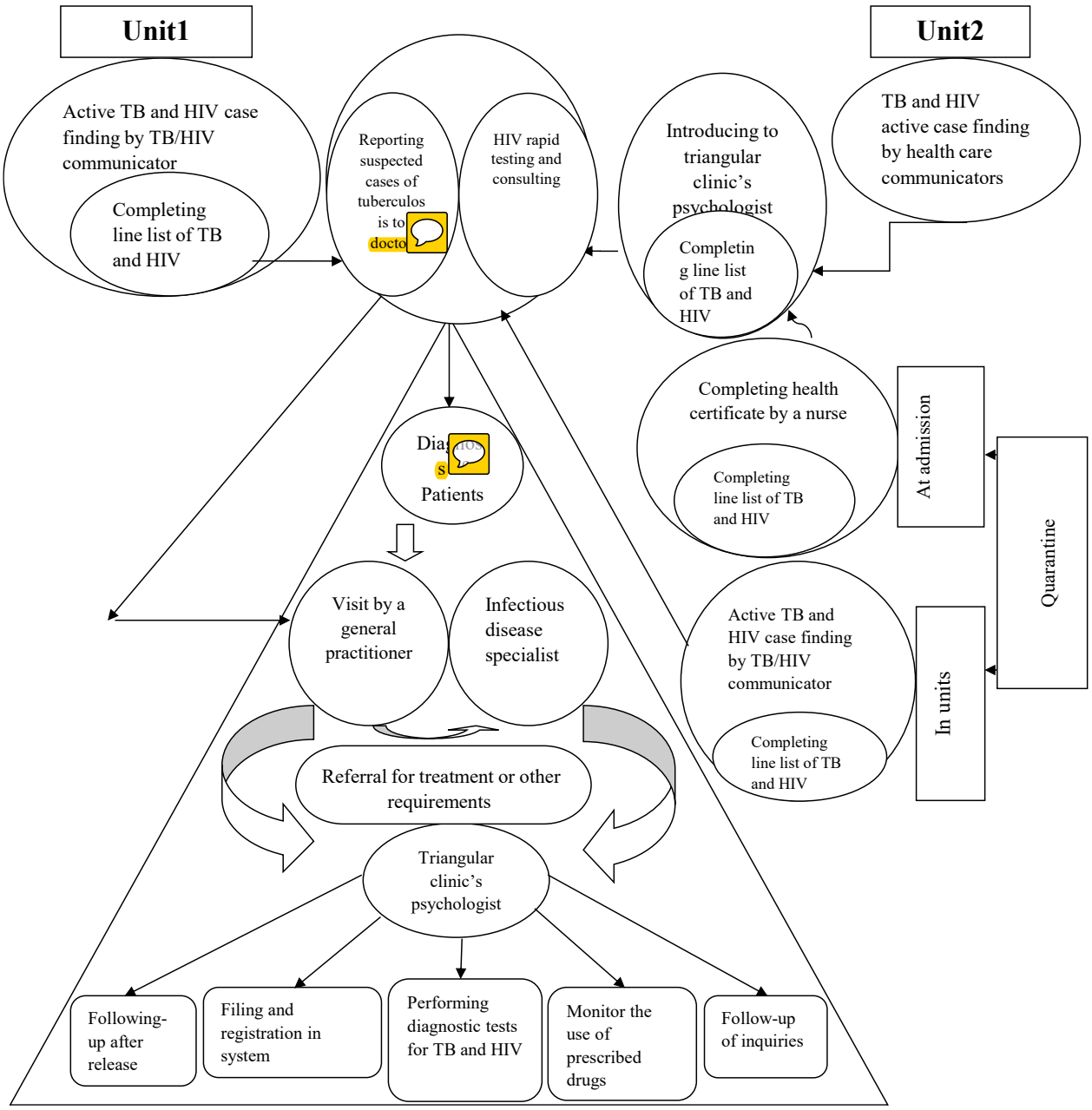

Fig. (1). Process of TB/HIV case finding, diagnosis and treatment in the Great Prison of Tehran

3. RESULTS

Table **3** presents the FDG results regarding the guideline.

Table **4** shows the result of three different types of case finding in each unit of the prison. Active case finding is responsible for 98.4% of case finding.

The clinical guideline was performed in the prison successfully. So, implementation of the guideline was feasible in the prison.

4. DISCUSSION

Many different types of researches have mentioned using active case finding strategy in prison setting, with no explanation about operational ways for ACF. In this study, we described essential steps to have successful implementation of ACF in the prison based on the guideline.

