ORIGINAL ARTICLE

DRUG RESISTANCE PATTERNS AND TREATMENT REGIMENS IN DRUG-RESISTANT TUBERCULOSIS: A STUDY FROM KATHMANDU, NEPAL

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ABSTRACT

Introduction: Multi drug resistance is a serious threat for high prevalence countries and may have some effect on low prevalence countries and it is defined as resistance to at least isoniazid and rifampicin. Drug resistance tuberculosis results from in sufficient chemotherapy and other many factors. DR-TB treatment regimen is longer which use second line medication with high toxicity

Method: A retrospective study in GENETUP, NATA was conducted and patient's data were taken for past 2 years from mangsir 2076 to mangsir 2078. Purposive sampling was done for the study. SPSS 16 and Microsoft excel 19 were used for the analysis of our result obtained in our study.

Results: Of total 374 TB cases, 109 DR-TB patients were enrolled, out of which 76 were male and 33 were female. Majority of patients i.e., 43 were in between the weight group 46-55 kg. High number of patients i.e., 47(43.1%) were in the middle-aged adult group (31-59). 7 patients were found to have HIV status positive and 7 were found to be diabetics. 50 patients were categorized as new and 59 were categorized as previously treated patients. 77 patients were MDR/RR TB, 30 were pre-XDR and 2 were XDR TB. 56 patients were prescribed LR1 regimen, 31 were prescribed LR2 and 22 were prescribed SSTR regimen. 92(84.4%) patients were successfully treated which included cured and completed case. 10.1 % patients died and 5.5% patients lost to follow up.

Conclusion: In our study, majority of DR-TB patients were male and high number of patients i.e., 47(43.1%) were in the middle-aged group (31-59) The most common pattern observed was MDR/RR TB and maximum patient were prescribed LR1 treatment regimen.

Key words: ***Drug-resistance tuberculosis, Multi drug resistance, Extensive drug resistance, Treatment regimen, treatment outcome***

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INTRODUCTION

Multidrug-resistance tuberculosis (MDR TB) is defined as tuberculosis showing resistance to at least isoniazid and rifampicin and rise of this TB is a serious threat to tuberculosis control.[1] Drug-resistant tuberculosis frequently results from insufficient chemotherapy. DR-TB must be treated with prolonged, expensive chemotherapy using second-line medications with higher toxicity.[2] The spread of bacteria which is resistant to antibiotics poses a serious risk to morbidity and mortality on a global scale.[3] 90% of rifampicin (RIF) resistance strains also exhibit isoniazid (INH) resistance, which is a potential sign of multi-drug resistance (MDR).[4] The main obstacles to treatment adherence which may leads to drug resistance include lack of knowledge about the cause, transmission, and duration of the treatment, drug side effects, and stopping the treatment altogether which leads to relapse and death.[5] The cornerstone of MDR-TB treatment is fluoroquinolones for MDR-TB patients.[6] The number of incident RR/MDR TB cases in 2017 was estimated at 5,58,000. Globally 1,60,684 cases of MDR/RR were detected and notified in 2017.[7] Rifampicin-resistant tuberculosis (RR TB) was diagnosed in 71% of patients in 2020 according to the Global TB Report 2021.[8] The proportion of new cases with multidrug-resistant TB(MDR-TB) was 2.2% among new cases and 15.4% among retreatment cases based on DRS survey carried out in 2011/12. An XDR survey conducted by GENETUP in 2012 showed that among MDR-TB patients, 28% had pre-XDR TB and 8% had XDR TB.[7] According to the most recent WHO tuberculosis report (2018) the total number of new(incident) TB cases worldwide in 2017 was estimated at 10 million. Among these 9% were HIV+ worldwide in 2017, 6.4 million new cases of MDR/RR TB cases were detected notified to national authorities and then reported to WHO.[9] According to national tuberculosis program Nepal (NTP), 392 MDR /RR-TB cases were enrolled (out of 635 notified) during FY 2075/76; 0.6% among new TB cases and 20% among the previously treated case (compared to 3.4% of new TB and 18% of previously treated cases globally). People with bacteriologically confirmed TB were tested for rifampicin resistance, up from 57% in 2074/75 to 78% in 2075/76.[9] In 2016/17, a total of 257 RR/MDR, 91 pre-XDR TB and 18 were XDR-TB were enrolled for the treatment. Treatment success rate (TSR) of RR/MDR patients was 71 %. However, the TSR of pre-XDR is 61 %, which is marginally lower than RR/MDR TB cases.[9] Purpose of our study was to know the pattern of drug resistance tuberculosis, to study drug treatment regimen and successful treatment outcome.

