Assessment for Enrollment Rate of Multidrug-Resistant Tuberculosis (MDR-TB) Cases in 2017 in Kano State, North West Nigeria

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Abstract

Background: Multi-drug resistant tuberculosis (MDR-TB) is one of the greatest challenges to controlling tuberculosis worldwide, Nigeria inclusive. We conducted a descriptive, cross-sectional study to identify and access the enrollment rate of MDR-TB cases in 2017 in Kano state, north west Nigeria

Methods: We reviewed the MDR-TB patients line list of Kano state tuberculosis and leprosy control program (TBLCP) using the National TBLCP line listing template. The data was analyzed using Epi Info version 3.5.4 and Microsoft Excel 2007.

Results: A total of 121 MDR TB cases were managed in the year 2017 in Kano state, of which 115 (95.0%) were identified within the year, 5 (4,1%) were referred in from other states, 1 (0.9%) carried over to the year. Of the 121 cases managed, 82 (67.8%) were males. Of the 121 cases managed in the year 2017, 77 (63.6%) were enrolled, 3 (2.5%) died before enrolment, 5 (4.1%) refused treatment and 14 (11.6%) loss to follow up. The highest number of MDR cases managed, 38 (31.4%) was in Q3 while Q1 had the lowest number of cases managed as 20 (16.5%). Q3 had the highest enrollment rate of 89.5% (34/38) while Q4 had the lowest enrollment rate of 17.9% (5/28).

Conclusions: The MDR TB enrollment rate in Kano state in 2017 is low. Majority of the cases were enrolled in Q3 of the year. There is high rate of loss to follow up. There is need for Kano TBLCP to institute prompt identification of cases for immediate enrollment.

Keywords: Assessment, enrollment rate, Multidrug-resistant tuberculosis, Kano state, north west Nigeria.

Introduction

Tuberculosis (TB) remains a major global public health problem. It causes illness among millions of people each year and is ranked as the second leading cause of death from an infectious disease worldwide [1]. Globally around 8.6 million new TB cases in 2012 were reported and 1.3 million die every year as a result of TB [1]. Ethiopia, having experienced a major increase in the burden of TB, presents one of the most serious public health challenges. Ethiopia is highly afflicted by the TB pandemic and is ranked second after Nigeria in Africa and seventh among the 22 high TB burden countries worldwide [2-3]. Multidrug-resistant (MDR) TB has become a major public health problem and presents new barriers to the control of TB. Drug-resistant TB is a man-made problem, largely being the consequence of human error as a result of poor supply management and quality of anti-TB drugs and inadequate or improper treatment, which is further exacerbated by human immunodeficiency virus (HIV) [1]. Poor infection control practice has also been identified as a major contributing factor for the spread of drug-resistant TB. Nearly half a million cases of MDR-TB emerge every year, but only 3% of them get treatment globally and 110,000 die annually [4]. The World Health Organization's Global MDR-TB report estimated that there were 440,000 MDR-TB cases [3.6% (95% CI: 3.0-4.4)] and 150,000 deaths due to MDRTB worldwide in 2008. China and India accounted more than half of the MDR-TB worldwide [1]. According to a WHO/IUATLD (World Health Organization/International Union Against Tuberculosis and Lung Disease) survey of 20 countries with the

highest rates of MDR-TB among previously treated cases, 14 were in the European Region [5]. In Africa 69,000 MDR-TB cases were reported in 2008 [1].

Drug resistant TB compounds the risk posed to public health, because without successful completion of treatment and achievement of cure, a patient with TB can become a source that transmits the infection with a more virulent strain to others [6]. *In vitro* resistance to anti-TB drugs was first reported in Nigeria over three decades ago [7] and local health practitioners have the perception that drug resistance has increased in the recent years. MDR TB (resistance to at least Rifampicin and Isoniazid) accounts for 1–3% of the global TB burden but is responsible for 2.9–14% of TB cases in Nigeria [8]. A weak TB control programme implementation may have contributed to the emergence of MDR TB. The WHO estimates that the proportion of patients with MDR/RR-TB is 4.3% among new cases and 25% among previously-treated cases in Nigeria [9]. It is important to access the enrollment rate.

Methods

Study area

The study was conducted in Kano, the capital city of Kano State, north west Nigeria.[10]. Kano is very cosmopolitan and is reported to be the second most populous state in Nigeria after Lagos state with a total population of 12.6 million. The state is made up of 44 local government areas (LGAs), the highest in Nigeria. Each of the LGAs is made up one tuberculosis leprosy supervisor (TBLS). Kano state has 18 Cepheid Xpert MTB/RIF (*gene* Xpert) sites with one centralized DR TB treatment center located at the state infectious disease hospital (IDH). The Nigerian north west zonal TB reference laboratory is also located at Kano state.

