ORIGINAL ARTICLE

A Single Centre Quality Improvement Project for Tuberculosis Preventive Therapy in People Living with HIV

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Abstract

Persons living with HIV should receive tuberculosis preventive therapy at least once in their lifetimes. Current practice at the Matron Roberts Polyclinic II (Belize City, Belize) is of a six-month course of isoniazid in combination with pyridoxine for patients deemed unlikely to have active tuberculosis. A medical records audit was conducted for April, 2021 with the objective of analyzing the initiation and completion of tuberculosis preventive therapy for people living with HIV seen in the polyclinic. This study was inconclusive due to a lack of standardization of the tuberculosis screening methods used, varied duration of tuberculosis preventive therapy and inconsistencies found in the documentation of the progress and completion of tuberculosis preventive therapy. In order to address these areas, a quality improvement project was conducted utilizing the Plan, Do, Study, Act methodology. This project was done with the objectives of standardizing the tuberculosis screening methodology, the duration of tuberculosis preventive therapy and the documentation of the course of tuberculosis preventive therapy for people living with HIV. In order to achieve this, the following measures were taken: 1) four-question screening was standardized as the method of choice for tuberculosis screening; 2) tuberculosis preventive therapy was established as a six-month duration of isoniazid and pyridoxine; and 3) a documentation insert was added to the clinical notes to document tuberculosis screening and the progress of tuberculosis preventive therapy, among other parameters. Of the targets measured during the three months of the project, the outcomes were: 1) an average usage rate of 74.4% of the documentation insert for persons living with HIV; and 2) an average rate of initiation or continuation of tuberculosis preventive therapy of 64.3% for persons living with HIV seen over the duration of the project.

Keywords

Tuberculosis preventive therapy/treatment (TPT); Isoniazid; Plan, Do, Study, Act Methodology (PDSA)

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■ INTRODUCTION

Globally, TB is the leading cause of mortality among people living with HIV (PLHIV), accounting for one-third of all HIV-related deaths in 2018. (1) Although specific TB mortality data is not available for PLHIV in Belize, statistics from the Ministry of Health and Wellness indicate that of 484 newly diagnosed TB patients between 2016 and 2020, 24.4% of these individuals were also co-infected with HIV. Worldwide data further indicates that PLHIV are approximately 20 times more likely to progress to active TB when compared to HIV-negative individuals. This data, coupled with evidence that tuberculosis preventive treatment (TPT) aids in reducing the overall risk of TB by 33%, highlights the importance of ensuring that TPT is prescribed as a standard part of the care for PLHIV. (1)

With the revision of the National Tuberculosis Treatment Guidelines in 2017, there was an effort nationally to improve TB screening and initiation of Isoniazid Preventive Therapy (IPT [as it was called at that time]). Despite this, it was noted over time that within the Matron Roberts Polyclinic (MRPC) there were inconsistencies with the screening methodology and there was a poor rate of initiation and completion of IPT. With the publication of

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the WHO Consolidated Guidelines on Tuberculosis in 2020 and the publication of The National HIV Guidelines Belize 2021, (2) some clarity was gained regarding the screening and an enhanced effort was made to improve TB screening and TPT initiation and continuation.

The WHO Consolidated Guidelines on Tuberculosis (1) stipulate the following options for TPT: 1) daily isoniazid for 6-9 months; 2) weekly rifapentine plus isoniazid for 3 months; 3) daily isoniazid plus rifampicin for 3 months; 4) alternative treatments of daily rifapentine plus isoniazid or daily rifampicin for 1 and 4 months, respectively. In the MRPC, the standardized TPT treatment is daily isoniazid for 6 months; however prior to the implementation of this project the targeted duration varied between 6 and 9 months.

This quality improvement project was designed to improve performance with TPT in the MRPC using the Plan, Do, Study, Act Methodology (PDSA). (3,4) The specific objectives follow:
1) To standardize the TB screening methodology.
2) To standardize the duration of tuberculosis preventive therapy utilized in the clinic.
3) To improve the documentation by Medical Officers of TPT for PLHIV.

■ METHOD

Audit

An audit was conducted to evaluate the TB screening methodology as well as TPT initiation, documentation and completion for PLHIV seen in the MRPC in April, 2021. Patients' clinical records in the Belize Health Information System (BHIS) were reviewed and the relevant data was compiled, subsequent to which identifying information was removed (name, age, gender, BHIS identification number) in order to ensure protection of patient privacy.