METHODS

This retrospective study was conducted at NATA (GENETUP) in Kalimati, Kathmandu, focusing on patients diagnosed with drug-resistant tuberculosis. A total of 109 patients were selected using a purposive sampling technique. Data were collected from Mangshir 2076 to Mangshir 2078 and analyzed using the Statistical Package for Social Sciences (SPSS) version 16 and Microsoft Excel 2019. The study included only patients diagnosed with drug-resistant tuberculosis, while those diagnosed with drug-susceptible tuberculosis were excluded.

RESULT AND DISCUSSION

The figure 1 shows that A total of 109 DR-TB patients were enrolled. Among them majority of patients 76 (69.7%) were male. The study conducted by Bharati A, et.al on Treatment outcome of drug-resistant tuberculosis (DR-TB) following uptake of universal drug susceptibility testing showed that a total of 201 DR-TB patients, (62.2%) were male.[10]

How to Cite

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Demographic characteristics of study population

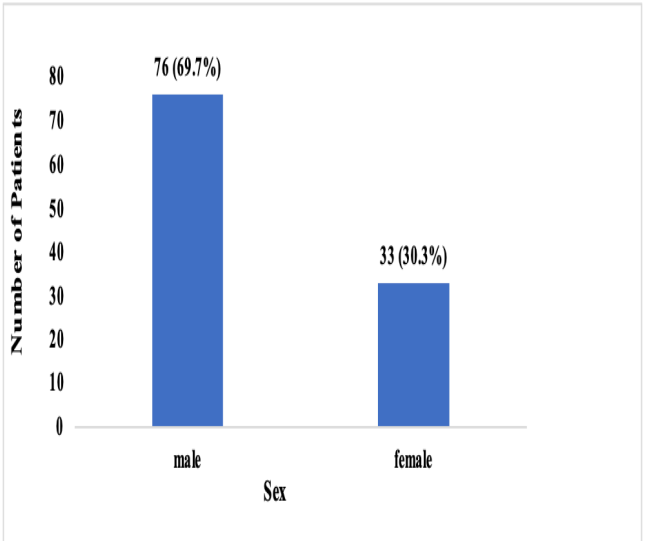

Figure 1: Sex of DR-TB patient

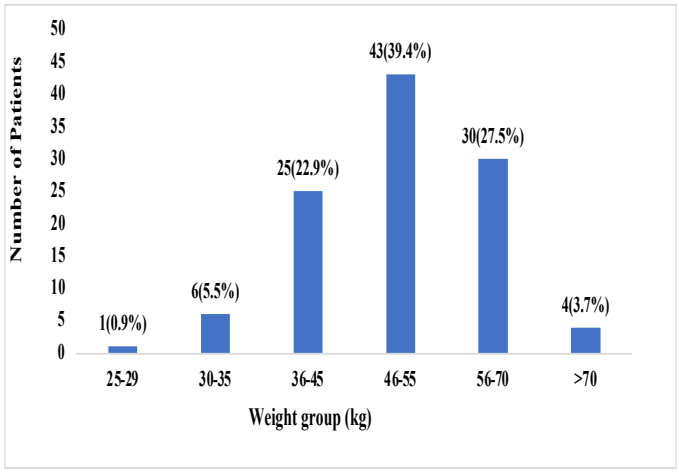

Figure 2: Weight of DR-TB patient

Figure no.2 shows Majority of patient i.e. 39.4% were in between of 46-55 kg. The study conducted by Bharati A, et.al on Treatment outcome of drug-resistant tuberculosis (DR-TB) following uptake of universal drug susceptibility testing showed that a total of 201 DR-TB patients, 31.3% of patients had normal weight, while maximum was into under-weight category (59.7%). Surprisingly, 9% of the isolates had overweight.[10]

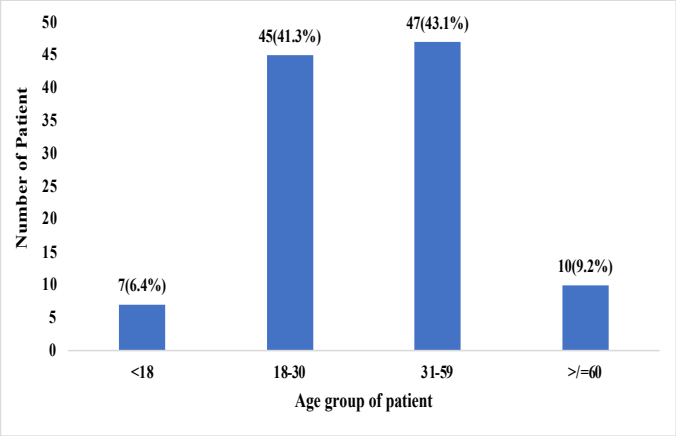

Figure no.3 shows that Maximum patient 47(43.1%) were middle aged adults in between the age group 31-59. The study conducted by Bharati A, et.al on Treatment outcome of drug-resistant tuberculosis (DR-TB) following uptake of universal drug susceptibility testing showed that a total of 201 DR-TB patients. Among all, majority of patients (42.3%) belong to younger (18–30 years) age group.[10]

