Effectiveness of the Immigration Medical Surveillance Program for Tuberculosis in Ontario

Aparna Uppaluri, MHSc[1]
Monika Naus, MD, MHSc[2]
Neil Heywood, MB[3,*]
James Brunton, MD[4]
Diane Kerbel, MSc[2]
Wendy Wobeser, MD, MSc[5]

ABSTRACT

Background: Citizenship and Immigration Canada (CIC) screens immigrants for TB and permits those with inactive pulmonary TB to enter Canada conditionally, subject to medical surveillance; we studied this program in Ontario.

Method: This was an administrative database study with linkage of national and provincial data.

Results: In 1994-95, 1,341 cases of foreign-born active TB were diagnosed and a CIC record was found for 1,095. 149 (14%) were classified for surveillance and 142 were included in the analysis. A significant proportion (39/142: 27%) were diagnosed either before or as a result of immigration screening in Canada. These persons had arrived as visitors or refugees and were excluded from further analysis. Only 21 of the remaining 103 persons (20%) with immigration screening before the diagnosis of TB adhered to surveillance. Only 1 of 16 (6%) eligible persons was given therapy to prevent future episodes of active TB. Most presented with symptoms (82/103: 82%) suggesting potential for TB transmission in Ontario.

Interpretation: The current TB surveillance system for high-risk immigrants to Ontario is not effective in identifying and treating latent infection, and thus not effective in preventing future cases.

The translation of the Abstract appears at the end of the article.

1. Department of Medicine, University of Toronto, Toronto, ON
2. Disease Control Service, Public Health Branch, Ontario Ministry of Health, Toronto, ON
3. Immigration Health Policy Selection Branch, Citizenship and Immigration Canada, Ottawa, ON
4. Department of Medicine, University of Toronto and The University Health Network, Toronto, ON
5. Department of Medicine, Queen's University and Kingston General Hospital, Kingston, ON
* Opinions expressed are those of the author and may not represent the views of the department.
Correspondence and reprint requests: Wendy Wobeser, 3013 Etherington Hall, Queen's University, Kingston, ON K7L 3N6, Tel: 613-533-6619, Fax: 613-533-6825, E-mail: wlw@post.queensu.ca

In Canada, and in the rest of the developed world, the burden of tuberculosis (TB) is increasingly concentrated in the foreign-born population.[1-3] In Ontario, over 80% of TB cases are among foreign-born persons. Citizenship and Immigration Canada (CIC) administers an immigration screening program for TB.[4] This program aims to identify: 1) persons with active TB needing curative treatment before immigration, and 2) persons at high risk of developing TB (inactive pulmonary TB), who would benefit from preventive interventions after immigration. The latter group enter Canada conditional upon presenting for medical surveillance for TB (MSTB) and are referred to local public health officials. Persons who apply to become a landed immigrant in Canada, including those who make a refugee claim, would have the immigration medical exam in Canada and may have been diagnosed in this country either prior to or as a result of this exam.

Persons referred for MSTB in Canada are a high-risk group.[4] A large proportion (1.5-2.8%) are diagnosed with active disease at their first medical evaluation after arrival[2,5] and, in Canada and the U.S., are at a relative risk of 4.0-5.0 for the development of TB compared to those not referred.[6,7] Recent American and Canadian guidelines suggest that preventive treatment should be offered to individuals who are at a high risk of progression to active disease, including those with fibrotic changes on chest x-ray consistent with prior TB and those recently immigrating from high-risk countries.[8,9] A medical surveillance program should detect cases earlier, result in fewer hospital admissions, and reduce TB transmission.[10] Operational problems with the provision of medical surveillance may not only seriously compromise the cost-effectiveness of such a program,[11] but also subject the Canadian population to risk. Ontario is the destination for approximately half of all persons immigrating to Canada. Very little work has been done in evaluating the process of medical surveillance for TB (MSTB) in Ontario. The growing prevalence of multidrug-resistant TB worldwide and the 2000 outbreak of this disease in Hamilton clearly underscores the necessity for a functioning program. This study was undertaken to determine if the surveillance process contributed to the detection of active TB

among foreign-born individuals in Ontario who were classified for MSTB and who were diagnosed with active disease.

METHODS

Tuberculosis is a reportable disease in Ontario. All foreign-born individuals who developed active TB in 1994-95 in Ontario were identified using the provincial TB surveillance system (Reportable Disease Information System - RDIS). RDIS is a non-nominal database, so nominal data were provided by the public health units. RDIS data included date of birth, gender, method of detection, date of arrival in Canada, date of diagnosis of TB, and method of diagnosis. Cases were linked to the databases at CIC to determine surveillance classification[7] as well as time of immigration, refugee claims and other visa applications. Cases of TB who had been referred for medical surveillance were included in this study. Health unit charts were acquired and provided information regarding adherence to medical surveillance and utilization of treatment for latent tuberculosis infection.