Study design

This is a cross-sectional descriptive study that included the use of secondary data of Kano state DR TB component of the state tuberculosis and leprosy control programme (STBLCP).

Study population

The study population was all MDR TB patients identified in Kano state, north west Nigeria. Nigeria.

Inclusion criteria

• All MDR-TB patients identified by the Kano STBLCP.

Exclusion criteria

Those that did not test positive for RIF resistance or MDR TB positive on g*ene* Xpert.

Sample size determination

A data of 121 MDR TB cases was analysed.

Study instruments

We used the National Tuberculosis and Leprosy Control program (NTBLCP) line listing report for rifampicin (RIF) resistant TB cases forms, quarterly reporting form for presumptive and confirmed TB form, RIF resistant cases managed by the state in the previous year, RIF resistant cases managed by state in the quarter under review, line listing of each RIF resistant cases enrolled on 2nd line DR TB treatment in the community, line listing of each RIF resistant cases referred to the treatment center enrollment on 2nd line DR TB treatment forms.

Data management

We reviewed the data of Kano state MDR TB which is a component of the state tuberculosis and leprosy control programme (STBLCP) data. The data was analyzed using Epi Info version 3.5.4 (US Centers for Disease Control and Prevention) and Microsoft Excel 2007.

Ethical considerations

Ethical clearance was obtained from the ethical review board, ministry of health, Kano state. Respect to participants' rights was observed including the right to refuse participation with explanation through participant's information form and provision of individual consent forms for the consent of the participants.

Limitations

This was a secondary analysis. A few of the data were missing. However, that was not significant to impact on the data. This study mainly focused on the process of tracing patients from MDR-TB detection to enrollment in treatment. Detection rates and treatment success rates were not assessed. Thus, these data may not reflect the overall effects of MDR-TB control.

Results

A total of 121 MDR TB cases were managed in the year 2017 in Kano state, of which 115 (95.0%) were cases identified within the year, 5 (4,1%) were referred in from other states within the year, 1 (0.9%) carried over to the year. In the year 2017, no (0) MDR TB was transferred to another state. Of the 121 cases managed, 82 (67.8%) were males of the 121 cases managed in the year 2017, 77 were enrolled giving an enrolment rate of 63.6%, 3 died before enrolment giving a death rate of 2.5%, 5 refused treatment giving a refusal rate of 4.1% and 14 could not be tracked giving a loss to follow up of 11.6% (Table 1).

Sex distribution of the MDR TB cases showed male preponderance from Q1 to Q4. The highest male dominance was at Q3 where males accounted for 33 (86.8%) of the 38 MDR TB cases in the quarter. The least male dominance was in Q2 were males accounted for 20 (57.1%) of the 35 MDR TB cases (Fig 1)

Distribution of the MDR TB cases by quarter showed Q3 had the highest number of MDR cases managed as 38 (31.4%) while Q1 had the lowest number of cases managed as 20 (16.5%) (Fig 2). The trend of enrollment rate by quarter showed Q3 had the highest enrollment rate of 89.5% (34/38) while Q1 had the lowest enrollment rate of 17.9% (5/28) (Fig 3).

Discussion

Our study found the MDR TB enrollment rate in Kano state in 2017 to be 63.6%. This is low as every identified MDR TB case is supposed to be enrolled for management. MDR-TB is characterized by long treatment duration, a high cost of treatment, low cure rates and high mortality rates and is an important infectious source. The level of MDR-TB transmission is directly correlated with the prevalence of primary MDR-TB. Early detection and timely and appropriate treatment are vital to the control of MDR-TB [11]. The MDR TB enrollment rate in this study is lower than the average global rate of 90% but higher than the rate found in a study in Human Province of China which had enrolment rate of 61.8% and the overall rate of 49% in China [12]. Thus, enrollment in treatment should be prioritized to address the rate of untreated cases as well as the challenges associated with MDR-TB. In line with a 2009 World Health Assembly (WHA) Resolution, the Global TB Programme of WHO monitors the efforts made by countries to expand universal access to MDR-TB care and prevention. The emergence of MDR-TB remained a major public health threat particularly in developing countries. With increased prevalence and complexity of treatment, the burden of MDR-TB challenged the country. Several factors can account for low enrollment rate. This include death of cases before enrollment, enrollment refusals, cases that cannot be tracked. Other factors include advancement in age, poor treatment affordability or inability or reluctance to see a doctor; some elderly people have lack of confidence to enroll in treatment if they believe that they might not survive for more than a few years regardless of treatment [13]. Rural patients and unemployed patients may be more impoverished and have a higher likelihood of being unable to afford MDR-TB care. Many of the MDR TB cases may be from rural certain or low-income families. Another possible factor is the concerns about work and studies: The full duration of MDR-TB treatment is typically approximately 24 months, and patients need to be hospitalized during the first 1–2 months of treatment [14].