Comorbidities in DR-TB patients

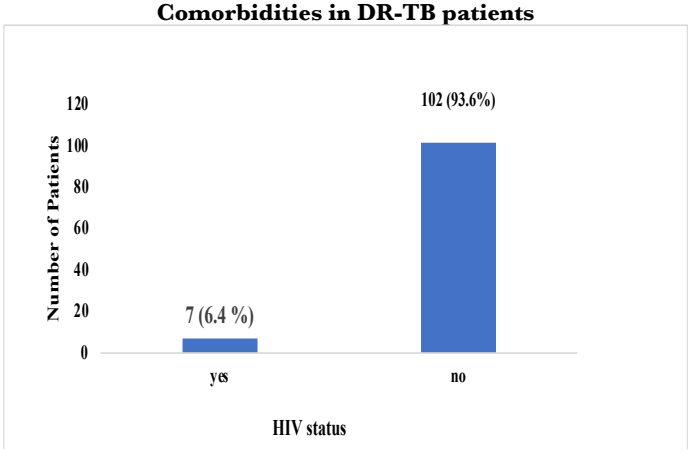

Figure 4: HIV status in DR-TB patient

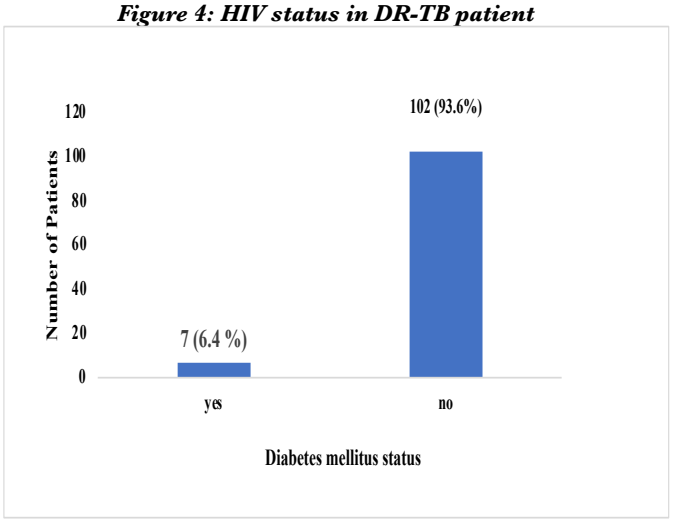

Figure 5: Diabetes mellitus status in DR-TB patient

Figure no.4 and 5. shows that Out of 109 enrolled DR-TB patients, comorbid individuals were 13.7% out of which 6.4% proportion were found to have HIV status positive and also 6.4% patients were found to have diabetes status positive. The study conducted by Bharati A, et.al on Treatment outcome of drug-resistant tuberculosis (DR-TB) following uptake of universal drug susceptibility testing showed that out of 201 DR-TB patients, 17.4% comorbid individuals were present in the following study, among them, majority were diabetics 16.4%, and 1.5% patients were HIV infected.[10]

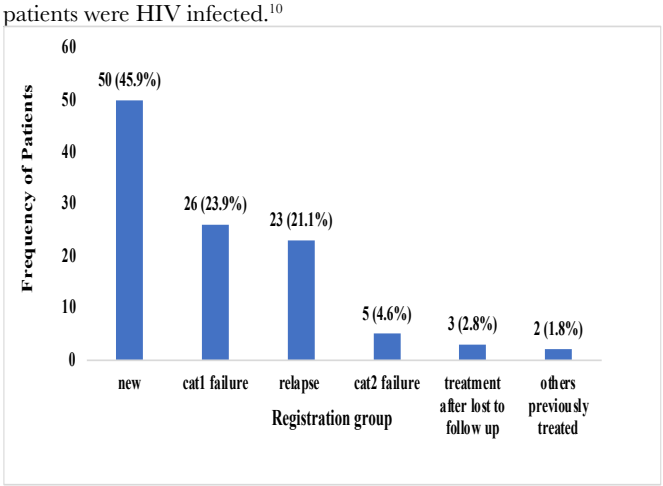

Figure 6: Registration of DR-TB patients

From above figure, among 109 enrolled DR patients, 50(45.9%) were new patient and rest i.e., 59 i.e. 50.5% (26+23+5+3+2) were previously treated patients. According to the national tuberculosis program Nepal (NTP) report, 392 MDR /RR-TB cases were enrolled (out of 635 notified) during FY 2075/76; 0.6% among new TB cases and 20% among the previously treated case (compared to 3.4% of new TB and 18% of previously treated cases globally).[9]

