The California Multidrug-Resistant Tuberculosis Consult Service: a partnership of state and local programs

N. S. Shah,^{1,2} J. Westenhause,² P. Lowenthal,² G. Schecter,^{2,3} L. True,² S. Mase,¹ P. M. Barry,² J. Flood²

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Background: The US Centers for Disease Control and Prevention recommend expert consultation for multidrug-resistant tuberculosis (MDR-TB) cases. In 2002, the California MDR-TB Service was created to provide expert MDR-TB consultations. We describe the characteristics, treatment outcomes and management of patients referred to the Service.

Methods: Surveillance data were used for descriptive analysis of cases, with consultation during July 2002–December 2012. Clinical consultation data and modified World Health Organization indicators were used to assess the care and management of cases, with consultation from January 2009 to December 2012.

Results: Of 339 MDR-TB patients, 140 received a consultation. The proportion of patients receiving a consultation increased from 12% in 2002 to 63% in 2012. There were 24 pre-extensively drug-resistant TB and 5 patients with extensively drug-resistant TB. The majority ($n = 123$, 88%) completed treatment, 5 (4%) died, 7 (5%) moved before treatment completion, 4 (3%) stopped treatment due to an adverse event and 1 (1%) had an unknown outcome. Indicator data showed that 86% underwent rapid molecular drug susceptibility testing, 98% received at least four drugs to which they had known or presumed susceptibility, and 93% culture converted within 6 months.

Conclusions: Consultations with the MDR-TB Service increased over time. Results highlight successful treatment and indicator outcomes.

Multidrug-resistant tuberculosis (MDR-TB) is more challenging to manage than drug-susceptible TB, and treatment lasts for 18–24 months with four to six drugs. To minimize poor outcomes and treatment morbidity, US guidelines encourage consultation with MDR-TB experts.¹ Several models for providing expert consultation have been described previously, but none for ongoing MDR-TB consultation in the United States.^{2–6} We report on California's model for providing expert consultation.

California reports 25% of the MDR-TB cases diagnosed in the United States.^{7,8} Each of California's 61 local health jurisdictions oversees their own TB control activities. Because MDR-TB is infrequent, programs may have limited clinical familiarity with MDR-TB. In 2002, the California Department of Public Health (CDPH) Tuberculosis Control Branch (TBCB) conducted an MDR-TB needs assessment. Needs identified were clinical and case management consultation, MDR-TB resources, and contact investi-

gation tools. To respond to these needs and ensure access to MDR-TB experts, the TBCB launched the California MDR-TB Service in 2002.

The objectives of the present report were to describe the MDR-TB Service, the characteristics and treatment outcomes of patients referred to the Service, and to assess if patients were receiving recommended treatment using modified World Health Organization (WHO) MDR-TB indicators.^{9–12}

Description of the MDR-TB Service

The MDR-TB Service is composed of a multidisciplinary team from the CDPH TBCB that contribute part of their time; it comprises 3 physicians, 3 registered nurses, 1 epidemiologist, and 1 administrative coordinator, who together are equivalent to three full-time staff. As requested in the needs assessment, the Service created several tools to support consultation and track patient progress (Appendix). In partnership with the Curry International Tuberculosis Center (San Francisco, CA, USA), the Service developed and revised a best practices resource for providers entitled 'Drug-resistant tuberculosis: a survival guide for clinicians'.¹³

When notified of newly identified MDR-TB results by the state Microbial Disease Laboratory, the Service contacts the relevant program to offer its consultation service. Programs can choose between full, focused and no consultation (Appendix). Full consultation includes initial and monthly written formal recommendations regarding treatment and side effect monitoring during the intensive phase. During the continuation phase, local TB programs send quarterly treatment summaries using a standardized form through secure e-mail. Monthly teleconferences consist of a multidisciplinary team including the primary provider, the local TB program, and the Service. Focused consultations are held when local TB programs contact the Service with specific questions as needed.

