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Original Research Article

Outcome of anti-tubercular therapy on rifampicin sensitive non-HIV patients with tubercular cervical lymphadenopathy in Bangladesh

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ABSTRACT

Background: Tuberculosis (TB) remains a significant public health concern, particularly in developing countries like Bangladesh. The study aims to evaluate the outcomes of a six-month anti-tubercular therapy in rifampicin (RIF)-sensitive, non-HIV patients with tubercular cervical lymphadenopathy (TCL), and to challenge the conventional wisdom of extended treatment durations.
Methods: This retrospective observational study was conducted at Dhaka medical college, Dhaka, Bangladesh, from July 2019 to July 2023. A total of 189 patients diagnosed with TCL were included, adhering to specific inclusion and exclusion criteria. Various socio-demographic characteristics, clinical presentations, and treatment outcomes were analyzed.
Results: The majority of the participants were aged 15-30 (71.43%) and were female (68.25%). Fever was the most common clinical presentation, affecting 66.67% of the participants. After six months of therapy, 33.86% showed a complete response, and various clinical presentations were observed, with neck pain being the most common (11.64%). Among the 64 with complete response after 6 months, only 7.81% showed relapse at follow-up.
Conclusions: Our study suggests that a six-month treatment regimen can yield significant responses in TB patients. It challenges the prevailing notion that extended treatment durations are universally necessary. Treatment plans should be individualized, taking into account the clinical conditions of each patient, and should be advised by a clinician or a respected doctor.

Keywords: TB, RIF, Sensitive, Resistant, Multidrug resistant

INTRODUCTION

Tuberculosis (TB) remains a persistent global health crisis, affecting millions of people each year. According to the world health organization (WHO), approximately 10 million people fell ill with TB in 2019, making it the leading cause of death from a single infectious agent, surpassing even HIV/AIDS.[1] The global burden of TB is not uniformly distributed; it disproportionately affects low- and middle-income countries, including Bangladesh at a higher percentage.[2] In Bangladesh, the situation is particularly alarming. The country faces unique challenges such as high population density and limited healthcare infrastructure, which exacerbate the TB problem.[3] A study conducted in an urban slum of Dhaka city revealed a high prevalence of TB, estimated at 253 per 100,000 among adults.[4] Risk factors for TB are multifaceted and include low socioeconomic status, malnutrition, and co-infections such as HIV.[5] In a high-incidence area of Lima, Peru, factors like illegal drug use,

multidrug-resistant TB, and lack of HIV testing were associated with premature termination of treatment.[6] Similarly, a study in Portugal found that TB/HIV co-infection, age over 64 years, and IV drug abuse were predictors of unsuccessful treatment.[7] Treatment for TB generally involves a regimen of multiple antibiotics, including RIF. RIF is particularly crucial for treating TB strains that are especially sensitive to RIF. However, the emergence of drug-resistant strains, including multidrug-resistant TB (MDR-TB), poses a significant challenge to TB control efforts globally.[8] In Bangladesh, one study found a multidrug-resistant case in an urban slum, highlighting the need for vigilant monitoring and treatment.[4] The importance of RIF in the treatment of TB cannot be overstated. RIF-sensitive strains respond well to treatment regimens that include this antibiotic, making it a cornerstone of TB management.[9,10] However, adherence to treatment remains a significant barrier to TB control. Factors influencing patient adherence to TB treatment are complex and include economic, social, and health system factors.[11] The present study aims to investigate the outcome of 6 months of anti-tubercular therapy in RIF-sensitive non-HIV patients in Bangladesh. The study is crucial for several reasons. First, it will provide valuable data on effectiveness of RIF-sensitive TB treatment in a Bangladeshi context. Second, it will contribute to the limited body of research focusing on TB in Bangladesh, particularly among non-HIV patients. Lastly, the findings could inform public health strategies and interventions aimed at improving TB control in Bangladesh and similar settings.

