(e) ISSN Online: 2321-9599

(p) ISSN Print: 2348-6805

ORIGINAL ARTICLE

ASSESSMENT OF EFFICACY OF LEVOFLOXACIN AND MOXIFLOXACIN ON OUTCOME OF MULTIDRUG-RESISTANT TUBERCULOSIS TREATMENT: A COMPARATIVE RETROSPECTIVE STUDY

Shivnath Singh[1], Kanhaiya Prasad[1]

[1]Associate Professor, Department Of Medicine, GCRG Medical College, Bakshi ka Talab, Lucknow, U.P., India

ABSTRACT:

Background: Tuberculosis (TB) is one of the common causes of deaths occurring worldwide. Multidrug-resistance (MDR) is one of the commonest forms of TB encountered these days. Resistance due to drugs are bringing the need for their replacement with drugs of higher generation. Hence; we planned the present study to assess and compare the efficacy of levofloxacin or moxifloxacin on the outcome of MDR-TB. **Materials & methods**: The present retrospective study included assessment of efficacy of levofloxacin or moxifloxacin on the outcome of MDR-TB. Complete reviewing of data records of the age, body mass index (BMI), demographic, clinical and radiographic details of all the patients was done. We also assessed the details of the treatment therapy along with dosage of all the patients form their record file. Laserson et al. criteria were used for the assessment of outcome of the treatment.All the results were analyzed by SPSS software. **Results**: A total of 120 subjects were included in this retrospective study. 45 cases in the levofloxacin group and 47 cases in the moxifloxacin group had successful treatment outcome whereas in 10 and 7 cases of the levofloxacin and moxifloxacin group respectively, failure of treatment occurred. Non- significant results were obtained while comparing the outcome of treatment in both the study groups. **Conclusion**: Similar treatment outcome occurs in patients treated with either levofloxacin or moxifloxacin therapy.

Key words: Levofloxacin, Moxifloxacin, Tuberculosis.

Corresponding author: Dr. Kanhaiya Prasad, Associate Professor, Department Of Medicine, GCRG Medical College Bakshi ka talab, Lucknow, U.P., India

This article may be cited as: Singh S, Prasad K. Assessment of efficacy of levofloxacin and moxifloxacin on outcome of multidrug-resistant tuberculosis treatment: A comparative retrospective study. J Adv Med Dent Scie Res 2017;5(7):71-74.

Access this article online	
Quick Response Code	Website: www.jamdsr.com
	DOI: 10.21276/jamdsr.2017.5.7.18

INTRODUCTION

Tuberculosis (TB) is among the main sources of death around the world. The World Health Organization (WHO) gauges that 32% of the total populace is tainted with Mycobacterium tuberculosis, the causative operator of TB. There were an expected 9.2 million new TB cases and 1.7 million deaths from TB in 2006.[1, 2] Medication imperviousness to isoniazid and rifampin, the 2 most intense first-line drug for the treatment of TB, is expanding internationally. This is regularly alluded to as multidrug-resistance (MDR). In vitro tranquilize resistance of M. tuberculosis to any fluoroquinolone and to no less than one of the injectable medications (capreomycin, kanamycin, or amikacin), notwithstanding isoniazid and rifampin resistance, is characterized as widely extensively drug-resistant (XDR) TB.[3, 4]Strains of XDR TB are progressively found in HIV-seropositive people with TB in southern Africa, where these strains are passed by individual to individual contact. XDR TB has turned into a significant issue for the wellbeing organizations in this area. Interestingly, contaminations with XDR TB strains are once in a while found in Western Europe.[5- 7] Hence; we planned the present study to assess and compare the efficacy of levofloxacin or moxifloxacin on the outcome of MDR-TB.

