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Multidrug-resistant tuberculosis in Bangladesh: results from a sentinel surveillance system

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SUMMARY

BACKGROUND: Multidrug-resistant tuberculosis (MDR-TB) is a serious obstacle to successful TB control. The 2010–2011 Bangladesh Drug Resistance Survey (DRS) showed MDR-TB prevalence to be 7% overall, 1.4% in new and 28.5% in previously treated patients. We aimed to determine the rate of MDR-TB in selected sentinel sites in Bangladesh.

METHODS: Fourteen hospitals from the seven divisions in Bangladesh were selected as sentinel surveillance sites. Newly registered TB patients were systematically enrolled from August 2011 to December 2014. Sputum specimens were processed for culture and drug susceptibility testing by the proportion method using Löwenstein-Jensen medium.

RESULTS: Specimens from 1906 (84%) of 2270 enrolled patients were analysed. Isolates from 61 (3.2%) were identified as having MDR-TB. The proportion of MDR-TB was 2.3% among new and 13.8% among previously treated TB patients ($P < 0.001$). The overall proportion of MDR-TB was 3.2%:3.5% in males and 2.3% in females; by age, the MDR-TB rate was highest (5.2%) in those aged ⩾65 years.

CONCLUSIONS: The high proportion of MDR-TB among new patients found in this sentinel surveillance significantly differs from that reported in the DRS. While the sentinel surveillance sites were not designed to be nationally representative, it is worrying to observe a higher number of MDR-TB cases among new patients.

KEY WORDS: multidrug-resistant tuberculosis; Bangladesh; surveillance; drug resistance

TUBERCULOSIS (TB) control activities by national TB control programs (NTPs) worldwide have been threatened by the emergence of drug-resistant TB, especially multidrug-resistant TB (MDR-TB).[1,2] Globally, an estimated 3.3% of new patients and 20% of previously treated patients have MDR-TB.[3] However, of the estimated MDR-TB cases that occurred, only 123 000 were notified, and only 111 000 were started on treatment.[3] Failure to identify and treat MDR-TB is more than a clinical travesty, it is a potential public health catastrophe: the risk of transmission of MDR-TB is high when there are undetected and untreated cases in the community.[4]

Only 72 countries have established continuous surveillance based on routine diagnostic drug susceptibility testing (DST) of all TB patients. The rest rely on surveys, only some of which are nationally representative, as a source of periodic MDR-TB data. Bangladesh is one of the 13 countries with both a high TB and a high MDR-TB burden, and the country has limited data on MDR-TB.[3] A community-based survey in Bangladesh reported that among identified TB patients in 2004, 48.4% of *Mycobacterium tuberculosis* isolates were resistant to at least one of the first-line anti-tuberculosis drugs, while multidrug resistance was observed in 5.5% of isolates.[5] In two different studies involving specific risk groups, the MDR-TB rate was 2% among inmates of the largest central jail of Bangladesh,[6] and 5% among those from a densely populated urban slum in Dhaka City.[7] Another hospital-based study in Dhaka conducted in the 1990s revealed an MDR-TB rate of 5% among TB patients.[8] Bangladesh completed its first nationwide survey on MDR-TB in 2011, which found an MDR-TB prevalence of 7% overall, 1.4% in new patients and 28.5% in previously treated TB patients.[9]

Information on drug resistance allows comparisons of drug resistance across settings and within settings over time, identification of patterns of drug resistance in different groups of patients, and detection of localised outbreaks of MDR-TB.[10] The objectives of this sentinel surveillance study were to determine the proportion of new and previously treated sputum

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smear-positive pulmonary patients with MDR-TB and to investigate risk factors associated with developing drug resistance in selected sentinel sites in Bangladesh.

METHODS

Ethics and consent

The study protocol was reviewed and approved by the Research Review Committee and the Ethical Review Committee of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), Dhaka, Bangladesh, and by the Institutional Review Board at the US Centers for Disease Control and Prevention, Atlanta, GA, USA. Participants were enrolled in the study only after providing informed written consent.