77 cases were reviewed. 80% of patients were screened for TB at least once since their HIV diagnosis was first made. The screening methodology, however, varied among chest x-rays, four-questions screening, GeneXpert, AFB smears and Tuberculin Skin Testing. Four-question screening proved to be the most effective method, with a 91.9% completion rate, compared to 66.4% and 55.3% where GeneXpert and chest x-rays were used, respectively. Only 38% of patients had documentation at least once indicating their progress during the course of TPT. This documentation was not standardized and was found in varied locations of their BHIS record (i.e. clinical notes or prescription sections).

Given the lack of standardization in several aspects relating to TPT, it was difficult to draw firm conclusions from this audit. It did, however, bring to the forefront the following problems: 1) there was a lack of standardization of the TB screening method; 2) there was signification variation in the duration of TPT; 3) there was no standardization of the documentation to track initiation, progress and completion of TPT.

Quality Improvement

The doctors and pharmacists of the MRPC were identified as the individuals most likely to effect a change that would lead to an improvement in the clinic's performance with TPT. This was so deemed because of the level of detail in which medications and compliance is discussed with patients in their interactions with these members of staff as they transit through the clinic.
Plan-Do-Study-Act (PDSA) was the chosen QIP methodology as it allows for a cyclical approach which obligates regular re-evaluation and adjustments in order to achieve the overall improvement that was being pursued.

Three principal changes were implemented:
1) Standardization of four-question screening as the TB screening methodology of choice:
a. Cough for > 2 weeks
b. Fever
c. Night sweats
d. Weight loss
2) Standardization of TPT as isoniazid (single 300 mg tab daily) plus pyridoxine (single 50 mg tab daily) for six consecutive months
3) Utilization of a documentation insert in the clinical notes of PLHIV seen in the clinic, which included but was not limited to the following:
a. Today's TB screening
b. TPT progress/completion
c. CD4 count
d. Viral load

The decision was taken to carry out three PDSA cycles of a duration of one month per cycle. The original intention was for a timeframe of July, August and September; however, there was a setback with the data analysis in August which resulted in a delay of the second cycle. Ultimately, the cycles were conducted in July, September and October of 2021.

All cycles were conducted with the following two incremental targets:
1. To utilize the HIV documentation insert for x% of PLHIV seen in the month.
2. To initiate/continue TPT for x% of PLHIV who are eligible for TPT in the month.

Cycle 1 (July, 2021)

Plan
The HIV documentation insert was created; the TB screening methodology and TPT were standardized; sensitizations sessions were held and the decision was taken to ensure issuances of two-month TPT prescriptions.
Do
The HIV documentation insert, four-question screening as

the TB screening methodology and six-month duration of TPT were implemented at the beginning of July, 2021. Data collection was also initiated during this phase and included information on the usage of the documentation insert, completion of TB screening and initiation/ continuation of TPT, among other elements.

Study

A detailed data analysis was carried out with the information collected and it was found that the targets were surpassed:

1. To utilize HIV documentation insert for 50% of PLHIV seen in July, 2021 - 61.9% achieved
2. To initiate/continue TPT for 50% of PLHIV who are eligible for TPT in July, 2021 – 52% achieved

In general, the change implemented was well received by the physicians and the pharmacists. There was, however, some misinterpretation of the directives by some of the physicians and there were some variations to the information included in the HIV documentation inserts.

Act

The decision was taken to continue with the project and to increase the targets in cycle 2.

Cycle 2 (September, 2021)

Plan

There was a delay in data collection and interpretation in August, resulting in the postponement of cycle 2 to September. The targets were increased and set as follows:

1. To utilize HIV documentation insert for 75% of PLHIV seen in July, 2021
2. To initiate/continue TPT for 75% of PLHIV who are eligible for TPT in July, 2021

Re-sensitization was carried out with the doctors and pharmacists and it was noted that towards the end of August there was a limitation in the supply of Isoniazid and it was feared that this shortage would continue or worsen into September.

Do

The previously implemented measures continued in effect with the increased targets.

Study

Despite significant improvements in the performance during this second cycle, data analysis indicated that only one of the two targets was met:

1. To utilize HIV documentation insert for 75% of PLHIV seen in July, 2021 - 91% achieved
2. To initiate/continue TPT for 75% of PLHIV who are eligible for TPT in July, 2021 – 71.4 % achieved

A significant hindrance was the limited availability of isoniazid during September and it was also observed that the month of September saw a significant increase in the total number of PLHIV seen in the clinic and this may have contributed to an increased usage of TPT, thereby compounding this shortage.