MATERIALS & METHODS

The present study was conducted in the department of general medicine of the medical institute and included assessment of efficacy of levofloxacin or moxifloxacin on the outcome of MDR-TB. Ethical approval was taken from the institutional ethical committee. We included data records of all those MDR- TB patients that received either of the two above mentioned drugs in combination with other second line anti- TB drugs over a period of five years.According to data records, a minimum of isoniazid and rifampicin resistance was shown by all the patients during in- vitro drug susceptibility testing. Exclusion criteria for the present study included:

- Patients less than 20 years of age,
- Patients treated with both levofloxacin and moxifloxacin,

- Patients on treatment therapy of levofloxacin and moxifloxacin for a time period of less than three months

Complete reviewing of data records of the age, body mass index (BMI), demographic, clinical and radiographic details of all the patients was done. We also assessed the details of the treatment therapy along with dosage of all the patients form their record file. Laserson et al. criteria was used for the assessment of outcome of the treatment.[8] Based on this criteria and other clinical information, treatment outcome was classified into following types:

- Successful treatment
- Treatment outcome associated with adverse effects

All the results were analyzed by SPSS software. Chi-square test, student t test and uni-variate regression curve was used for the assessment of level of significance. P-value of less than 0.05 was taken as significant.

RESULTS

Data records of a total of 120 subjects were included in the present study. Surgical resection was done in 8 and 6 subjects of the levofloxacin and moxifloxacin group respectively. In 28 subjects of levofloxacin group, adverse drug reactions were recorded while in 32 subjects of moxifloxacin group, adverse drug reaction was recorded (**Table 1**). 45 cases in the levofloxacin group and 47 cases in the moxifloxacin group had successful treatment outcome whereas in 10 and 7 cases of the levofloxacin and moxifloxacin group respectively, failure of treatment occurred (**Graph 1**). Non- significant results were obtained while comparing the outcome of treatment in both the study groups (**Table 2**).

Table 1: Treatment modalities and adverse effect in patients of both the study groups

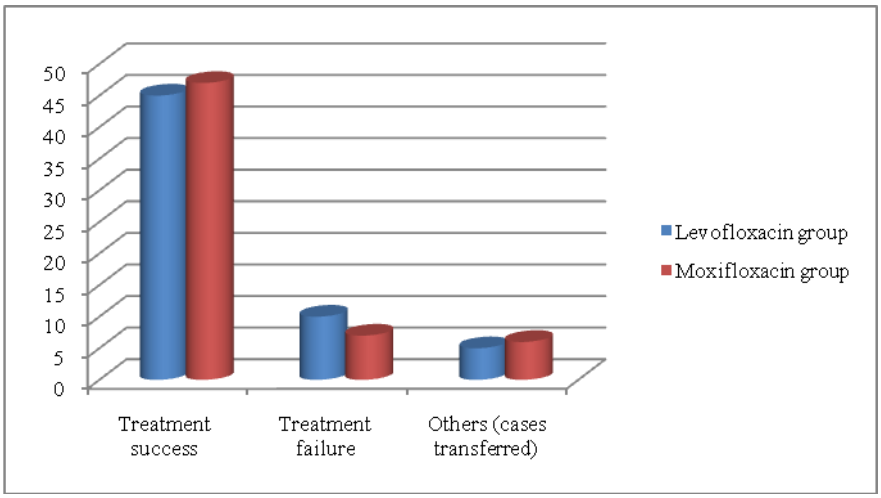
Parameter	Levofloxacin group	Moxifloxacin group	p- value
Number of Subjects	60	60	-
Surgical resection (no. of subjects)	8	6	0.52
Number of resistant drugs	2	5	0.02*
Adverse drug effects (no. of subjects)	28	32	0.33

*: Significant

Table 2: Outcome of treatment among patients of both the study groups

Parameter	Levofloxacin group	Moxifloxacin group	P- value
Treatment success	45	47	0.41
Treatment failure	10	7	0.35
Others (cases transferred)	5	6	0.20

Graph 2: Outcome of treatment among patients of both the study groups



DISCUSSION

MDRTB is substantially more hard to treat than completely helpless malady, requiring costly second-line drugs for no less than eighteen months (contrasted and less expensive first-line drugs for just six months).[7- 9] For completely vulnerable illness, cure rates will surpass 90% of every a well-run program, and the World Health Organization says that 75% is the base important to accomplish control in the group.[10- 12] Hence; we planned the present study to assess and compare the efficacy of levofloxacin or moxifloxacin on the outcome of MDR-TB.