The Service also provides consultations for complex non-MDR-TB patients, and provides assistance with obtaining anti-tuberculosis medications, interpreting and obtaining laboratory testing, and fiscal resources. Patient data are shared using secure e-mail or facsimile. Consultation is provided remotely using e-mail and telephone conferencing. Consultations for patients diagnosed with MDR-TB after 2008 have been systematically entered into an MDR-TB clinical consultation database. Data for non-MDR-TB patients and those from before 2008 are stored in electronic or paper charts.

AFFILIATIONS

- 1 Division of Tuberculosis Elimination, National Center for HIV, Viral Hepatitis, STI and TB Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia, USA
- 2 California Department of Public Health, Tuberculosis Control Branch, Richmond, California, USA
- 3 University of California, San Francisco, California, USA

CORRESPONDENCE

Neha S Shah
Tuberculosis Control Branch
California Department of Public Health
850 Marina Bay Parkway
Richmond, CA 94804
USA
e-mail: neha.shah@cdph.ca.gov

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KEY WORDS

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FIGURE Number of MDR-TB cases reported and proportion of reported cases that received a full or focused consultation, California, USA, July 2002–December 2012. Full consultation = MDR-TB Service provided a formal initial written consultation and at least one follow-up written recommendation; focused consultation = local TB program received assistance either electronically or verbally once or many times without a formal initial consultation. MDR-TB = multidrug-resistant tuberculosis.

METHODS

Inclusion criteria

All culture-positive MDR-TB patients reported to the California surveillance system who were alive at the time of diagnosis from July 2002 through 2012 and whose provider received a consultation from the MDR-TB Service were included in the descriptive analysis. Indicator analyses were limited to patients who received a consultation from 2009 to 2012, as the MDR-TB clinical consultation database includes only patients diagnosed after 2008. Sputum culture conversion analyses were limited to patients with pulmonary MDR-TB.

Definitions

MDR-TB was defined as having growth-based assay results showing resistance to INH and RMP on initial report or acquired during treatment.¹³ Extensively drug-resistant TB (XDR-TB) was defined as MDR-TB plus resistance to a second-line injectable medication and a fluoroquinolone.¹³ Pre-XDR-TB was defined as MDR-TB plus resistance to a second-line injectable medication or a fluoroquinolone.¹³ We defined a case as having full consultation if the MDR-TB Service provided the local TB program with a formal initial written consultation and at least one follow-up written recommendation. An MDR-TB regimen was defined as a regimen containing four drugs, at least two of which were second-line drugs (defined as any drug except INH, RMP, ethambutol and pyrazinamide).¹⁴ The time to the start of an MDR-TB regimen was defined as the number of days between the date a specimen was collected for drug susceptibility testing (DST) and the start date of the second second-line anti-tuberculosis drug to which there was known or presumed susceptibility. The duration of the intensive phase was calculated using the start and stop dates of the second-line injectable medication.^{10,13} Culture conversion was defined as at least one negative sputum culture with no subsequent positive cultures.¹⁵ We stratified local TB programs into three categories based on the average annual number of TB cases reported from 2002 to 2012: 0–10, 11–50, and >50 cases per year.

Multidrug-resistant tuberculosis care and management indicators

We modified the WHO MDR-TB care and management indicators to be applicable for settings where treatment regimens are indi-

visualized based on DST.^{9–12} We selected the following indicators for this evaluation: 1) rapid molecular DST performed at least once; 2) initial MDR-TB treatment regimen consisting of at least four drugs to which the organism was known or presumed to be susceptible; 3) intensive phase duration of at least 6 months after sputum culture conversion, or 6 months total for extra-pulmonary MDR-TB; 4) total treatment duration of at least 18 months after sputum culture conversion or a total of 18 months for extra-pulmonary MDR-TB; and, 5) in cases of pulmonary MDR-TB, sputum culture conversion to negative within 6 months of treatment initiation. Any anti-tuberculosis drug that was started and stopped within the first 60 days after the initial specimen collection was excluded to account for the use of the standard four-drug treatment while awaiting DST results.

