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Original Research

Treating Latent Tuberculosis Infection in Newly Arriving Refugees: An Advanced Practice Nurse Initiative at the University of Louisville Global Health Center

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Abstract

Background: A review of newly arriving refugees referred to the local health department for latent tuberculosis infection (LTBI) treatment during 2013-2015 revealed a treatment gap of 73%, supporting the need to identify new approaches to treat vulnerable populations and mirrored results in the literature.
Objectives: 1) Describe an advanced practice registered nurse (APRN) led alternative approach to LTBI treatment in the refugee population; and 2) evaluate the impact of a 12-week regimen for LTBI on treatment acceptance, adherence and completion.
Methods: During the initial health screening visit, treatment options were provided for those identified with LTBI consisting of either a 12-week regimen requiring weekly directly observed therapy (DOT) or the traditional 9-month treatment.
Results: During March-December 2016, 50 refugees were referred and 24/50 were offered a 12-week regimen of Rifapentine and Isoniazid, administered with DOT. 23 of the 24 or 96% completed the entire treatment course.
Conclusions: The new LTBI clinic process resulted in an increase in treatment acceptance and completion compared with the historic rate of 27%.
Implications for Nursing: APRN initiatives such as this can result in positive benefits to patients and communities while serving to advance the nursing profession in all practice settings

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Background

The epidemiology of *Mycobacterium tuberculosis* infection continues to change with an increasing number of cases identified among those born outside the United States. LoBue and Mermin (2017), and Tsang and colleagues (2017) described the importance of identifying the presence of latent tuberculosis infection (LTBI) among the foreign-borne and the need to address both active and latent infection as part of a national public health strategy. The United States (US) has historically resettled approximately 100,000 refugees and other entrants each year (ORR, 2016). LTBI has been an area of concern at the University of Louisville Global Health Center (UL-GHC) due to the consistent rates of infection present among the resettling refugee population in Kentucky. According to data collected by the UL-GHC, overall rates of LTBI among the refugee and immigrant population resettling in Kentucky was 9% versus 5% among native-borne US citizens (Carrico, Goss, Wiemken, Bosson, Peyrani, Mattingly, et al., 2017). Reports demonstrating these rates of LTBI identified in refugees resettling in Kentucky over the course of the past five years can be found at http://globalhealth.center/rhp/state.php.

Using data available in the UL-GHC *Arriving Refugee Informatics SurVeillance and Epidemiology* (ARIVE) database, a significant disconnect between LTBI treatment recommendations and completion was identified. During January 2013-December 2014, 45 (8%) refugees were diagnosed with LTBI. All were referred to the local health department and provided appointments at dates and times agreeable to the refugee patient. Of those, 25/45 (56%) kept the health department appointment and 20/45 (44%) agreed to initiation of treatment for LTBI. Of those 20 who agreed to treatment, 12/20 (60%) completed treatment. That means of the 45 eligible for LTBI treatment, only 12/45 (27%) were treated resulting in a management gap of 73% (**Figure 1)**. Barriers to treatment data previously gathered by UL-GHC researchers included: 1) lack of knowledge about LTBI and its importance to general health, 2) possibility of reactivation of the disease, 3) need for treatment despite lack of recognizable symptoms, 4) language differences among providers, 5) work schedule conflicts, and 6) transportation to appointments as critical factors needing attention. Further, refugees cited difficulties in accessing medication as a barrier to initiation as well as completion of the recommended LTBI treatment. These findings were consistent with treatment barrier information identified in the literature (Colson, Franks, Sondengam, Hirsch-Moverman, & El-Sadr, 2010; Wieland, Weis, Yawn, Sullivan, Millington, Smith et al., 2012). The poor rate of treatment completion combined with the many barriers to treatment acceptance prompted a complete review of existing LTBI management practices for this vulnerable population. The result was implementation of a