METHODS

This retrospective observational study was conducted at the department of ENT and head neck surgery, Dhaka medical college, Dhaka, Bangladesh, over a span of four years from July 2019 to July 2023. The initial sample size comprised 189 patients diagnosed with TCL during the study period. All participants were over the age of 15 and had started the standard anti-TB therapy. Inclusion criteria were based on clinical examination, laboratory investigations, and histopathological confirmation of TCL. Patients with a history of anti-tuberculous treatment, those diagnosed with other forms of TB or any other concurrent chronic or infectious diseases, and children with TB were excluded. Additionally, patients showing resistant TB strains were omitted. The study also excluded participants who were unable to provide informed consent or were lost to follow-up. Clinical presentations were recorded after 6 months of therapy, and follow-up findings were noted among complete response cases after 6 months from the treatment end date. Data were analyzed using descriptive statistics to summarize clinical presentations and follow-up findings.

RESULTS

Table 1 displays the distribution of participants (n=189) in terms of their socio-demographic characteristics. In terms of age, the majority of participants, accounting for 71.43%, fell within the 15-30 age range. A significant proportion (21.16%) belonged to the 31-45 age group, while 7.41%, were above the age of 45. In terms of gender, females constituted the larger share with 68.25%, while males accounted for 31.75% of the participants. In terms of residence, 69.84% of the participants were from urban areas, whereas 30.16% resided in rural areas. Analyzing the occupation of the participants, the largest group consisted of students, representing 37.04% of the sample. Housewives accounted for 33.86% of the study population. Service workers comprised 12.17% of the participants, while businessmen represented 7.41%. The remaining 9.52% of the participants belonged to other occupation categories. Among the participants, 35.98% were classified as belonging to lower class, while majority (61.38%) fell into the middle-class category. A smaller proportion of participants, 2.65%, were classified as upper class.

Table 1: Distribution of participants by socio-demographic characteristics, (n=189).

Characteristics	N	Percentage (%)
Age (in years)		
15-30	135	71.43
31-45	40	21.16
>45	14	7.41
Gender		
Male	60	31.75
Female	129	68.25
Residence		
Urban	132	69.84
Rural	57	30.16
Occupation		
Student	70	37.04
Housewife	64	33.86
Service worker	23	12.17
Businessman	14	7.41
Others	18	9.52
Socioeconomic status		
Lower class	68	35.98
Middle class	116	61.38
Upper class	5	2.65

Table 2 presents the distribution of participants based on their clinical presentations. The most prevalent clinical presentation among the participants was fever, accounting for 66.67% of the cases. Abscess was another commonly reported clinical presentation, with 49.21% of the participants experiencing it. Cough was observed in 30.16% of cases, while a smaller proportion reported loss of weight (3.70%) and night sweat (2.65%) as clinical presentations.

Weakness was reported by 2.12% of participants. Additionally, 12.17% (n=23) of participants reported having comorbidities such as diabetes mellitus (DM), hypertension (HTN), asthma, among others.

Table 2: Distribution of participants by clinical presentations, (n=189).

Clinical presentations	N	Percentage (%)
Fever	126	66.67
Abscess	93	49.21
Cough	57	30.16
Loss of weight	7	3.70
Night sweat	5	2.65
Weakness	4	2.12
Comorbidities (DM, HTN, asthma etc.)	23	12.17

Table 3 displays the distribution of participants based on the duration of TB presentation. Among the participants, only 5.82% had a TB presentation lasting less than 2 weeks. A larger proportion, 32.80% (n=62), reported a duration of TB presentation ranging from 2 weeks to 1 month. The majority of participants, accounting for 61.38% had a TB presentation lasting more than one month.

Table 3: Distribution of participants by duration of TB presentation, (n=189).

Duration of TB presentation	N	Percentage (%)
<2 weeks	11	5.82
2 weeks to 1 month	62	32.80
>1 month	116	61.38

Table 4 presents the distribution of participants based on neck swelling-related characteristics. The participants' neck swelling type was categorized into three groups: bilateral, unilateral on the right side, and unilateral on the left side. Among the participants, 23.28% exhibited bilateral neck swelling, while 41.27% had unilateral swelling on the right side, and 35.45% had unilateral swelling on the left side. Approximately 51.32% of the participants had a swelling size of 3 cm or smaller, while 48.68% had a swelling size larger than 3 cm. The presence of tenderness in the neck swelling was also recorded.

A majority of the participants (70.90%) reported tenderness, while 29.10% did not experience tenderness. Among the participants, 37.57% had swelling in single level node, while 62.43% had swelling in multiple level of nodes.