Data collection and analysis

MDR-TB Service patients were matched with the California TB Registry. DST results, medications, and treatment outcomes were abstracted from Service charts and the TB Registry. Demographic and clinical characteristics such as sputum smear, culture conversion, radiographic results, directly observed therapy (DOT) and human immunodeficiency virus (HIV) results were obtained from the TB Registry. Analyses for this report were conducted using SAS v9.3 (Statistical Analysis System, Cary, NC, USA) and Microsoft Access 2010 (Microsoft, Redmond, WA, USA).

Ethics review

The project was determined not to be human subjects research by the US Centers for Disease Control and Prevention (Atlanta, GA, USA) and the California Health and Human Services Agency Committee for the Protection of Human Subjects (Sacramento, CA, USA). This analysis was conducted as part of the California Department of Public Health's mandate to routinely collect and analyze data for public health program activity including service delivery and program evaluation.

RESULTS

From July 2002 to December 2012, 339 MDR-TB cases were reported to the California TB Registry. Of these, providers of 140

(41%) MDR-TB patients received a consultation from the MDR-TB Service. The majority of the MDR-TB patients were born outside the United States ($n = 130$, 93%) and had not been previously treated for TB ($n = 104$, 74%). There were 128 (91%) patients with pulmonary disease only. Among those with pulmonary TB, 47 (34%) had a cavitary lesion on chest X-ray, and 85 (63%) were sputum smear-positive. Resistance to more than INH and RMP was documented in 59 (42%) patients, 139 (99%) received DOT or a mixture of DOT and self-administered therapy, and 89 (64%) were treated by the DOH. A total of 123 (88%) MDR-TB patients completed treatment, 5 (5%) died during treatment, 7 (5%) moved before treatment completion, 4 (3%) stopped due to adverse events and 1 (1%) had an unknown outcome. Three of the four patients who stopped treatment due to adverse events received at least 12 months of treatment and two had 12 months of treatment after culture conversion; none have needed retreatment to date.

Of the 140 MDR-TB patients with consultations, 102 (73%) received a full consultation session and 38 (27%) received focused consultations. The proportion of MDR-TB case patients reported to the registry with an MDR-TB Service consultation increased from 12% ($n = 3$) in 2002 to 62.5% ($n = 10$) in 2012 (Figure). Although TB programs that reported an average of >50 TB cases/year received 71% of the consultations, this proportion represented consultation on 31% of all their MDR-TB patients reported during this time period. Programs with 0–10 TB cases/year received 14% of the consultations, representing 95% of their MDR-TB patients. Programs with 11–50 cases/year received 15% of the consultations, representing 80% of all their MDR-TB patients (Table 1). Forty non-MDR-TB patients received a consultation.

Multidrug-resistant tuberculosis indicators

Among the 140 consultations, 64 (46%) took place between 2009 and 2012, 51 (80%) of which were full consultations (Table 2). Among the full consultations, 47 (92%) patients had pulmonary MDR-TB. All cases with a full consultation were treated with ≥ 4 drugs to which they had presumed or known susceptibility and 88% ($n = 45$) received rapid molecular DST. The median duration of the intensive phase was approximately 7 months. The median total duration of treatment was 19.7 and 18.5 months for pulmonary and extra-pulmonary TB, respectively. Of the 15 patients who did not complete the 6-month intensive phase, 8 (53%) had a documented adverse effect from the injectable medication. Among the 46 full consultation cases with pulmonary disease who had documented culture conversion, 45 (98%) culture converted within 6 months (median 35 days) of MDR-TB treatment initiation. Of the 51 full consultation cases, 44 (86%) completed treatment, 5 moved and 2 stopped treatment due to adverse events.

Data on medication utilization for the full consultation cases were available for 50 patients. Fluoroquinolones ($n = 47$, 94%) and second-line injectables ($n = 48$, 96%) were most frequently used. Moxifloxacin was used more often than levofloxacin, and amikacin more frequently than capreomycin (Table 3). Cycloserine, para-aminosalicylic acid and linezolid were used in respectively 78%, 62%, and 56% of the patients. (Table 3). Two patients received clofazimine (Table 2).