Setting and study period

Participating facilities were chosen for this study for convenience: all 12 facilities from the Influenza Sentinel Surveillance Network, which were initially randomly selected in 2007, were included, as were two additional governmental facilities with whom icddr,b has a longstanding relationship. All 14 health facilities perform routine sputum smear microscopy and are linked to the Bangladesh NTP; at least one health facility from each of the seven divisions in Bangladesh was included. Nine of the health facilities are government facilities and the remaining five are private facilities. The sentinel surveillance started at these sites in August 2011 and is ongoing. The analysis in this article covers the period from August 2011 to December 2014.

Sample collection personnel

A surveillance team formed by icddr,b included one field assistant for each of the 14 health facilities, led by one medical officer. The team was trained on the surveillance protocol, procedures and then assigned to collect samples and study-specific patient information. The field assistants were responsible for data collection and coordination of sample collection and transport.

Sampling and enrolment

The sentinel surveillance was designed according to the World Health Organization's (WHO's) guidelines for surveillance of drug resistance in tuberculosis.[10] The surveillance was designed to measure resistance in newly registered episodes of TB among new and/or previously treated cases. All newly registered persons with smear-positive pulmonary TB identified at the participating health facilities were eligible to participate. The enrolled cases in the sentinel surveillance included both new cases and cases that were previously treated (relapse, failure or lost to follow-up) and considered as 'newly registered previously treated cases'. Eligible participants were systematically sampled based on the true proportional distribution of selected sentinel sites, with selection of every second or every fifth eligible patient depending on the individual health facility and the number of monthly eligible pulmonary TB patients detected, so that their contribution to the case load matches the actual contribution of the patients enrolled in the surveillance. Persons were excluded from participation if they were already on anti-tuberculosis treatment at the time they presented to a microscopy centre for testing.

Patient information

Demographic and clinical data and previous treatment history were collected from the enrolled participants. The patients were also asked about current or past history of smoking, alcohol consumption, diabetes, and known contact with a TB patient. Enrolled patients were classified as 'new' if they denied having had any previous anti-tuberculosis treatment for >1 month, and as 'previously treated' if they acknowledged having been treated for TB for $\geqslant 1$ month. Field assistants in the surveillance team were trained in the proper classification of treatment history based on patient responses and in reviewing available treatment documents from previous TB episodes to ensure proper and accurate interpretation of surveillance data. The history-taking process was also frequently checked by senior members of the surveillance team to ensure quality.

Sputum collection, processing and transport

An additional 3–5 ml specimen (spot) was collected before initiating anti-tuberculosis treatment. Sputum samples were immediately refrigerated at +4°C after collection and transported to icddr,b's Mycobacteriology Laboratory in an ice box within 24 h of collection.

Drug susceptibility testing

Sputum specimens were decontaminated following Petroff's sodium hydroxide method,[11] and then concentrated following methods described previously.[12] Löwenstein-Jensen (LJ) solid medium was used for *M. tuberculosis* culture.[13] Sputum samples were considered culture-negative if no visible mycobacterial colonies grew on either of the LJ slants within 8 weeks of incubation. *M. tuberculosis* from positive cultures was characterised by colony morphology, and subsequently confirmed by the presence of acid-fast bacilli (AFB) using Ziehl-Neelsen (ZN) staining. The standard proportion method was used for DST of *M. tuberculosis* isolates according to procedures described previously, with isoniazid (INH) 0.2 μg/ml, rifampicin (RMP) 40 μg/ml, ethambutol (EMB) 2 μg/ml and streptomycin (SM) 4 μg/ml.[14] An isolate

Table 1 Geographic distribution of enrolled TB patients. In total, 14 health facilities across seven divisions of Bangladesh participated ($n = 2270$)