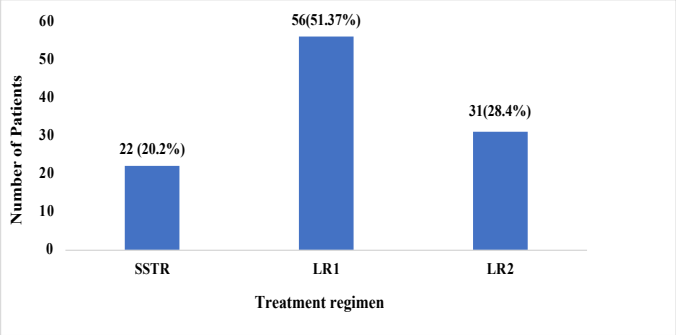

Figure 7: Treatment regimen of DR-TB patients

Figure no.7 shows that Among 109 ,56 patients (51.37%) were prescribed LR1 regimen, 31(28.4) were prescribed with LR2 and 22 (20.2%) were prescribed with SSTR regimen.

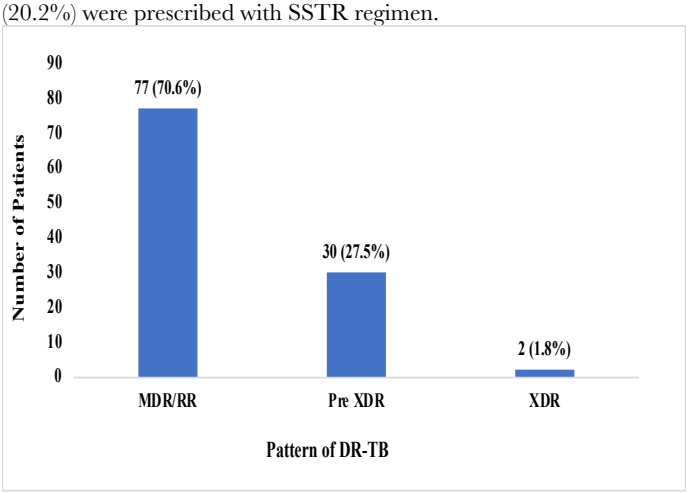

Figure 8: Pattern of Drug resistance tuberculosis in DR-TB patient

Figure no. 8 shows that on studying the pattern of drug resistance tuberculosis, out of 109 patients, 77 were found be MDR/RR TB, 30 had pre-XDR TB and 2 had XDR TB. The study carried out by Nagarajan c, et.al on Resistance pattern in drug resistance pulmonary tuberculosis showed that out of 309 patients, MDR pattern was observed in 224 (72%), Poly drug resistance pattern was observed in 72 (23.3%) and Mono drug resistance in 13 (4.2%).[11]

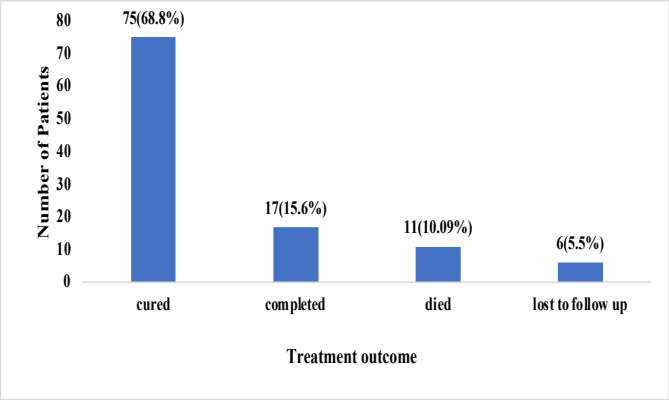

Figure 9: Treatment outcome of DR-TB patients

Figure no.9 shows that on determining the outcome of treatment of 109 DR TB patients, 75 i.e., 68.8 % more than half of patient were cured and 17 (15.6%) were completed and rest 10.1% died ,5.5 % lost to follow up and treatment success rate was 84.4% including 75 and 17 patients i.e.92. The study conducted by Bharati A, et.al on Treatment outcome of drug-resistant tuberculosis (DR-TB) following uptake of universal drug susceptibility testing. Of the 201 enrolled DR-TB patients, the majority (65) were cured followed by the treatment completed (64). The overall treatment success rate was 64.2%.[10]

CONCLUSION

Majority of DR-TB patients were male in our study, and a large number of them, 47, or 43.1%, belonged to the group of middle-aged adults (31–59). The most prevalent pattern seen was MDR/RR TB, and the LR1 treatment regimen was prescribed to the majority of patients. 84.4% patients were treated successfully.

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CONFLICTS OF INTEREST

No conflicts of interest are to be declared.