All of the 13 cases with focused consultation during 2009–2012 had pulmonary disease. Twelve cases (92%) received four drugs to which they had known or presumed susceptibility and 77% ($n = 10$) underwent rapid molecular DST. All cases converted to culture-negative within 6 months (median 33 days) of MDR-TB treatment initiation, and the median total duration of treatment for those with documented treatment outcomes ($n = 10$) was 22.5

TABLE 1 Demographics, clinical characteristics, and treatment outcomes of patients referred to the MDR-TB Service for consultation, 2002–2012

Characteristics	Patients <i>n</i> (%)
Total	140
Consultation type	
Full	102 (73)
Focused	38 (27)
Male	76 (54)
Age, years, median (range)	36 (7–89)
Foreign-born	130 (93)
Country of origin of foreign-born cases	
Philippines	22 (17)
Mexico	21 (16)
Viet Nam	16 (12)
India	12 (9)
China	7 (5)
Other	52 (40)
HIV-positive	1 (0.7)
Previous anti-tuberculosis treatment	
Yes	35 (25)
No	104 (74)
Unknown	1 (0.7)
Site of disease	
Pulmonary only	128 (91)
Extra-pulmonary only	5 (4)
Both pulmonary and extra-pulmonary	7 (5)
Chest X-ray*	
Normal	9 (6)
Abnormal, with cavitary lesion	47 (34)
Abnormal, with no cavitary lesions	82 (59)
Not done	2 (1)
Sputum smear results*	
Positive	85 (61)
Negative	54 (39)
Not done	1 (0.7)
Extent of resistance (mutually exclusive categories)	
MDR-TB only	81 (58)
Resistant to all first-line medications	30 (21)
Pre-XDR-TB	24 (17)
XDR-TB	5 (4)
DOT	
Total DOT	81 (58)
Both DOT and SAT	58 (41)
SAT only	1 (0.7)
Unknown	0 (0)
Local jurisdiction TB morbidity (average cases per year)	
0–10	21 (14)
11–50	20 (15)
>50	99 (71)
Patient outcome	
Completed treatment	123 (88)
Moved before treatment completion	7 (5)
Died	5 (4)
Stopped treatment due to adverse event	4 (3)
Unknown	1 (1)

* Among those with pulmonary TB ($n = 135$).

MDR-TB = multidrug-resistant tuberculosis; HIV = human immunodeficiency virus; XDR-TB = extensively drug-resistant TB; DOT = directly observed therapy; SAT = self-administered therapy.

TABLE 2 MDR-TB indicators for cases who received a California MDR-TB Service consultation, 2009–2012

Characteristics	Full consult* (n = 51) n (%)	Focused consult† (n = 13) n (%)
Site of disease		
Pulmonary	47 (92)	13 (100)
Extra-pulmonary	4 (8)	0
Treated with four drugs with known or presumed susceptibility	51 (100)	12 (92)
Rapid drug susceptibility testing done	45 (88)	10 (77)
Other medical conditions		
Presence of immunosuppressive condition‡	4 (8)	0
Diabetes mellitus	7 (14)	4 (31)
Time to MDR-TB treatment initiation, days, median [IQR]	34 [11 to 58]	34 [21 to 52]
Pulmonary MDR-TB cases		
Duration of intensive phase, months, median [IQR]§	6.6 [6.0 to 8.4]	NA
Continued injectable medication for ≥6 months after culture conversion¶	27 (61)	NA
Duration of treatment, months, median [IQR]#	19.7 [18.7 to 23.8]	22.5 [19.3 to 24.9]
Continued treatment ≥ 18 months after culture conversion**	35 (90)	8 (89)
Time to sputum culture conversion after MDR-TB treatment initiation, days, median [IQR]††	34.5 [13.5 to 59.5]	33 [–11 to 69]
Sputum culture converted within 6 months of initiation of MDR-TB regimen††	45 (98)	13 (100)
Extra-pulmonary MDR-TB		
Duration of intensive phase, months, median [IQR]§	6.1 [5.5 to 6.3]	
Duration of therapy, months, median [IQR]#	18.5 [18.3 to 18.8]	NA
DOT		
Total DOT	31 (61)	9 (69)
Both DOT and SAT	20 (39)	4 (31)
SAT only	0	0
Treatment outcomes		
Completed	44 (86)	10 (77)
Moved	5 (10)	1 (8)
Died	0	1 (8)
Adverse event	2 (4)	1 (8)

*MDR-TB Service provided a formal initial written consultation and at least one follow-up written recommendation.