Name of hospital	TB patients *n* (%)
Shyamoli Chest Disease Clinic, Dhaka	323 (14.2)
Chan Khar Pul TB Control and Training Institute, Dhaka	273 (12.0)
National Medical College Hospital, Dhaka	103 (4.5)
Community-Based Medical College Hospital, Dhaka	109 (4.8)
Jahurul Islam Medical College Hospital, Vagolpur	111 (4.9)
Comilla Medical College Hospital, Comilla	110 (4.8)
Rajshahi Medical College Hospital, Rajshahi	189 (8.3)
Shaheed Ziaur Rahman Medical College Hospital, Bogra	127 (5.6)
Chittagong Chest Disease Clinic, Chittagong	312 (13.7)
Khulna Medical College Hospital, Khulna	82 (3.6)
Jessore General Hospital, Jessore	89 (3.9)
Sher-e-Bangla Medical College Hospital, Barisal	136 (6.0)
Lutheran Aid to Medicine in Bangladesh Hospital, Dinajpur	141 (6.2)
Jalalabad Ragib-Rabeya Medical College Hospital, Sylhet	165 (7.3)

TB = tuberculosis.

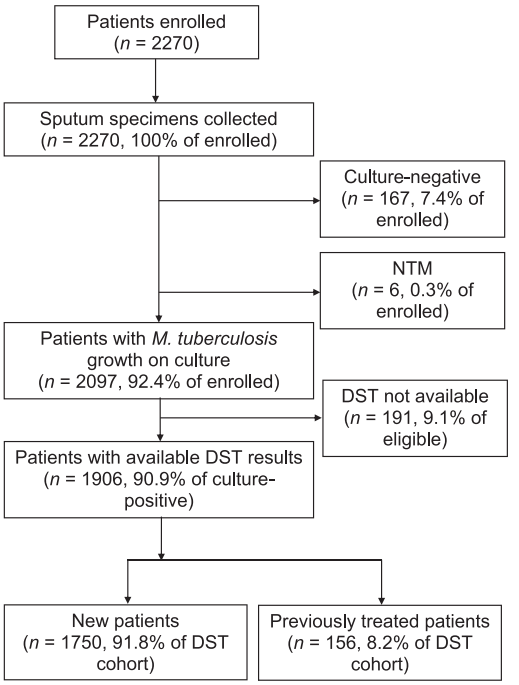

Figure Flow chart of patients with pulmonary TB from the MDR-TB surveillance study and patients included in this analysis. NTM = non-tuberculous mycobacteria; DST = drug susceptibility testing.

was considered resistant to a drug when growth of $\geqslant 1\%$ above control was observed in the drug-containing media. A susceptible strain, H37Rv, and our laboratory-determined resistant strain, SB256 (resistant to SM, INH, RMP and EMB), were used for quality control.

Statistical analysis

Data were entered and analysed using the Statistical Package for Social Sciences (SPSS) version 20.0 (IBM Corp, Armonk, NY, USA). The proportion of drug-resistant TB in different groups was compared using the χ^2 test; $P < 0.05$ was considered statistically significant. Univariate analyses were performed to examine associations between the MDR-TB patients' demographic and clinical variables.

RESULTS

Patient characteristics

A total of 2270 newly registered patients with smear-positive pulmonary TB were enrolled; sputum specimens were collected from all participants. The geographic distribution of enrolled patients is shown in Table 1. Of 173 persons excluded from the analysis, 167 were excluded because their sputum cultures did not show any growth and 6 because isolates from their sputum culture were non-tuberculous mycobacteria (NTM) and not *M. tuberculosis*. Of the 2097 culture-positive patients included in this analysis, DST results were available for 1906 (90.9%) and were included in the final analysis for drug resistance. The proportion of patients previously treated was 8.2% (Figure); 71% were male. The mean age was 38 years (range 8–90) and 65.5% were aged <45 years; 57.7% resided in urban areas (Table 2).