Persons who were diagnosed with TB before their immigration medical exam and those who were diagnosed as a result of this exam (both in Ontario) were quantified and excluded from further analysis. The remainder were analyzed according to whether they adhered to medical surveillance or not. Data were maintained using Microsoft Access software and record linkage was performed using EpiInfo and Foxpro. Analysis was performed using SPSS software. Chi square test was used for categorical variables and ANOVA (f-statistic) was used for continuous variables.

RESULTS

There were 1,653 cases of TB in 1994-95 in Ontario, 81% (1,341) among foreign-born individuals. A record was found for 1,095 (82%) of these individuals in the CIC databases. A total of 149 (14%) cases had been classified for MSTB. All of these cases were enrolled in the study. Charts for 146/149 (98%) were located and sufficient data were available for 142.

Figure 1 demonstrates the method of detection of the 142 cases. Thirty-nine of 142 (27%) of the cases were diagnosed either prior to the immigration screening (13/39) or as a result of the immigration screening (26/39) and had entered Canada without being screened for TB. These persons had arrived in Canada primarily as refugees or visitors. Refugee claimants comprised 49% (19/39); visitors 30% (10/39); and those on a work or student visa 15% (6/39). The status of 4 was unknown.

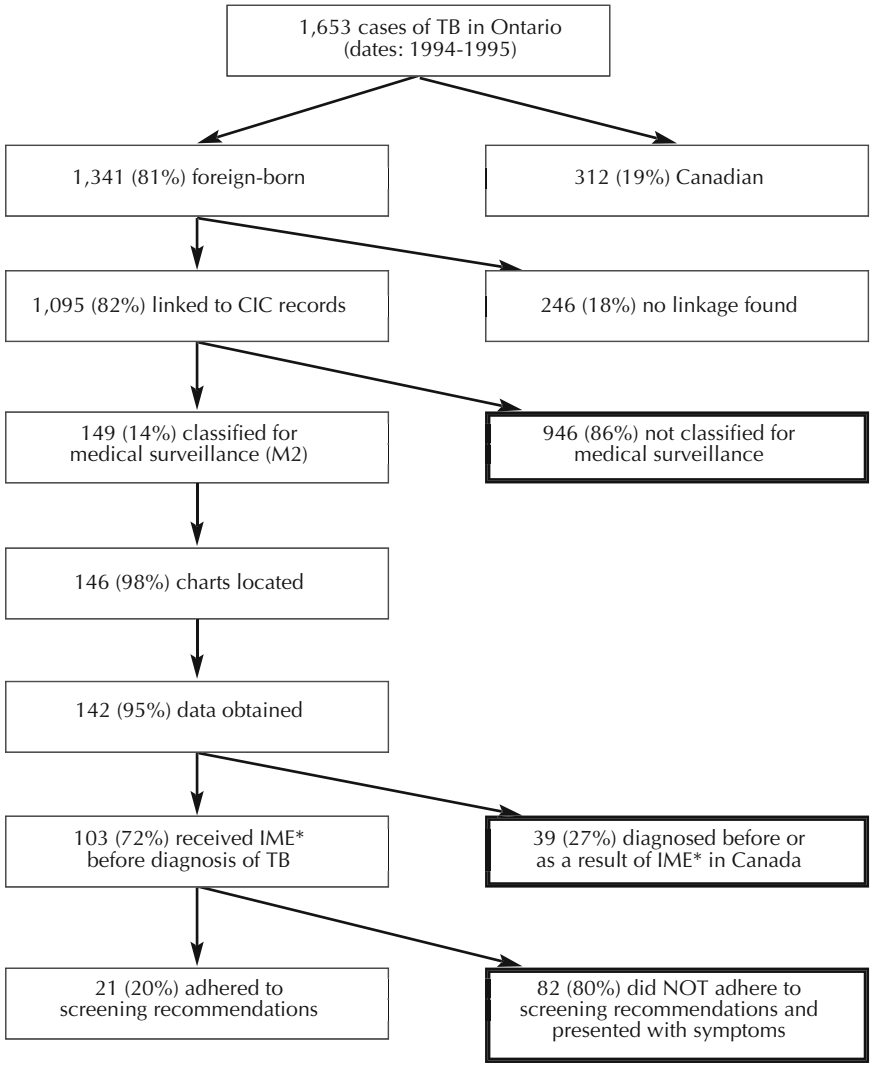

Figure 1. TB cases in Ontario, medical surveillance and adherence rates

* IME – Immigration medical exam

Among the 103 persons who were diagnosed after their immigration medical exam, 21 (20%) adhered to the requirements of MSTB and were in contact with the health unit. However, only 10 (10%) reported to a provincial health unit within 30 days of arrival in Canada as required. The majority of the cases (82/103) did not have any documentation of adherence to medical surveillance requirements and presented with symptoms. Characteristics of each group are compared in Table I. Of the 82 cases not adherent to medical surveillance (group 4), 16 (20%) had the original immigration medical examination in Canada, 66 outside Canada. Among those adherent to medical surveillance, the median time between their original immigration medical exam and arrival in Canada (40 weeks; range 22-94) was within the one-year requirement. This was not the case among those not adherent (median 54 weeks; range 33-83). Persons who did not adhere to surveillance were diagnosed significantly later than those who adhered ($p<0.02$). Of the 21 persons who adhered to medical surveillance, 5 were diagnosed with active TB at their first assessment in Canada. The rest of the 16 cases were identified later and only 1/16 (6%) began

TABLE I

Characteristics of Persons Classified for Medical Surveillance by Adherence (Ontario, 1994-95)*

	Adherent to Surveillance n=21		Non-Adherent to Surveillance n=82	
Age at Diagnosis Median (range)	40	(16 – 82)	43	(17 – 88)
Gender Male	10	(49.1%)	44	(53.8%)
Female	11	(50.9%)	38	(46.2%)
Duration (weeks) from Date of Medical Exam to Arrival Median (range)	40	(22 – 94)	54 †	(33 – 83)
Duration (weeks) from Date of Arrival to Diagnosis Median (range)	104	(22 – 321)	232	(40 – 780)‡
Active TB at initial visit	5	(23.8%)		
Not active at initial visit, started preventive therapy	1/16	(6.25%)		

* 39 cases diagnosed either before or as a result of an in-Canada immigration medical are excluded
† data available for only 60% of cases
‡ $p<0.02$

treatment for latent tuberculosis infection (LTBI).

DISCUSSION