Act

Despite the TPT shortage, the project was continued with a further increase in target #1 while target #2 was kept at the same level for the final cycle.

Cycle 3 (October, 2022)

Plan

The targets used for the final cycle were the following:

1. To utilize HIV documentation insert for 90% of PLHIV seen in July, 2021.
2. To initiate/continue TPT for 75% of PLHIV who are eligible for TPT in July, 2021.

Do

The measures were implemented for the month of October, 2022 with the above-mentioned targets.

Study

Cycle 3 data analysis revealed the following performance:

1. To utilize HIV documentation insert for 90% of PLHIV seen in July, 2021 - 70.4% achieved
2. To initiate/continue TPT for 75% of PLHIV who are eligible for TPT in July, 2021 – 69.6% achieved

This performance was considerably less than expected, especially with target #1. This may be attributed to the fact that in October, 2022 a drug resistance study was undertaken in the clinic and a considerable amount of focus was shifted towards that project, possibly compromising the attention to this aspect of care.

Act

To conclude the project, the decision was ultimately taken to adapt the change and to make the measures taken as a part of this project a permanent feature of the management of PLHIV seen in the MRPC.

■ RESULTS

Between July and September there was a significant increase in the number of PLHIV seen in the clinic and this is evidenced in Figure 1.

For target # 1 (usage of HIV documentation insert), goals of 50%, 75% and 90% were set for the months of July, September and October, respectively. These were surpassed with scores of 62% (July) and 90.8% (September); but fell short by almost 20% in October when only 70.4% was achieved. This is depicted in Figure 2 which also indicates (blue columns) the numbers of patients for whom the documentation insert was utilized.

In the case of target # 2, targets of 50%, 75% and 75% were set for the same months, respectively. In this instance, however, the targets were only reached for one of the three months of the project with levels of 52% (July), 71.4% (September) and 69.6% (October) attained.

CD4 count and viral load are important markers in the management of PLHIV and were for this reason included as a part of the documentation insert. Analysis of the data indicated that once the documentation inserts were used, almost 100% of patients had these parameters documented. In cases in which the insert was not utilized, documentation of CD4 count and viral load averaged 11.8% and 10.4%, respectively across the three months of the project (Figures 4, 5).

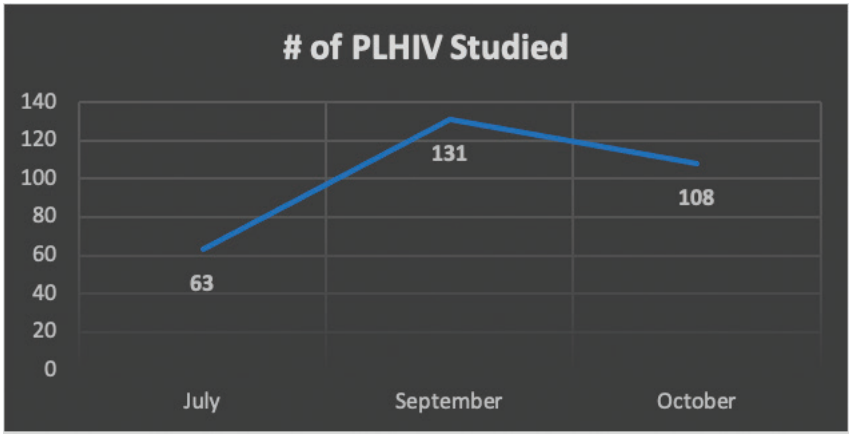

Figure 1. Line graph indicating the number of PLHIV studied for the duration of the QIP.

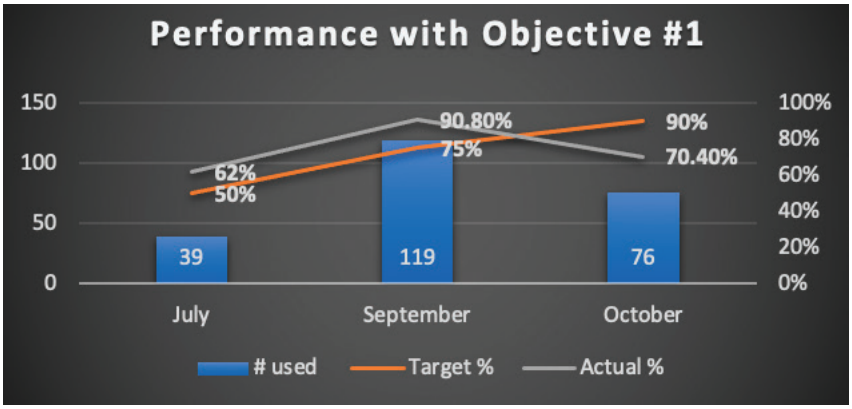

Figure 2. Combination graph indicating trend of performance with target # 1 throughout the 3 months of the QIP