Rates of drug-resistant TB

Among the 1906 patients with DST results, 77.7% (95% confidence interval [CI] 75.8–79.5) had isolates susceptible to all first-line anti-tuberculosis drugs. Resistance to SM was observed in 19.6% (95%CI 17.9–21.4), to INH in 7.6% (95%CI 6.5–8.9), to RMP in 3.9% (95%CI 3.1–4.8), and to EMB in 3.6% (95%CI 2.8–4.5). Monoresistance was as follows: SM 13.4% (95%CI 11.9–14.9), INH 1.0% (95%CI 0.6–1.6), RMP 0.5% (95%CI 0.2–0.8) and EMB 0.4% (95%CI 0.2–0.8). The proportion of MDR-TB was 3.2% (95%CI 2.5–4.1): 2.3% (95%CI 1.7–3.1) in new patients and 13.8% (95%CI 9.2–20.2) in previously treated patients.

The rates of MDR-TB detected annually were as follows: Year 1: 4.2% overall (95%CI 3–5.8) (new 3.1%, previously treated 13.2%); Year 2: 2.5% overall (95%CI 1.4–4.3) (new 2.2%, previously treated 7.4%); Year 3: 2.1% overall (95%CI 1–4.2) (new 1%, previously treated 20.8%); Year 4 (6 months): 3.1% overall (95%CI 1.1–7.3) (new 2%, previously treated 20%). The overall proportion of MDR-TB among the urban population was 3.1% (95%CI 2.3–4.4): 2.5% in new and 9.6% in previously treated patients; among the rural population it was 3.2% (95%CI 2.2–4.7): 2% in new and 22.9% in previously treated patients. Thirty-eight

Table 2 Demographic and clinical characteristics of enrolled TB patients

Characteristics	MDR-TB ($n = 61$) *n* (%)	Non-MDR-TB ($n = 1845$) *n* (%)	Total ($n = 1906$) *n* (%)
Sex			
Male	48 (78.7)	1310 (71.0)	1358 (71.2)
Female	13 (21.3)	535 (29.0)	548 (28.8)
Marital status			
Married	47 (77.0)	1404 (76.1)	1451 (76.1)
Unmarried	14 (23.0)	441 (23.9)	455 (23.9)
Age group, years			
<30	20 (32.8)	778 (42.2)	798 (41.9)
30–44	16 (26.2)	433 (23.5)	449 (23.6)
45–59	12 (19.7)	356 (19.3)	368 (19.3)
⩾60	13 (21.3)	278 (15.1)	291 (15.3)
Place of residence			
Urban	35 (57.4)	1064 (57.7)	1099 (57.7)
Rural	26 (42.6)	781 (42.3)	807 (42.3)
Religion			
Muslim	57 (93.4)	1681 (91.1)	1738 (91.2)
Non-Muslim	04 (6.6)	164 (8.9)	168 (8.8)
Diabetes			
Yes	11 (18.0)	198 (10.7)	209 (11.0)
No	23 (37.7)	655 (35.5)	678 (35.6)
Don't know	27 (44.3)	992 (53.8)	1019 (53.5)
Smoking			
Yes	24 (39.3)	875 (47.4)	899 (47.2)
No	37 (60.7)	970 (52.6)	1007 (52.8)
Alcohol			
Yes	2 (3.3)	106 (5.7)	108 (5.7)
No	59 (96.7)	1739 (94.3)	1798 (94.3)
Drug use			
Yes	1 (1.6)	98 (5.3)	99 (5.2)
No	60 (98.4)	1747 (94.7)	1807 (94.98)
TB patient contact			
Yes	19 (31.1)	557 (30.2)	576 (30.2)
No	42 (68.9)	1288 (69.8)	1330 (69.8)
Previous TB history*			
Yes	21 (34.4)	131 (7.1)	152 (8.0)
No	40 (65.6)	1714 (92.9)	1754 (92.0)
History of incarceration			
Yes	3 (4.9)	193 (10.5)	196 (10.3)
No	58 (95.1)	1652 (89.5)	1710 (89.7)
Duration of cough, months			
<1	7 (11.5)	227 (12.3)	234 (12.3)
1–6	46 (75.4)	1452 (78.7)	1498 (78.6)
7–12	7 (11.5)	144 (7.8)	151(7.9)
⩾12	1 (1.6)	22 (1.2)	23 (1.2)
Duration of fever, months†			
<1	10 (16.4)	305 (16.5)	315 (16.5)
1–6	44 (72.1)	1417 (76.8)	1461 (76.7)
7–12	4 (6.6)	110 (6.0)	114 (6.0)
⩾12	3 (4.9)	13 (0.7)	16 (0.8)