†Local TB program received assistance either electronically or verbally once or many times without a formal initial consultation.

‡Includes immunosuppression associated with receiving anti-tumor necrosis factor- α treatment ($n = 1$), receiving solid-organ transplant ($n = 1$), or other immunosuppressive condition ($n = 2$). No patients were living with HIV.

§Among those receiving an injectable medication with treatment start and stop dates (pulmonary, $n = 44$; extra-pulmonary, $n = 4$).

¶Among those receiving an injectable medication with treatment start and stop dates and culture conversion documented ($n = 44$).

#Among those completing treatment (pulmonary cases: full consultations: $n = 40$, focused consultations: $n = 10$; extra-pulmonary cases: full consultations: $n = 4$, focused consultations: $n = 0$).

**Among those completing therapy and with documented culture conversion (full consultations: $n = 39$, focused consultations: $n = 10$).

††Among those with culture conversion data. MDR-TB regimen is defined as starting at least 2 drugs with known susceptibility (full consultations: $n = 46$; focused consultations: $n = 13$).

MDR-TB = multidrug-resistant tuberculosis; IQR = interquartile range; DOT = directly observed therapy; SAT = self-administered therapy.

months. Ten (77%) MDR-TB cases completed therapy, 1 moved, 1 died, and 1 stopped treatment due to an adverse event.

DISCUSSION

The California MDR-TB Service has had increasing numbers of requests for consultation since implementation. TB programs with >50 TB cases/year consulted the Service less often, possibly because they have local expertise. Maintaining expertise in MDR-TB treatment and management is challenging, as fewer than 100 MDR-TB cases are reported annually in the United States. The CDC therefore recommends expert consultation for MDR-TB cases.^{1,8} There is currently no standardized method for providing expert TB consultation, and several models have been described for TB and other infectious diseases.^{3–5,16–18} The California MDR-TB Service was created to ensure access to MDR-TB expertise statewide. The increasing use of the service suggests a continued need for MDR-TB experts and consultation services.

In our study cohort of California MDR-TB patients, treatment completion was high, at 88%, compared to 78% for the whole of the United States and 67% in California before the MDR-TB Service.^{19,20} These successful outcomes were achieved among patients who had isolates with substantial resistance (42% with resistance beyond INH and RMP). Few patients ($n = 7$, 5%) moved before treatment completion, and mortality was low, at 4%, compared to 9% reported among US MDR-TB patients.^{20,21} Mortality was also lower in this cohort than that reported among California MDR-TB patients from 1994 to 2002 (14%), and also lower than among California non-MDR-TB cases in 2014 (7.4%).^{7,19,20,22,23}

Our cohort of MDR-TB patients had a median age of 26 years; only one patient was living with HIV. These demographic characteristics are different from data reported on California patients with MDR-TB from 1994 to 2002 (median age 42 years, 4% living with HIV), suggesting a potential change in the characteristics of California MDR-TB patients.¹⁹ In our previous report, 15% of patients with MDR-TB received self-administered therapy compared

TABLE 3 Anti-tuberculosis drugs and treatment duration among cases with a full consultation from the California MDR-TB Service, 2009–2012

Medication	Patients receiving medication at any time during treatment* (n = 50) n (%)	Treatment duration, days median [IQR]
INH†	12 (24)	61 [44–71]
Ethambutol	31 (62)	468 [113–571]
Pyrazinamide	32 (64)	408 [89–564]
Rifampin	13 (26)	61 [51–91]
Rifabutin	3 (6)	144 [12–540]
Any injectable	48 (96)	
Amikacin	36 (72)	192 [154–236]
Capreomycin	11 (22)	187 [82–326]
Kanamycin	1 (2)	4
Streptomycin	9 (18)	166 [141–195]
Any fluoroquinolone	47 (94)	
Levofloxacin	18 (36)	237 [78–546]
Moxifloxacin	42 (84)	500 [276–581]
Clofazimine	2 (4)	381 [315–447]
Cycloserine	39 (78)	548 [150–699]
Ethionamide	20 (40)	173 [43–521]
Imipenem	1 (2)	15
Linezolid	28 (56)	328 [156–466]
Para-aminosalicylic acid	31 (62)	542 [0–777]