The Canadian immigration TB screening program has two aims: 1) to prevent persons with active TB from entering the country, and 2) to identify people who are at high risk for future development of TB. This study deals only with the latter. This study assessed how well the current surveillance system works in following up immigrants with latent TB infection and at high risk of reactivation in Ontario. We found that of all active cases of TB in the foreign-born population in Ontario, 86% had not been classified for medical surveillance. Of those who were classified for surveillance, 80% did not adhere to screening recommendations and presented with symptoms of active TB. This suggests that the current TB prevention strategy for high-risk immigrants in Ontario is not working.

Adherence to medical surveillance was very poor – 20% overall and 10% within 30 days as recommended by Canadian medical surveillance guidelines.[4] As most presented with symptoms, there was a real potential for transmission in Canada. Other studies have also shown poor but better results. In BC and Manitoba, 4-19% of referred persons were never seen at least once and many did not attend follow-up visits.[2,5] Some American programs appear to be doing better, with a similar program in California reporting 97% follow-up with prompt notification and sequential follow-up.[12] This program also had a notably short time from arrival to reporting (mean 9 days; range: 1 to 920 days). This suggests that it is possible to improve program performance. This would obviously not be without cost, however may be justified to protect our population from the deadly and increasingly prevalent world-wide multiple drug-resistant TB.

The low adherence rate in Ontario could be a reflection of significant barriers faced by persons immigrating to Canada in terms of access to medical care, lack of understanding, mistrust and fear of deportation.[13,14] Failure to report for further medical evaluation and physician non-adherence to procedures relating to TB screening have been found to be dependent on a variety of socio-demographic characteristics.[13] Recent immigrants to Ontario are faced with several financial and social challenges, including the lack of medical insurance for a minimum of 3 months after arrival. In Australia, being a refugee was found to be an independent predictor of failure to seek further medical evaluation.[15] In-Canada refugee claimants are provided with health care coverage by way of the interim federal health (IFH) program. It is not known if the existence of such a program improves adherence to medical follow-up in Canada.

Contrary to recent American and Canadian guidelines,[8,9] treatment for latent tuberculosis infection was rarely offered to persons who should be among the highest risk for future development of TB. Most persons referred for medical surveillance have fibrotic changes on chest x-ray and would be considered good candidates for treatment. In Australia, one study showed that 5% of immigrants screened were offered treatment.[16] Some immigrant screening programs have been able to achieve significantly higher rates of treatment for LTBI, which may reflect the provision of good primary medical care and a well-organized and motivated program.[17,18] The key factor in the success of these programs (with 63% referral for treatment) appeared to be the assignment and training of a specific staff person to manage the tracking and follow-up of clients needing and receiving treatment for LTBI.[18]

Poor adherence may also have been caused by delays in or lack of notification by CIC. Another recent unpublished study[19] by the authors has shown that notification rates of the provincial public health authorities of persons referred for medical surveillance are less than 60%. Often health units were given addresses that were provided at the time of immigration but that on follow-up proved to be incorrect or invalid. By working in conjunction with the Ontario Health Insurance Program (OHIP), it may be possible to obtain a more accurate address and improve follow-up.