We found a death rate of 2.5%, enrollment refusal rate of 4.1% and 11.6% loss to follow up. This underscores the dare need to intensify MDR TB cases tracking, enrollment and monitoring. As any little mishap can lead to missing them out. Also, the disease has high morbidity and mortality. Drug resistant TB compounds the risk posed to public health, because without successful completion of treatment and achievement of cure, a patient with TB can become a source that transmits the infection with a more virulent strain to others (Abuja et al, 2012). The DOT strategy has been used as an effective means to address adherence problems. The development of effective treatment strategies such as DOT has shifted the focus of TB management from the prevention of mortality to the avoidance of morbidity [15].

Our study found male preponderance among the MDR TB cases. This reflected all through from Q1 to Q4 2017. Male MDR TB preponderance was also reported from other previous studies in Nigeria [16-17]. Cultural practices and occupation that predisposes men may be responsible.

Our study is limited such that the findings may not reflect the overall effects of MDR-TB control study mainly focused on the process of tracing patients from MDR-TB detection to enrollment in treatment. Detection rates and treatment success rates were not assessed.

Conclusions

We conclude that the MDR TB enrollment rate in Kano state is low. Major factors are death before enrollment, refusal for enrollment and those that cannot be traced. There is need for the MDR TB control programme to institute prompt identification of cases for immediate enrollment and intensify MDR TB awareness on the need for cases to keep to the enrollment protocols.

Acknowledgements

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Tables and figures

Table 1. Showing total number of MDR TB cases managed in the year, number of, number of enrollments, number of deaths before enrollment, number that refused enrollment and number of those that could not be traced for enrollment /loss for follow up in Kano state Q1-Q4 2017

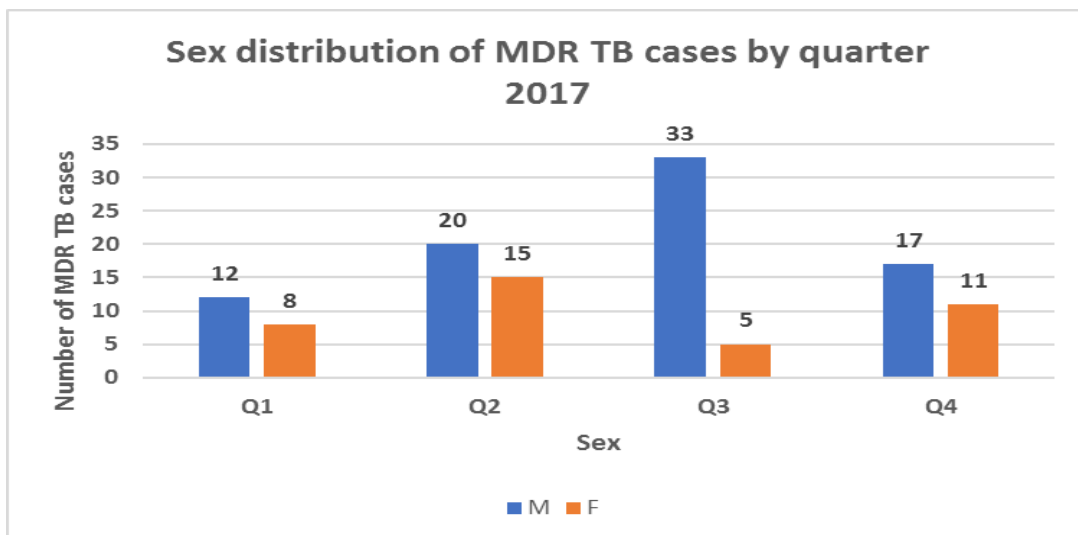| Quarter	Total number of cases managed in the year	Number of enrollments	Number of deaths before enrollment	Number that refused enrollment	Number of those that cannot be traced for enrollment /loss for follow up
Q1	20	14 (70.0%)	2 (10.0%)	2 (10.0%)	2 (10.0%)
Q2	35	24 (68.6%)	0 (0.0%)	2 (10.0%)	11 (31.4%)
Q3	38	34 (89.5%)	0 (0.0%)	1 (3.6%)	1 (3.6%)
Q4	28	5 (17.9%)	1 (3.6%)	0 (0.0%)	2 (7.1%)
Total	**121**	**77 (66.6%)**	**3 (2.5%)**	**5 (4.1%)**	**14 (11.6%)**