* $P < 0.05$.
† Fisher's exact test, $P < 0.05$.
TB = tuberculosis; MDR-TB = multidrug-resistant TB.

(1.9%) (95%CI 1.5–2.7) patients were resistant to all four first-line anti-tuberculosis drugs (Table 3).

Clinical and socio-demographic characteristics of MDR-TB patients

MDR-TB was significantly higher among patients with a history of previous anti-tuberculosis treatment and those who had fever for ⩾12 months (Table 2). Among MDR-TB patients, 78.7% were male and 59.0% were aged <45 years, which was not statistically significantly different; among other factors, 57.4% of the MDR-TB patients were from urban communities, 18.0% had a history of diabetes, 39.3% were smokers, 3.3% had a history of alcohol consumption, 31.1% had a history of contact with active TB patients within or outside the family and 4.9% had a history of incarceration.

Table 3 Patterns of resistance to first-line anti-tuberculosis drugs among isolates from 1906 patients with pulmonary tuberculosis with available DST results

DST pattern	New patients ($n = 1754$) *n* (%)	Previously treated patients ($n = 152$) *n* (%)	Total ($n = 1906$) *n* (%)
Susceptible to all drugs	1378 (78.6)	103 (67.8)	1481 (77.7)
Any drug resistance			
SM	332 (18.9)	41 (27.0	373 (19.6)
INH	119 (6.8)	26 (17.1)	145 (7.6)
RMP	51 (2.9)	23 (15.1)	74 (3.9)
EMB	51 (2.9)	17 (11.2)	68 (3.6)
Monoresistance			
SM	236 (13.5)	19 (12.5)	255 (13.4)
INH	19 (1.1)	1 (0.6)	20 (1.0)
RMP	7 (0.4)	2 (1.3)	9 (0.5)
EMB	6 (0.3)	1 (0.6)	7 (0.4)
Total	268 (15.3)	23 (15.1)	291 (15.3)
Multidrug resistance			
INH+RMP	3 (0.2)	2 (1.3)	5 (0.3)
INH+RMP+EMB	6 (0.3)	1 (0.6)	7 (0.4)
INH+RMP+SM	6 (0.3)	5 (3.3)	11 (0.6)
INH+RMP+EMB+SM	25 (1.4)	13 (8.6)	38 (2.0)
Total	40 (2.3)	21 (13.8)	61 (3.2)
Polyresistance			
SM+INH	51 (2.9)	3 (2.0)	54 (2.8)
SM+RMP	3 (0.2)	0 (0.0)	3 (0.2)
SM+EMB	4 (0.2)	1 (0.7)	5 (0.3)
INH+EMB	5 (0.3)	1 (0.7)	6 (0.3)
RMP+EMB	0	1 (0.1)	1 (0.1)
SM+INH+EMB	0	4 (0.2)	4 (0.2)
SM+RMP+EMB	0	0	0 (0.0)
Total	63 (3.6)	10 (6.4)	73 (3.8)

DST = drug susceptibility testing; SM = streptomycin; INH = isoniazid; RMP = rifampicin; EMB = ethambutol.

DISCUSSION

This MDR-TB sentinel surveillance study is unique in Bangladesh, reporting drug resistance rates over a period of 3.5 years. Participating sites were randomly selected as nationally representative for the original influenza surveillance, and comprised a mixture of public and private facilities from urban and rural communities; there was at least one participating site from each of Bangladesh's seven divisions. However, the sentinel surveillance sites were selected based on convenience and were not designed to be nationally representative. We acknowledge the limitation of this sentinel surveillance, as the data from this surveillance cannot be extrapolated to the whole TB patient population of Bangladesh.