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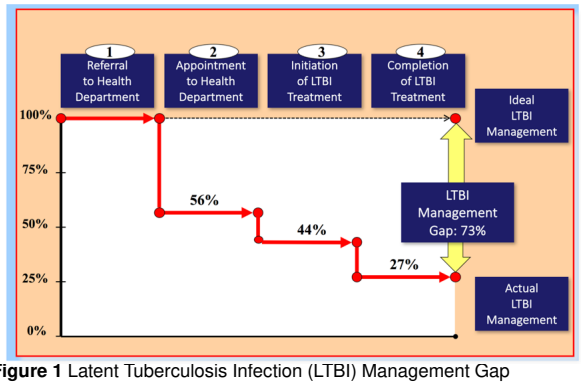


Figure 1 Latent Tuberculosis Infection (LTBI) Management Gap

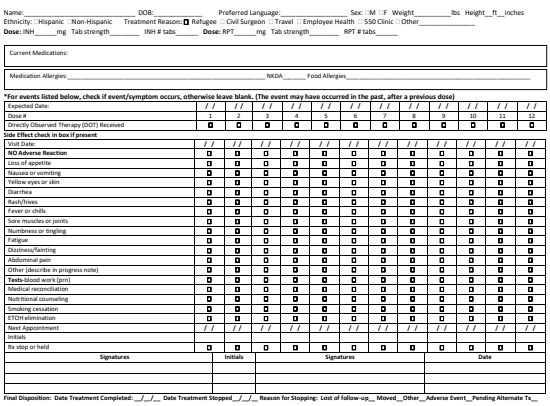
new clinic process led by an advanced practice registered nurse (APRN) expert in care for the refugee population and infectious diseases.

The objectives of this project were: 1) describe this new LTBI clinic, and 2) share the results of its first six months of operation.

Methods

This new approach to LTBI treatment provided in the UL-GHC refugee-centered medical home involved three core components and formed the basis for a pilot study assessing effectiveness. A medical home is defined by the Agency for Healthcare Reseach and Quality (AHRQ) as a location for care that is organized in a way that services are accessible, organized and of sufficient quality (AHRQ 2012). The three core components included: 1) initiation of an LTBI clinic led by an advanced practice registered nurse (APRN), 2) use of global health navigators (GHN) as key support personnel in the LTBI care and treatment plan, and 3) use of a 12-week Isoniazid/Rifapentine (INH/RPT) treatment regimen with directly observed therapy (DOT) (Centers for Disease Control and Prevention [CDC], 2013). DOT involves provision of medication to the recipient with visualization of medication self-administration. Therefore, DOT is a process that does not require a licensed healthcare worker as the patient is administering the medication to themselves.

The LTBI clinic was conceptualized by a group of APRNs with expertise in refugee healthcare, infectious diseases, program development and evaluation in late 2015. A lead APRN designed the clinic and workflow process with an emphasis on identification of specific competencies and skill sets needed by all members of the care team. The UL-GHC had recently initiated a GHN program that engaged former refugees experienced in healthcare or health education. These GHNs were brought into the LTBI clinic process as a means of promoting effective communication and culturally tailored care for the varied refugee populations targeted for LTBI treatment. Recognizing the risks associated with incomplete LTBI treatment (e.g., development of drug resistance), the 12-week INH/RPT treatment regimen promoted by CDC was chosen as the regimen of choice for the refugee population given their propensity for secondary migration and subsequent loss to follow-up (Greenwood & Warriner, 2011). A new clinic led by an APRN, supported by other APRNs and GHNs was implemented.


Name:___ DOB:___ Preferred Language:___ Sex: ☐M ☐F Weight_____lbs Height__ft__inches
Ethnicity: ☐Hispanic ☐Non-Hispanic Treatment Reasons: ☐ Refugee ☐ Civil Surgeon ☐ Travel ☐ Employee Health ☐ SSD Clinic ☐ Other_____
Dose: INH_____mg Tab strength_____ INH # tabs_____ **Dose:** RPT_____mg Tab strength_____ RPT # tabs_____

Current Medications:

Medication Allergies:_____ NKDA_____ Food Allergies:_____

***For events listed below, check if event/symptom occurs, otherwise leave blank. (The event may have occurred in the past, after a previous dose)**