*Any anti-tuberculosis drug that was started and stopped within the first 60 days after the initial specimen collection was excluded from this analysis to account for the use of standard four-drug treatment while awaiting drug susceptibility testing results. First-line drugs stopped >60 days after specimen collection are included.

†Two patients received a higher INH dose than the standard 300 mg.

MDR-TB = multidrug-resistant tuberculosis; IQR = interquartile range; INH = isoniazid.

to 0.7% in the present cohort.¹⁹ DOT is the standard of care for MDR-TB treatment, and the change to providing more DOT for MDR-TB patients is encouraging.

Across all indicators, performance was high, with most indicators reaching WHO targets. The median time to culture conversion was approximately 1 month. Rapid culture conversion helps to reduce the risk of MDR-TB transmission. Most cases met the target for treatment duration following culture conversion both for injectables and for overall treatment. Given the toxicity of the medications and the reported frequency of side effects, we expected some patients to discontinue treatment before the indicator targets were met.^{20,24,25} Of the nine cases who did not undergo rapid molecular DST, eight were born in countries with high rates of resistance, which should have prompted the request for rapid molecular DST. The Service should continue to educate and encourage the use of rapid molecular DST to ensure prompt treatment with drugs to which the patients are presumed to be susceptible.^{14,26–28}

Our evaluation was subject to a number of limitations. Because we did not have data on the treatment regimens or laboratory results for patients who did not receive a consultation, we did not include these patients in this analysis. We could not therefore compare whether indicator measurements were influenced by MDR-TB Service support. However, we did stratify our analysis by consultation type. Focus consultations had varying levels of interactions, ranging from one consultation session to several, ongoing consultations. Our analysis may be subject to a selection bias because local programs are not required to consult the Service.

We did not collect data on why programs requested consultation or chose not to request consultation. Local TB programs may be more likely to request consultation for more complicated MDR-TB cases with extensive resistance, making our cohort more complex than the overall MDR-TB cohort in California.

As numbers of TB cases and public health resources continue to decline, expertise at the local level in treating MDR-TB will also decline. With the introduction of new MDR-TB diagnostics and medications, the need for expert consultation is crucial. This state-based multidisciplinary partnership model has been successful in California, and is a strategy for achieving the public health goals of reducing the morbidity, mortality, and transmission of MDR-TB. As various models emerge as a method of providing remote expert consultation for a wide variety of diseases,^{29–31} the MDR-TB Service model can serve as a foundation for what is needed to provide ongoing expert consultation for MDR-TB cases for low-, middle- and high-burden countries.

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APPENDIX

TABLE A The California MDR-TB Service

Staff members contributing part of their time included 3 physicians, 3 registered nurses, 1 epidemiologist, and 1 administrative coordinator
Tools created to support consultation and track patient progress (all available in the guide ‘Drug-resistant tuberculosis: a survival guide for clinicians’):¹³

- MDR-TB Monitoring Checklist, recommending monthly monitoring recommendations based on an individual’s MDR-TB treatment regimen
- Treatment regimen tracking form (Drug-o-Gram)
- Radiology results sheet
- Laboratory flow sheet
- Bacteriology flow sheet
- Vision screening flow sheet

Consultation services

- Full consultation
 - Initial and monthly formal written recommendations regarding treatment and side effect monitoring
 - Assistance with contact investigation
 - Interpretation of laboratory tests, including molecular testing and growth-based DST
 - Monthly review of radiology, laboratory testing, clinical evaluations, and microbiology results
- Focused
 - Written recommendations on specific questions as needed
 - Review as needed of radiology, laboratory testing, clinical evaluations, and microbiology results

Other services

- Consultation for complex non-MDR-TB patients
- Assistance with obtaining anti-tuberculosis medications, laboratory testing, fiscal resources, and with determining isolation needs

In 2011, a supplemental MDR TB surveillance report form was introduced to collect data on second-line DST, molecular DST, initial MDR-TB treatment regimen and aggregate data on MDR-TB case contacts

MDR-TB = multidrug-resistant tuberculosis; DST = drug susceptibility testing.