The prevalence of MDR-TB found in this surveillance study among patients with new and previously treated pulmonary TB (2.3% and 13.8%, respectively) was lower than reported in high MDR-TB burden countries as a whole (on average 4% among new and 22% among retreatment patients).[3] The prevalence found in our survey among new patients was higher than that reported using surveillance data for new patients from WHO's South-East Asia Region (SEAR) countries (2.2%), but for retreatment patients it was lower than that reported (16%) in these countries.[9] The MDR-TB prevalence found in our surveillance for new patients was higher than that found in Bangladesh's 2011 national DRS (1.4%), but for retreatment patients it was much lower (28.5%).[3]

The differences between the national DRS and our surveillance may be due to the difference in study design. In our study, all eligible patients were enrolled when they were registered for the new episode (new and/or previously treated cases) of TB, whereas in the national DRS, 27 new and all retreatment smear-positive patients were enrolled from each cluster. Importantly, retreatment included already registered patients in whom treatment was failing, patients who relapsed immediately following treatment and patients who returned after loss to follow-up. The majority of the previously treated cases enrolled in the national DRS were from chest disease clinics, and thus represented more complicated cases who were failing treatment and were already at risk of developing MDR-TB. This may have contributed to a higher MDR-TB prevalence among retreatment patients in the national DRS. Furthermore, the national DRS may have underestimated MDR-TB in new patients, as almost half of the newly registered MDR-TB cases were excluded from analyses after DNA fingerprinting demonstrated that the isolates from these cases were false-positives.[9]

The proportion of MDR-TB among new patients reflects transmission and incidence, and while it is a smaller number than the proportion among previously treated patients, it often constitutes the largest part of the overall MDR-TB burden. The proportion revealed by this sentinel system is higher than the WHO's current estimates,[3] which suggests that the MDR-TB burden at sentinel sites is considerably higher than the national estimates. The proportions of TB patients with MDR-TB who were detected and reported to the NTP over the last few years were well below those found in the sentinel surveillance system, indicating that a substantial number of MDR-TB patients may be missed by the NTP each year. It is possible that some patients with MDR-TB were appropriately diagnosed but not reported to the NTP (e.g., patients diagnosed and treated in the private sector), but it is likely that many of these patients went undetected. This finding from the sentinel system requires the establishment of a continuous surveillance system involving more sites designed to be nationally representative. If MDR-TB prevalence among new patients in Bangladesh is genuinely higher than reported, it would have important programme implications.

Apart from MDR-TB, our surveillance found that resistance to SM (20%) and INH (8%) were more frequent than resistance to other first-line anti-tuberculosis drugs. These findings correlate with the findings of the first four rounds of the WHO Global Project on anti-tuberculosis drug resistance surveillance and findings from a study in Thailand.[15–18] The high level of SM resistance might be attributable to the widespread use of SM for the treatment of TB and many other non-TB diseases over many decades, beginning in the late 1940s, including standardised WHO Category II treatment. This finding calls into question the usefulness of SM in empiric treatment regimens for retreatment patients or treatment failure patients, which are still used in Bangladesh and other countries.

Acquiring robust data on MDR-TB trends is best accomplished by continuous national MDR-TB surveillance. By the end of 2013, 10 (37%) of the 27 high MDR-TB burden countries in the world had established continuous surveillance systems.[3] Bangladesh ranks tenth among the high MDR-TB burden countries, but seems far from establishing continuous surveillance for MDR-TB. Prospective sentinel surveillance provides a potential counterpoint to intermittent surveys, allowing more accurate estimations. Expanding sentinel surveillance to a broader network of randomly selected clinics that use automated nucleic acid amplification tests for all patients is a feasible option that would allow more robust estimations to be made of the true burden of MDR-TB in Bangladesh. Along with intermittent DRS, such sentinel surveillance would improve estimations and allow a tighter timeline in which to observe trends.