Expected Date:	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Dose #	1	2	3	4	5	6	7	8	9	10	11	12		
Directly Observed Therapy (DOT) Received	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		
Side Effect check in box if present														
Visit Date:	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
NO Adverse Reaction	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Loss of appetite	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Nausea or vomiting	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yellow eyes or skin	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Diarrhea	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Rash/hives	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fever or chills	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sore muscles or joints	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Numbness or tingling	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fatigue	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Dizziness/fainting	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Abdominal pain	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other (describe in progress note)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tests-blood work (prn)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Medical reconciliation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Nutritional counseling	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Smoking cessation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
ETOH elimination	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Next Appointment	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Initials														
Rx stop or held	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Signatures	Initials	Signatures	Date

Final Disposition: Date Treatment Completed: __/__/__ **Date Treatment Stopped** __/__/__ **Reason for Stopping: Lost of follow-up__ Moved__Other__Adverse Event__Pending Alternate Tx__**

Figure 2 DOT Treatment Log

During the clinic development process, a number of tools and resources were developed that enabled an organized, efficient, and quality workflow such as DOT treatment log (**Figure 2**), education materials for patients and training materials for staff. All staff involved in the clinic were required to attend a specific training session where tuberculosis disease was reviewed and the ideal treatment regimens were discussed. Individual refugee population needs were identified and targeted resources were developed including medication information sheets. Treatment logs and safe medication handling protocol were developed and included in subsequent training sessions. Every person involved in the LTBI clinic was required to demonstrate competence in the areas of medication provision and handling, documentation, patient education, communication, and public health reporting. Certificates of achievement were provided by the APRN to the clinic staff upon completion of the training and demonstration of competence.

The new LTBI treatment approach began in early 2016 and data were collected after University of Louisville Institutional Review Board (IRB) approval and entered into ARIVE as part of standard of care documentation. Data were collected in the LTBI clinic from March-November 2016 and captured for analysis.

Results

The first six months (March-November 2016) of LTBI clinic operation are shown in **Table 1**. Twenty-four patients were provided with the INH/RPT regimen as standard of care. Of those, 23/24 (96%) completed the regimen within the suggested sixteen week time period, a significant improvement over the 27% completion rate using the previously described health department referral process. One patient moved after completing the first four weeks and was lost to follow-up. Six patients reported adverse events including nausea, diarrhea, fever, dizziness, and fatigue but none resulted in a regimen or treatment plan change. There were 24/24 (100%) of the patients who received their medication through DOT and 8/24 (33%) had at least one DOT episode provided in the home environment. There were 24/24 (100%) who had at least one interaction with the GHN as part of the treatment process with 23/24 (96%) having GHN involved in all DOT treatment doses. The results are demonstrated in **Figure 3**. One of the 24 spoke English fluently and preferred that all interactions occur with the APRN leading the LTBI clinic program. The new LTBI clinic process resulted in a treatment completion rate of 96%, and based on the results of the t-test, a statistically significant improvement over the previously used health department referral process (96% vs. 27%, $p<.001$) was identified.

Variable	Descriptive Statistics
Demographics	
Age, average (range)	38 (21-51) n= 24
Gender, male	18 (75%)
Country of Origin	
Burma/Myanmar	1 (4%)
Cuba	12 (50%)
Democratic Republic of Congo	3 (13%)
Eritrea	1 (4%)
Iraq	4 (17%)
Somalia	1 (4%)
Syria	2 (8%)
Preferred Language	
Spanish	12 (50%)
Arabic	6 (25%)
Swahili	2 (8%)
Chin	1 (4%)
English	1 (4%)
Kurdish	1 (4%)
Somali	1 (4%)
Treatment History	
Treatment changes, n (%)	0 /24 (0%)
Treatment completion n (%)	23/24 (96%)
Medication adverse events	6 /24 (25%)

Table 1 DOT Treatment Log

Discussion

The first six months of clinic operation identified a number of challenges including medication access, insurance verification, lapsing of insurance coverage, space constraints and other barriers previously identified such as transportation and work schedule conflicts. This new clinic approach could not resolve some of these issues, such as those involving insurance, but the use of personnel able to effectively communicate with the refugee combined with an active outreach program and emphasis on use of the 12-week treatment regimen provided new opportunities for LTBI treatment options unable to be provided through the traditional public health systems.