Due to this, node level distribution of the participants was as follows: node level I accounted for 5.29% (n=10) of the participants, node level II comprised 46.56% (n=88), node level III encompassed 38.62% (n=73), Node Level IV represented 42.33% (n=80), node level V constituted 58.73% (n=111), and node level VI encompassed 6.88% (n=13) of the participants.

Table 4: Distribution of participants by neck swelling related characteristics, (n=189).

Characteristics	N	Percentage (%)
Swelling type		
Bilateral	44	23.28
Unilateral (Right side)	78	41.27
Unilateral (Left side)	67	35.45
Swelling size (cm)		
≤3	97	51.32
>3	92	48.68
Presence of tenderness		
Yes	134	70.90
No	55	29.10
Swollen node		
Single level node	71	37.57
Multiple level nodes	118	62.43
Node level		
Node level I	10	5.29
Node level II	88	46.56
Node level III	73	38.62
Node level IV	80	42.33
Node level V	111	58.73
Node level VI	13	6.88

Table 5: Distribution of treatment response among participants by neck swelling size after 6 months of therapy, (n=189).

Swelling size	N	Percentage (%)
≤10 mm	64	33.86
11 mm-3 cm	113	59.79
>3 cm	12	6.35

A tumor size of 10 mm or less was recognized as having complete response to standard therapy, which was the case for 33.86% of the cases. 59.79% of the cases had tumor size between 16 mm-3 cm, and were referred for an extended duration of treatment. 6.35% (n=12) had tumor size >3 cm despite 6 months of standard treatment and were suggested surgery.

Table 6: Clinical presentations among participants after 6 months of therapy, (n=189).

Clinical presentation	N	Percentage (%)
Hepatitis	2	1.06
Diminished vision	3	1.59
Loss of body weight	4	2.12
Oral thrush	6	3.17
Loss of the appetite	7	3.70
Joint pain	9	4.76
Fever	10	5.29
Sinus	11	5.82
New abscess	12	6.35
Neck pain	22	11.64

After 6 months of therapy among the 189 participants, various clinical presentations were observed. Hepatitis was the least common, affecting only 2 participants, which accounts for 1.06% of the sample. Diminished vision was reported by 3 participants, making up 1.59% of the cases. Loss of body weight was observed in 4 participants, constituting 2.12% of the sample. Oral thrush was more frequent, affecting 6 participants or 3.17% of the sample. Loss of appetite was reported by 7 participants, representing 3.70% of the cases. Joint pain was experienced by 9 participants, accounting for 4.76% of the sample. Fever was reported by 10 participants, making up 5.29% of the cases. Sinus issues were observed in 11 participants, constituting 5.82% of the sample. New abscesses were reported by 12 participants, or 6.35% of the sample. The most common clinical presentation was neck pain, affecting 22 participants, which accounts for 11.64% of the sample.

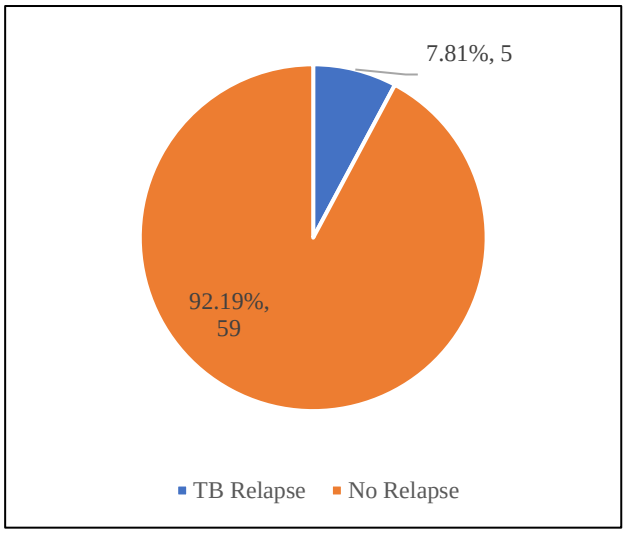

Figure 1: Follow-up findings among complete response cases after 6 month of treatment end date, (n=64).

In Figure 1, the follow-up findings among the 64 participants who showed a complete response after 6 months of treatment are presented. The data indicates that TB relapse occurred in 5 participants, accounting for 7.81% of this subgroup. Conversely, the majority of participants, numbering 59, did not experience a relapse, making up a significant 92.19% of the cases.