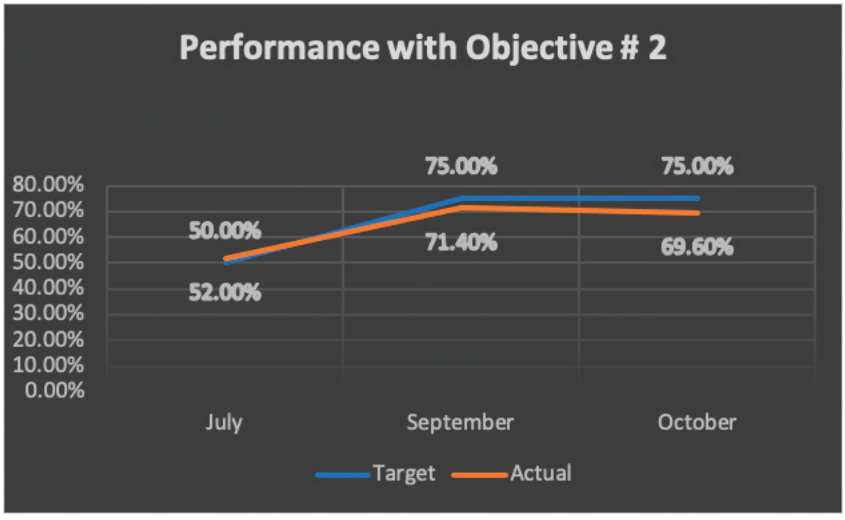

Figure 3. Line graph indicating trend of performance with target # 2 throughout the 3 months of the QIP

■ DISCUSSION

Despite all the targets not being met throughout the project, this QIP was effective in achieving the objectives as initially laid out. As such, the TB screening methodology was standardized as the four-question screening; TPT was standardized as six consecutive months of isoniazid in combination with pyridoxine and the documentation of TPT was improved by the utilization of the HIV documentation insert. Prior to this, there was little standardization in all of these areas.

The impact of the project can also at this time be seen with the improved ease of the day-to-day management of PLHIV. However, the ultimate goal is to see an eventual increase in completion of TPT among PLHIV which can lead to lower rates of progression to clinical TB. From the experience gained in conducting this project, it can be foreseen that a key barrier to achieving the desired high rates of TPT completion is likely to be the supply of pharmaceuticals as this was a key barrier to the greater success of this QIP.

■ CONCLUSIONS

This QIP resulted in the standardization of both the TB screening methodology, TPT and of the documentation of TPT in PLHIV seen in the MRPC. The change implemented was found to be both practical and simple and these characteristics contributed to good usability and compliance. Similar, targeted changes can be applied in the different levels of healthcare and in different institutions in Belize, at low cost and high impact. It is hoped that this project is viewed in such a light and that it is taken as an example that small changes can result in significant impact.

Proyecto institucional de mejora de la calidad del tratamiento preventivo de la tuberculosis en personas que viven con VIH.

Resumen

Las personas que viven con el VIH deben recibir un tratamiento preventivo contra la tuberculosis al menos una vez en la vida. La práctica actual en la Policlínica Matron Roberts II (Ciudad de Belice, Belice) consiste en una pauta de seis meses de isoniazida en combinación con piridoxina para pacientes que se considera poco probable que tengan tuberculosis activa. Se realizó una revisión de historias clínicas en abril de 2021 con el objetivo de analizar el inicio y finalización de la terapia preventiva contra la tuberculosis en personas que viven con VIH, atendidas en la policlínica. Este estudio no fue concluyente debido a la falta de estandarización de los métodos de detección de tuberculosis utilizados, la duración variable de la terapia y las inconsistencias encontradas en la documentación del progreso y finalización de la terapia preventiva contra la tuberculosis. Para abordar estas áreas, se llevó a cabo un proyecto de mejora de la calidad utilizando la metodología Planificar, Hacer, Estudiar, Actuar. El objetivo fue estandarizar la metodología de detección de tuberculosis, la duración de la terapia preventiva contra la tuberculosis y la documentación del curso de terapia preventiva contra la tuberculosis para personas que viven con VIH.