Limitations to this study involved the small sample size which limits the generalizability of the results.

Clinical Implications and Conclusions

This is the first report of an APRN-led LTBI treatment approach in a refugee-centered medical home using a 12-week treatment regimen. Aligning the clinic with the medical home enabled rapid access to other areas of expertise including primary care and specialty physicians and pharmacists. This level of collaborative practice served to maximize the use of multiple skill sets and enabled an effective inter-professional practice and education platform.

The findings lend themselves to new research initiatives. For example, can our methods enhance LTBI management for the larger refugee population? Can these approaches be generalized to the larger US population? Therefore, further studies are needed to generate evidence on the effectiveness of interventions that are tailored to specific risk groups, consider the availability resources, and take into account the existing infrastructure of the healthcare system.

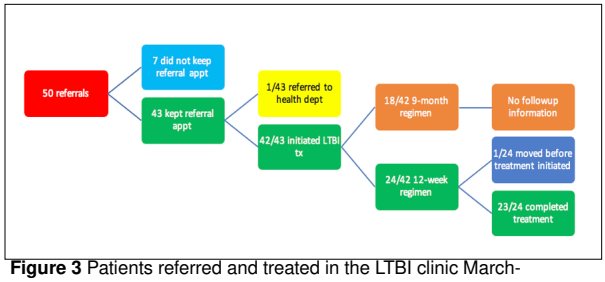


Figure 3 Patients referred and treated in the LTBI clinic March-November 2016

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Conflict of Interest: No authors have conflicts of interest to report.

References

Agency for Healthcare Research and Quality (AHRQ). (2012). Early Evidence on the Patient-Centered Medical Home. AHRQ Publication N. 12-0020-EF. Available from https://pcmh.ahrq.gov/sites/default/files/attachments/Early%20Evidence%20on%20the%20PCMH%202%2028%2012.pdf

Carrico RM, Goss L, Wiemken TL, Bosson RS, Peyrani P, Mattingly WA, Pauly A, Ford RA, Kotey S, Ramirez JA. (2017). Infection prevention and control and the refugee population, Experiences from the University of Louisville Global Health Center. Am J Infect Control. 45(6), 673-676.

CDC. (2013). Latent tuberculosis infection: A guide for primary health care providers. Available from https://www.cdc.gov/tb/publications/ltbi/pdf/TargetedLTBI.pdf

Colson, P., Franks, J., Sondengam, R., Hirsch-Moverman, Y., & El-Sadr, W. (2010). Tuberculosis Knowledge, Attitudes, and Beliefs in Foreign-born and US-born Patients with Latent Tuberculosis Infection. Journal of Immigrant and Minority Health, 12(6), 859-866. doi:10.1007/s10903-010-9338-4

Greenwood, M.J. & Warriner, W.R. (2011). Immigrants and the spread of Tuberculosis in the United States, A hidden cost of immigration. Population Research and Policy Review, 30(6), 839-859.LoBue, P.A., Mermin, J.H. (2017). Latent tuberculosis infection, The final frontier of tuberculosis elimination in the USA. Lancet, S1473-3099 (17), 30248-7. Available from http://www.thelancet.com/pdfs/journals/laninf/PIIS1473-3099(17)30248-7.pdf

Office of Refugee Resettlement (2016). FY 2015 Served Populations by State and Country of Origin (all served populations). Available from http://www.acf.hhs.gov/programs/orr/resource/fy-2015-served-populations-by-state-and-country-of-origin-refugees-only Tsang, C.A., Langer, A.J., Navin, T.R., Armstrong, L.R. (2017). Tuberculosis among foreign-born persons diagnosed ≥ 10 years after arrival in the United States, 2010-2015. MMWR. 66(11), 295-298.

Wieland, M., Weis, J., Yawn, B., Sullivan, S., Millington, K., Smith, C., . . . Sia, I. (2012). Perceptions of Tuberculosis Among Immigrants and Refugees at an Adult Education Center: A Community-Based Participatory Research Approach. Journal of Immigrant and Minority Health, 14(1), 14-22. doi:10.1007/s10903-010-9391-z