DISCUSSION

In the present study, we investigated the outcomes of a 6-month anti-tubercular therapy regimen in RIF-sensitive, non-HIV patients in Bangladesh. Our findings offer a nuanced understanding of the socio-demographic characteristics, clinical presentations, and treatment outcomes among the study participants. Our study revealed that the majority of the participants were young adults between the ages of 15-30, accounting for 71.43%. This demographic distribution aligns with a study conducted in Penang, Malaysia, which also reported a higher prevalence of TB among younger age groups.[12] This finding also aligns with findings from a recent study in Bangladesh that also reported a higher prevalence of TB among younger age groups.[13] However, our study found a higher percentage of females (68.25%) compared to males, which contrasts with another study that reported a higher incidence of TB among males.[14] Clinical presentations such as fever (66.67%), abscess (49.21%), and cough (30.16%) were the most common among our participants. These symptoms are consistent with findings from multiple studies.[15,16] However, a study in Nigeria reported that knowledge about TB was a significant factor affecting treatment adherence and outcomes, implying that clinical presentations alone may not be sufficient indicators of treatment success.[17] In terms of treatment duration, most participants had a TB presentation lasting more than one month (61.38%). This finding is corroborated by a study by Chen et al which emphasized the importance of early diagnosis and treatment to prevent prolonged disease presentation.[18] However, a study in Belarus found discrepancies in treatment outcomes for patients with drug-resistant TB, suggesting that the duration of TB presentation could vary based on drug susceptibility.[19] Our study found that a significant proportion of participants showed a complete response to standard therapy after 6 months, with 33.86% having a tumor size of ≤10 mm. This challenges the conventional wisdom of longer treatment durations. This is supported by a study that explored the possibility of shortening TB treatment to 4 months without compromising efficacy.[20] However, a study in Botswana suggested that diagnostic algorithms without non-tuberculous mycobacteria could lead to sub-optimal treatment, implying that a 6-month treatment regimen may not be universally applicable.[21] After 6 months of therapy, various clinical presentations were observed. The most common was neck pain, affecting 11.64% of the sample. This is higher than what is generally reported in the literature, suggesting that our sample may have more severe forms of the disease.[22] Among the 64 participants who showed a complete response, only 7.81% experienced a TB relapse, reinforcing the efficacy of a 6-month treatment regimen. This finding is in line with a study that reported a higher death rate in COVID-19/TB co-infection, emphasizing the importance of effective TB treatment to prevent complications.[23] Importantly, our findings underscore the need for individualized treatment plans for TB patients. A study published in 2022 emphasized the high effectiveness of an individualized approach to the treatment of TB, including the need for an individualized regimen of anti-TB therapy.[24] Another study also highlighted the importance of individualized treatment duration in TB treatment.[25] Therefore, taking medicine for six months can result in a response, and it doesn't necessarily mean taking medicine for one or two years. Treatment plans for TB must be individualized, taking into account the clinical conditions of each patient, and should be advised by a clinician or a respected doctor.

Limitations

Study is limited by its single-center design at Dhaka medical college, which may not be representative of broader population in Bangladesh. Additionally, the sample size of 189 patients may not provide sufficient power to detect less common clinical presentations/outcomes. Lastly, the retrospective design of the also presents as a limitation.

CONCLUSION

In conclusion, our study underscores the importance of individualized treatment plans in managing TB. We found that a six-month regimen can yield significant responses, challenging the prevailing notion that extend treatment durations are universally necessary. Our findings suggest that it is not appropriate to recommend a one-and-a-half-year treatment course for all patients. Instead, treatment plans should be tailored to specific clinical conditions of each patient and should be guided by qualified clinicians or respected doctors. This individualized approach not only has potential to improve patient outcomes but also to optimize resource allocation in TB management.

Recommendations

Based on the findings of our study, we recommend that healthcare providers consider individualized treatment durations for TB patients, rather than adhering to a one-size-fits-all approach. Further research is needed to validate the efficacy of a six-month treatment regimen across diverse patient populations. Clinicians should also be trained to recognize various clinical presentations of TB to ensure timely and appropriate treatment.

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