Figure 1. Showing sex distribution of MDR TB cases Q1 – Q4 in Kano state, north west Nigeria 2017
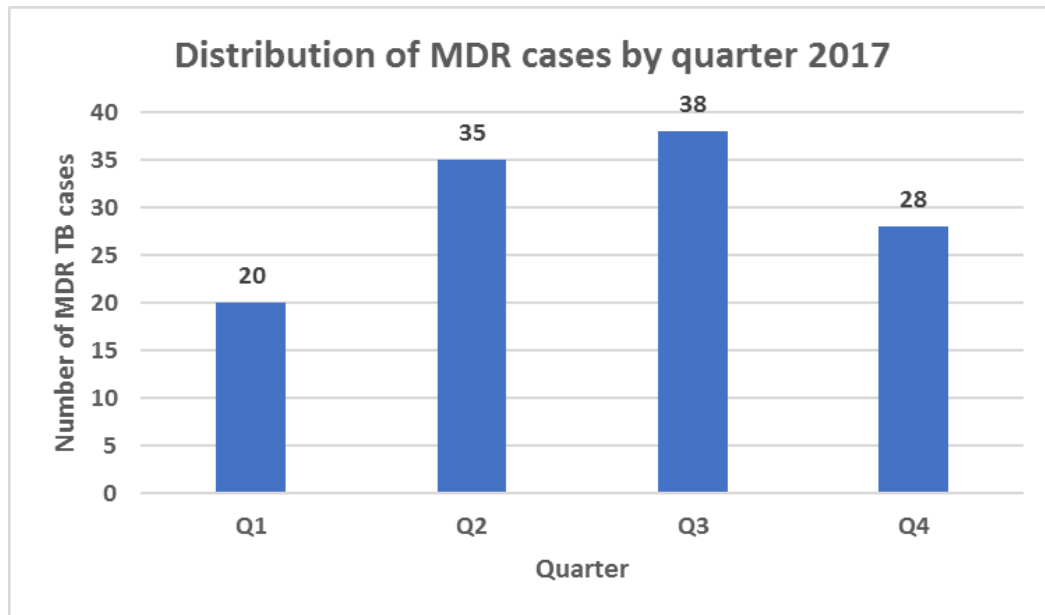
Figure 2. Showing quarterly distribution of MDR TB cases Q1 – Q4 in Kano state, north west Nigeria 2017
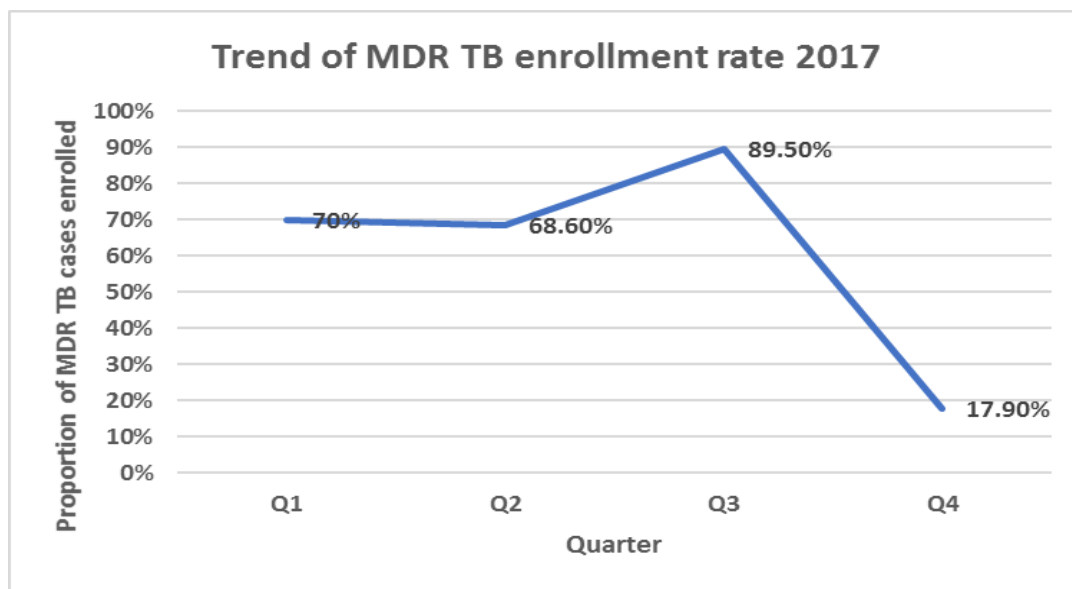

Figure 3. Showing trend of MDR TB enrollment rate Q1 – Q4 in Kano state, north west Nigeria 2017