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Conflicts of interest: none declared.

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the US Centers for Disease Control and Prevention.

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RESUME

CONTEXTE : La tuberculose multirésistante (TB-MDR) est un obstacle considérable au succès de la lutte contre la TB. L'enquête de pharmacorésistance à la TB du Bangladesh (DRS) en 2010–2011 a montré que la prévalence de la TB-MDR était dans l'ensemble de 7%, mais de 1,4% chez les patients nouveaux et de 28,5% chez les patients déjà traités. Nous avons tenté de déterminer le taux de TB-MDR dans des sites sentinelles au Bangladesh.

MÉTHODE : Quatorze hôpitaux des sept divisions du Bangladesh ont été sélectionnés comme sites de surveillance sentinelle. Les patients TB nouvellement enregistrés ont été systématiquement enrôlés d'août 2011 à décembre 2014. Les échantillons de crachats ont été traités pour culture et test de pharmacosensibilité aux médicaments antituberculeux par la méthode des proportions sur milieu de Löwenstein-Jensen.

RÉSULTATS : Les échantillons de 1906 (84%) des 2270 patients enrôlés ont été analysés. Des isolats de 61 (3,2%) patients ont été identifiés comme une TB-MDR. La proportion de TB-MDR a été de 2,3% parmi les nouveaux cas et de 13,8% parmi les patients TB déjà traités ($P < 0{,}001$). La proportion d'ensemble de la TB-MDR a été de 3,2% : 3,5% chez les hommes et 2,3% chez les femmes. En termes d'âge, le taux a été le plus élevé (5,2%) chez les $\geqslant 65$ ans.

CONCLUSION : La proportion élevée de TB-MDR parmi les patients nouveaux découverte dans cette enquête diffère sensiblement de celle rapportée dans l'enquête DRS. Bien que les sites de surveillance sentinelle ne sont pas conçus pour être représentatif au niveau national, il est préoccupant d'observer un nombre plus élevé de cas de TB-MDR parmi les nouveaux patients.

RESUMEN

MARCO DE REFERENCIA: La tuberculosis multirresistente (TB-MDR) representa un grave obstáculo al control eficaz de la TB. La Encuesta sobre Tuberculosis Farmacorresistente (DRS) en 2010–2011 en Bangladesh reveló una prevalencia global de TB-MDR de 7%, con 1,4% en los casos nuevos y 28,5% en los pacientes con tratamiento previo. El presente estudio tuvo por objeto determinar la tasa de TB-MDR en centros centinela escogidos en el país.

MÉTODO: Se escogieron como centros de vigilancia centinela 14 hospitales en las siete divisiones de Bangladesh. Se incluyeron sistemáticamente en el estudio todos los pacientes con TB registrados de agosto del 2011 a diciembre del 2014. En las muestras de esputo recogidas, se practicó el cultivo y las pruebas de sensibilidad a los medicamentos antituberculosos mediante el método de las proporciones en medio Löwenstein-Jensen.

RESULTADOS: Se analizaron las muestras de 1906 pacientes de los 2270 incluidos (84%). Sesenta y un aislados clínicos se definieron como TB-MDR (3,2%). La proporción de TB-MDR fue 2,3% en los casos nuevos y 13,8% en los pacientes con antecedente de tratamiento antituberculoso ($P < 0{,}001$). La proporción global de TB-MDR fue 3,2%, a saber, 3,5% en los hombres y 2,3% en las mujeres. La tasa más alta de TB-MDR en función de la edad (5,2%) se observó en el grupo a partir de los 65 años.

CONCLUSIÓN: La alta proporción de TB-MDR en los casos nuevos que se observó en el presente estudio difiere significativamente de lo reportado en la DRS. Mientras que los centros de encuesta centinela no fueron diseñados para ser representativa a nivel nacional, es preocupante observar un mayor número de casos de TB-MDR entre los nuevos pacientes.