Early diagnosis of positive TB patients can potentially break the chain of transmission of Mycobacterium tuberculosis to contacts [20] likewise to HIV. Incubation period of HIV is longer and the

Table 3. Important trends should be implemented to make the guideline applicable based on the experts' idea.

In the prison
-Education about TB and encouragement for active case finding and medical examination (e.g. by banners)
-Encouragement for taking medications and put awarding system for patients
-Established isolated rooms for TB patients
-Use peer groups for education and active case finding
Out of the prison
-Established a registry system and follow up the TB patients
-Obtaining prisoners' address before and after imprisonment
-Counseling and training patients about TB and HIV
-Communication with patient's family
-Introduction some healthcare centers to released prisoners
-Dedicating some advantages through prisoner supporting associations or healthcare centers

Table 4 Prisoners' distribution based on type and place of case finding in the Great Tehran Prison.

Place	Type of case finding*	Number	Percent
Quarantine	Active	1452	50.77
	Educationally active	335	11.71
	Passive	9	0.31
Type 1	Educationally active	521	18.22
	Passive	34	1.19
Type 2	Active	507	17.73
	Passive	2	0.07

delay is more. So we should choose a faster and more efficient way to find suspected cases between prisoners and general population. ACF can be employed as a supplementary approach to curtail diagnostic delay in high TB burden settings [20]. In this study, we used scientifically active case finding by conducting training sessions for prisoners. Training sessions were held by health care staffs or health communicators about TB symptoms and HIV risk factors to find TB/HIV suspected prisoners. By using this method, we could find 2815 prisoners who had HIV related behaviors and/or TB suspected symptoms.

An active case-finding survey in North Gondar Prison was carried out and a total of 250 prisoners were screened, among these, 26 (10.4%) prisoners were found to have TB. All the inmates who participated in the study volunteered for HIV testing and a total of 19 (7.6%) inmates were found to be reactive for the HIV antibody test amongst of which 9 (47.4%) had TB co-infection. The prevalence of HIV infection in the TB infected inmates was found to be 34.6% (9/26) [10].

According to one study in Malawi, the researchers used active case finding survey to investigate the rate of pulmonary tuberculosis in a large prison. Nine hundred fourteen (70%) of 1315 prisoners were screened [11]. Forty seven (5%) screened prisoners had pulmonary tuberculosis [21].

In another study from Zambia mass screening was performed by trained lay prison personnel, inmate peer educators and members of the local neighborhood health committees and could successfully screen prisoners [22]. Moreover, in Hong Kong for TB screening of long-stay prisoners, CXR screening, clinical examination, sputum bacteriology and serial CXR were done for those with abnormalities in CXR screening [23].

Some studies screened newly admitted prisoners for TB symptoms [10, 22, 24] in line with our study. In a study from Quebec to assess HIV prevalence, inmates were asked to participate in an anonymous survey concerning HIV infection. Volunteers answered a questionnaire and provided a saliva sample during a meeting with an interviewer [25] similar the way of study in Glenochil prison [26].

Due to the feasibility of the clinical guideline as a pilot project in the Great Tehran Prison, we can conclude that this guideline is an applicable and effective intervention tool. Therefore, it is suggested first to follow the implementation of this guideline prisons in Tehran and then within the whole country for improving the performance of triangular clinics in case finding and service delivery, which helps remarkably for detecting and controlling of TB/HIV prevalence in the country.

Limitations of this work include: the rapid transferring of the patients between different units cause difficulties in screening, diagnosis, testing, treatment and follow-ups. In addition, some prisoners with high-risk behaviors related to HIV and positive rapid diagnostic test were released from the prison before the confirmatory tests (ELISA, Western blot) completed. As the main index for being HIV positive approved by the ministry of health is western blot test, we faced some serious problems to follow-up those patients outside the prison.

The method used in this study provides significant opportunities to detect and follow up the treatment of HIV positive people and TB patients. The expansion of this method in other prisons in the country can significantly enhance the quality of service presentation. The application of active service presentation seems to be piloted for other diseases, and it can be developed in other prisons of the country, if performed successfully.

SUPPORTIVE FOUNDATIONS

This project was founded mainly by WHO 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 UNODC office in Iran to implement activities related to HIV.

INSTITUTIONAL REVIEW BOARD STATEMENT

The study was reviewed and approved by institutional review board (IRB) of Tehran University of Medical Sciences**.**

CLINICAL TRIAL REGISTRATION STATEMENT

This study is registered at http://research.tums.ac.ir/. The registration identification number is 9021598014.

INFORMED CONSENT STATEMENT

The prisoners provided verbal and written informed consent.

CONFLICT OF INTEREST

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

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