Abstract # 40816

Changes in *Mycobacterium tuberculosis* Epidemiology at a Large Cancer Center: Development of a Pre-Arrival Screening Strategy for Exposure Control

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SEATTLE CANCER CARE ALLIANCE INFECTION PREVENTION

1 Abstract

Background: A single *M. tuberculosis* (TB) case has the potential to lead to transmission in cancer centers where the majority of patients are immunocompromised. Patients with active TB can present with symptoms and or pulmonary abnormalities that raise suspicion for cancer, leading to referral to such centers. **Methods:** The Seattle Cancer Care Alliance (SCCA) Infection Prevention Program initiated a TB risk assessment after two unrelated cases of pulmonary TB were diagnosed in May 2012. We developed a screening questionnaire of TB risk factors that was administered prior to arrival. Targeting two high-risk subspecialty clinics (head, neck and lung oncology and pulmonary nodule clinics), patients at risk for TB underwent testing prior to arrival or were seen in airborne precautions on first visit.
Results: Prior to 2012, TB incidence at the SCCA was low, with a frequency of approximately one case per 300,000 unduplicated patients served annually. During 2012, four cases of TB were identified: two pulmonary and two extrapulmonary. All cases were from countries with high TB incidence (75-385/100,000 per year). From June 2012 to April 2013, targeted TB screening for patients receiving care in two clinics detected risk factors in 24/860 (2.7%); an additional seven patients were identified in other clinics. The most common risk factors identified were: history of living in or extensive travel to a TB endemic country, 18(58%); symptoms of active TB, 10(32%); history of a positive TB test, 6 (23%); close contact/family with TB, 4 (13%); reported history of TB, 3(10%); living situation/employment, 2(6%). Of those with risk factors who completed TB evaluation, 23 (74%) were ruled out, three (10%) were diagnosed with nontuberculous mycobacteria, and two (6%) had extrapulmonary TB. Three (10%) additional patients were referred to other healthcare organizations; their TB-related outcomes are unknown. Due to pre-visit screening, only a small number of patients required isolation 22.6% (7/31) at their first visit. **Conclusion:** Administration of a standardized TB screening questionnaire in targeted oncology populations is an effective means to identify at high-risk patients. Pre-arrival evaluation of these patients has the potential to reduce unprotected exposures in outpatient environments with such vulnerable populations.

2 Background

- Patients with symptoms that raise suspicion for cancer may actually have MTB.
- Latent TB is more likely to develop active disease in patients undergoing immunosuppressive cancer treatment.
- In our comprehensive cancer center, outpatient oncology and hematopoietic cell transplant patients make up approximately 75,000 unique patient visits per year.
- In 2012, we identified an increase in TB when two cases occurred within one week of each other and resulted in contact investigations and potential exposures.
- Infection Control and Prevention (IC) developed a comprehensive plan to screen patients prior to arrival at the clinic to avoid such exposures.

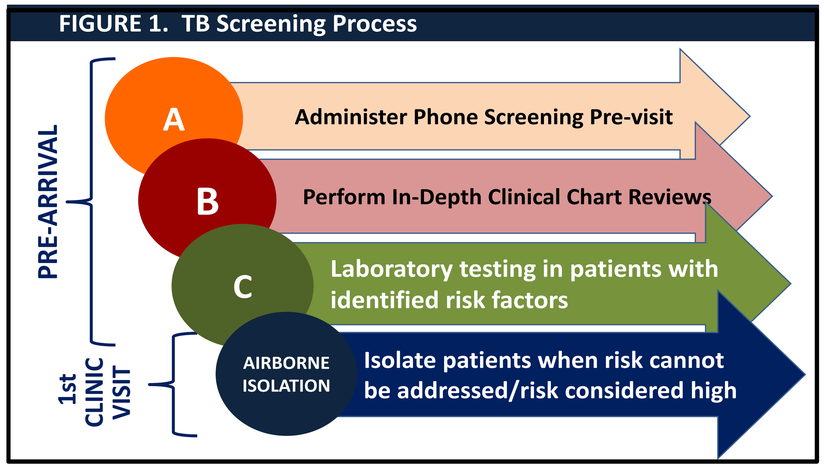
3 Objectives

- Perform a comprehensive review of all patients with known MTB over the past 5 years at our center
- Evaluate the effectiveness of our screening program to identify patients with TB risk factors prior to the first clinic visit.
- Address TB risk factors specific to our oncology population.