Contexte : Les Centers for Disease Control and Prevention des Etats Unis recommandent de consulter un expert en cas de tuberculose multirésistante (TB-MDR). En 2002, le California MDR-TB Service a été créé afin de fournir une consultation d’experts en TB-MDR. Nous décrivons les caractéristiques, les résultats du traitement et la prise en charge des patients référés vers ce service.

Méthode : Les données de surveillance ont été utilisées pour une analyse descriptive des cas ayant eu une consultation entre juillet 2002 et décembre 2012. Les données de consultation clinique et les indicateurs modifiés de l’Organisation Mondiale de la Santé ont été utilisés afin d’évaluer la prise en charge des cas qui ont bénéficié d’une consultation entre janvier 2009 et décembre 2012.

Résultats : Sur 339 patients TB-MDR, 140 ont bénéficié d’une

consultation. Cette proportion est passée de 12% en 2002 à 63% en 2012. Il y a eu 24 patients TB pré-ultrarésistante et 5 patients TB ultrarésistante. La majorité ($n = 123$; 88%) a achevé le traitement, 5 (4%) sont décédés, 7 (5%) ont déménagé avant la fin du traitement, 4 (3%) ont arrêté le traitement à cause d’un effet secondaire et 1 (1%) a eu un résultat inconnu. Les indicateurs ont montré que 86% avaient bénéficié d’un test de pharmacosensibilité moléculaire rapide, que 98% avaient reçu au moins quatre médicaments avec une sensibilité connue ou présumée et que 93% ont eu une conversion de culture dans les 6 mois.

Conclusion : Les consultations au service de TB-MDR ont augmenté dans le temps. Nous avons mis en lumière les bons résultats du traitement et des indicateurs.

Marco de referencia: Los Centros para el Control y la Prevención de Enfermedades de los Estados Unidos recomiendan que se recurra a la consulta con expertos en los casos de tuberculosis multirresistente (TB-MDR). En el 2002, se creó el California MDR-TB Service en California, con el objeto de proveer consultas de expertos en la materia. En el presente estudio se describen las características, los desenlaces terapéuticos y el tratamiento de los pacientes remitidos a este servicio.

Métodos: Se utilizaron los datos de la vigilancia en el análisis descriptivo de los casos que consultaron el Servicio de julio del 2002 a diciembre del 2012. A partir de la base de datos de la consulta y los indicadores modificados de la Organización Mundial de la Salud se evaluó la atención y el tratamiento de los casos que consultaron de enero del 2009 a diciembre del 2012.

Resultados: De los 339 pacientes con diagnóstico de TB-MDR, 140 obtuvieron la consulta de expertos. La proporción de pacientes con

una consulta aumentó de un 12% en el 2002 al 63% en el 2012. Se atendieron 24 pacientes con TB pre-ultrarresistente y cinco pacientes con TB ultrarresistente. La mayoría completó el tratamiento ($n = 123$; 88%), 5 pacientes fallecieron (4%), 7 se mudaron antes de haber completado el tratamiento (5%), 4 interrumpieron el tratamiento debido a una reacción adversa (3%) y se desconoció el desenlace de 1 paciente (1%). Según los datos de los indicadores, en 86% de los casos se practicaron pruebas moleculares rápidas de sensibilidad a los medicamentos, el 98% de pacientes recibió como mínimo cuatro fármacos con sensibilidad confirmada o supuesta y el 93% de los pacientes había convertido el cultivo en un lapso de 6 meses.

Conclusión: Las consultas al Servicio de expertos en TB-MDR han aumentado con el transcurso del tiempo. Los resultados del estudio ponen de manifiesto la eficacia del tratamiento y revelan indicadores de evolución muy favorables.