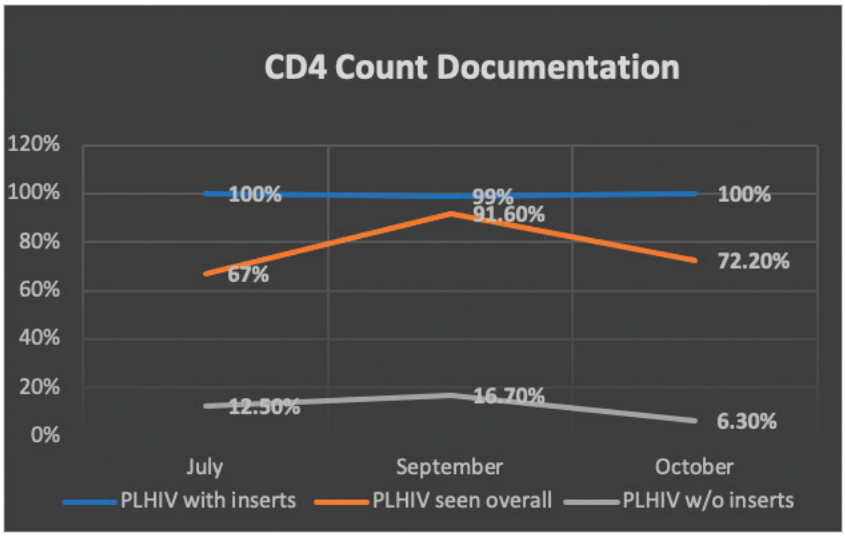

Figure 4. Line graph indicating rates of CD4 documentation in three categories of PLHIV

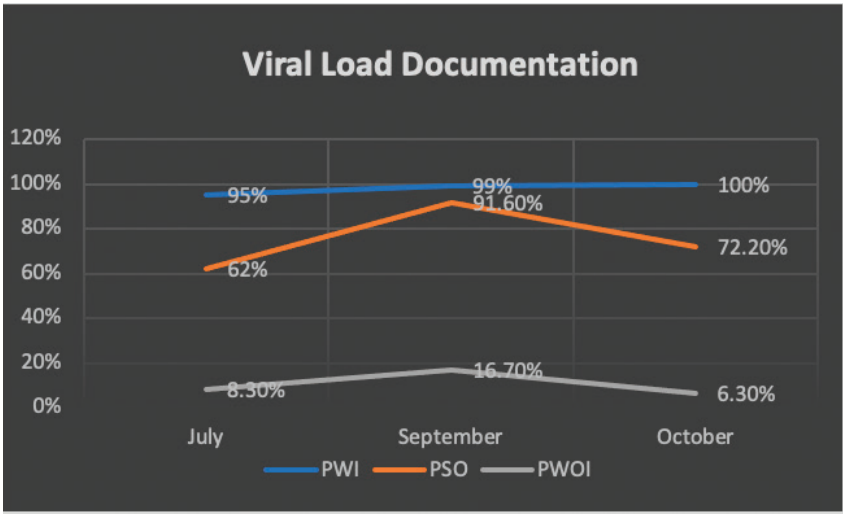

Figure 5. Line graph indicating rates of viral load documentation in three categories of PLHIV

Para lograrlo, se tomaron las siguientes medidas: 1) se estandarizó la pesquisa con cuatro preguntas como método de elección para el tamizaje de tuberculosis; 2) se estableció la terapia preventiva de la tuberculosis con isoniazida y piridoxina durante seis meses; y 3) se agregó un anexo a las notas clínicas para documentar el tamizaje de tuberculosis y el progreso de la terapia preventiva de tuberculosis, entre otros parámetros. De los objetivos medidos durante los tres meses del proyecto, los resultados fueron: 1) una tasa de uso promedio del 74,4% del anexo de documentación para personas que viven con el VIH; y 2) una tasa promedio de inicio o continuación de la terapia preventiva de la tuberculosis del 64,3% para las personas que viven con VIH atendidas durante la duración del proyecto.

Keywords
Tratamiento preventivo para tuberculosis; Isoniacida; Metodología PDSA

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