4 Methods

- We developed a TB screening questionnaire that was:
  1) Administration 5-10 minutes (brevity)
  2) Non-medical staff could administer
- Screening Pilot in 2 high-risk clinics from Jun 2012 - April 2013 (Figure 1):
  1) Head, neck and lung oncology
  2) Pulmonary nodule clinic

FIGURE 1. TB Screening Process

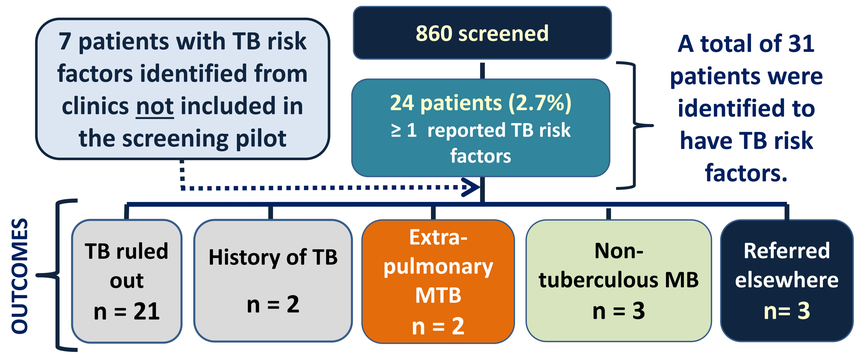


5 Results

Table 1. MTB Cases per Year Between 2008-2012 at the SCCA

Year	2008	2009	2010	2010	2011	2012	total
No. of MTB cases (% total)	0 (0)	1 (14)	1 (14)	1 (14)	0 (0)	4 (57)	7
Cases per 100,000 pt visits*	0	1.3	1.3	1.3	0	5.3	1.6

FIGURE 2: Screening Results



5 Results (continued)

- Risk factors were rarely reported(24/860, [2.7%])
- 31 patients reported a total of 43 MTB risk factors (Figure 3).
  - 18 (58%) from a country with a high burden of MTB
  - Interestingly, 7/31 (23%) w/ MTB risk factors from clinics not participating in the screening pilot.
- 4 patients with a history or suspicion of MTB (Table 2); 3 from high-burden countries; 2 with extrapulmonary MTB
- Due to screening and isolation there were no MTB exposures during follow-up.

Figure 3: Type of TB Risk Factors Reported during the Screening Interview
(N=43 Risk Factors in 31 Patients)

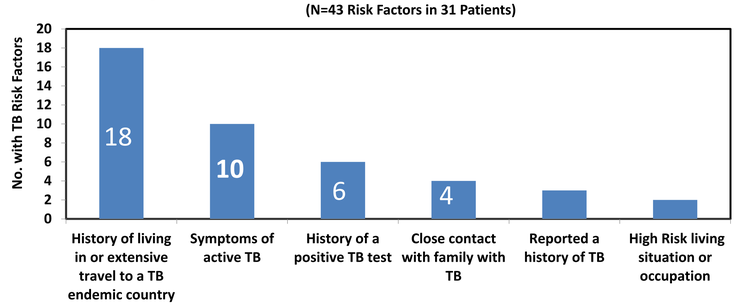


TABLE 2. Demographics of Patients w/ MTB, June 2012-April 2013

Pt	Age/Sex	TB Outcome	TB Risk Factor	Symptoms	Clinic	Diagnosis
1	34/M	Extrapulmonary Abdominal & mediastinal MTB	Foreign-Born (India)	Dry cough and weight loss of 20lbs over 6-month period	Lung, Head, and Neck	**No oncology diagnosis.** Suspected lymphoma, diagnosed w/ extrapulmonary TB.
2	30/F	Extrapulmonary MTB cervical adenitis	Foreign-Born (Somalia)	5-month history of LAD in her L neck, 2+ Acid Fast Bacilli from L cervical LAD	Gyn/Onc	**No oncology diagnosis.** Suspected choriocarcinoma, diagnosed with extrapulmonary TB.
3	69/M	Hx of Pulmonary MTB & successful treatment 1 month prior	Homeless	Hemoptysis & cough	Diagnostic services	**No oncology diagnosis.** Diagnostic testing confirmed Barrett's Esophagus.
4	61/M	Hxof Latent MTB & completed one year of Rx in 80s	Foreign-born (Philippines)	Wheezing & headache. Dx w lung cancer prior to arrival	Lung, Head, and Neck	Small cell carcinoma of lung with brain metastasis.

6 Summary/Conclusions

- Standardized, pre-arrival MTB screening is an effective way to identify patients with significant risk factors in low incidence outpatient settings.
- A history of living in countries with high MTB-burden was the most frequent risk factor overall, and linked to all proven MTB cases.
- Unanticipated benefits were increased staff awareness of MTB risk factors and improved isolation practices throughout the center.