This is the first definitive study of the Ontario medical surveillance program. The study included only those persons who were classified for medical surveillence and were later diagnosed with active TB. As such, it does not include those who were classified for surveillance and did not develop TB, nor does it include those who may have developed active TB and were not yet diagnosed. The evaluation of the surveillance program is complicated by the fact that medical surveillance requirement is not routinely captured with a notification of TB. To gather medical surveillance classification, it was necessary to link back to the immigration file. As well there is no routine collection of information on this group nor standard protocols for management. Currently there is variable funding and attention paid to the medical surveillance of immigration based on funding decisions made at the municipal level. It could be argued that such an issue with potential impact on the Canadian population as a whole should not be subject to the whims of municipal funding.

Unlike many other provinces in Canada, Ontario does not have centralized TB clinics. As a result, high-risk immigrants may be evaluated in the primary care setting. Physicians who may have relatively little understanding of TB may be the only decision-makers in the evaluation and management of such persons. A surveillance system in which few high-risk patients are offered a risk-reducing intervention is highly unlikely to be cost-effective,[11] and may lead to an erroneous belief that the risk of TB transmission is being adequately managed. Timely and adequate medical evaluation and follow-up of immigrants who are at high risk for the reactivation of TB can have a relatively high yield.[2,5,10,12,17] Failing to provide effective surveillance may place the Canadian population at risk.

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RÉSUMÉ

Contexte : Le ministère de la Citoyenneté et de l'Immigration (CIC) prévoit un dépistage de la tuberculose chez les immigrants et autorise les personnes atteintes de tuberculose pulmonaire latente à entrer au Canada à condition qu'elles se soumettent à une surveillance médicale. Nous avons étudié ce programme en Ontario.

Méthode : Nous avons recoupé les données nationales et provinciales d'une base de données de gestion.

Résultats : En 1994-1995, on a diagnostiqué 1 341 cas de tuberculose active dans la population née à l'étranger, et 1 095 de ces cas étaient répertoriés par CIC. Notre analyse a porté sur 142 des 149 personnes (14 %) placées sous surveillance médicale par CIC. Une proportion significative de ces personnes (39/142 : 27 %) avaient été diagnostiquées avant ou durant le dépistage exigé par l'immigration. Elles étaient entrées au Canada en qualité de visiteurs ou de réfugiés. Seules 21 des 103 personnes restantes (20 %) ayant fait l'objet d'un dépistage de l'immigration avant leur diagnostic de tuberculose respectaient l'obligation de se soumettre à une surveillance médicale. La plupart (82/103 : 82 %) présentaient des symptômes, mais 1 seule des 16 personnes admissibles (6 %) était traitée pour une tuberculose latente, ce qui suggère que la tuberculose a pu se propager en Ontario.

Interprétation : Le système de surveillance de la tuberculose en vigueur en Ontario pour les immigrants très vulnérables ne parvient pas à détecter et à traiter les infections latentes, ni donc à prévenir les cas futurs.

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Zumla et Grange vont même jusqu'à dire que ne pas le faire est immoral.[24] On retrouve ce même point de vue dans un article récent qui fait ressortir les inégalités dans la richesse et les services de santé selon les régions du monde et dans lequel nous sommes invités à réfléchir « aux activités locales et internationales susceptibles d'améliorer le bien-être et la santé au niveau mondial ». [25]

Le Canada est signataire du récent « Communiqué Okinawa 2000 du G8 » dans lequel les huit principales démocraties du monde industrialisé s'engagent à « réduire la morbidité due à la tuberculose et la prévalence de la maladie de 50 % d'ici 2010 ». Ce Communiqué relance l'esprit de la Déclaration d'Alma Ata de l'Organisation mondiale de la Santé, « La Santé pour tous en l'an 2000 »,[26] et nous devrions nous efforcer de dépasser cet objectif s'agissant de la tuberculose.

En conclusion, si l'on veut contrôler et finalement éradiquer la tuberculose au Canada, il faut s'attaquer à la maladie au sein de la population immigrée. Les programmes actuels de dépistage ne permettent de détecter que de 10 à 14 % des immigrants qui plus tard développeront la maladie. Les politiques de chimioprophylaxie actuelles sont chères et inefficaces. Notre objectif d'éradication de la tuberculose au Canada sera plus facilement atteint en mettant au point de nouveaux programmes et en débloquant de nouveaux crédits. Dans le meilleur des cas, et en définitive, ces nouveaux programmes doivent s'attaquer à la tuberculose dans le monde et ne pas être de simples opérations locales, coûteuses et largement superficielles.