In the present study, we observed that Lee J et al thought about the impact of levofloxacin and moxifloxacin on treatment results among patients with MDR-TB. A review examination of 171 patients with MDR-TB getting either levofloxacin or moxifloxacin was performed. Treatment reactions were classified into treatment outcome (cured and treatment finished) or antagonistic treatment result. The middle age of the patients was 42.0 years. Around 56% of the patients were male. Seventeen patients had drug-resistant tuberculosis, and 20 had a surgical resection. A total of 123 patients got levofloxacin for a middle 594 days, and 48 patients got moxifloxacin for a middle 673 days. Other pattern statistic, clinical, and radiographic qualities were comparable between the two gatherings. The moxifloxacin amass had an essentially higher number of safe medications and a higher occurrence of resistance to ofloxacin in the medication affectability test. The treatment achievement rate was 78.9% in the levofloxacin gathering and 83.3% in the moxifloxacin gathering. Unfavorable responses happened at comparable rates in the gatherings. Patients in the moxifloxacin assemble were not more prone to have treatment accomplishment than those in the levofloxacin gathering. Both levofloxacin and moxifloxacin demonstrated identical adequacy for treating MDR-TB.[13]Kwon YS et al assessed the treatment outcomes and prognostic factors for patients with MDR TB. To identify the prognostic factors related to favorable treatment outcomes, univariate comparison and multiple logistic regression were performed. Of 155 patients, 18 (12%) had newly diagnosed MDR TB, 81 (52%) had previously received treatment with first-line drugs, and 56 (36%) had received treatment with second-line drugs. The isolated strains were resistant to a median of 5 drugs. Twenty-seven patients had extensively drug-resistant (XDR) TB at the start of treatment. Outcome assessment revealed that 102 patients (66%) were cured or completed therapy. The treatment success rates did not differ significantly between patients with non-XDR MDR TB and those with XDR TB. Surgical resection was performed more frequently for patients with XDR TB than for those with non-XDR MDR TB. Combined surgical resection, body mass index >/=18.5, use of >4 effective drugs, and a negative sputum smear result were independent predictors of a favorable outcome. Early aggressive treatment comprising at least 4 effective drugs and surgical resection, when indicated, may improve the outcome for patients with MDR TB or XDR TB.[14]

Blöndal K et al assessed the treatment outcome of the first Green Light Committee (GLC) approved countrywide management of multidrug-resistant (MDR-) and extensively drug-resistant tuberculosis (XDR-TB) in Estonia and to evaluate risk factors contributing to TB recurrence over 8 years of follow-up.In 211 MDR- and XDR-TB patients, treatment success was 61.1%; 22.3% defaulted, 8.5% failed and 8.1% died. TB recurrence among successfully treated patients was 8.5%, with no significant difference between XDR-TB and MDR-TB. TB recurrence was associated with resistance to all injectables, resistance to a greater number of drugs, and sputum smear positivity. A history of previous TB treatment was associated with TB recurrence among successfully treated patients. The internationally recommended Category IV treatment regimens are sufficiently effective to cure 75% of adherent MDR- and XDR-TB patients. A history of previous treatment, resistance to all injectable agents and resistance to a greater number of drugs increase the recurrence of MDR- and XDR-TB.[15]

CONCLUSION

From the above results, the authors conclude that similar treatment outcome occurs in patients treated with either levofloxacin or moxifloxacin therapy. However, future studies are advocated for better exploration of this field of medicine.

REFERENCES

1. Mahadev B, Kumar P. Surveillance of drug resistance to antituberculosis drugs in district of hoogli in West Bengal and Mayurbhanj in Orissa. Indian J Tuberc. 2005;52:5–10.
2. Chambers HF, Deck DH. In: Basic and Clinical Pharmacology. 11th ed. Katzung BG, Masters SB, Trever AJ, editors. Noida, UP, India: Tata Macgraw- Hill; 2009.
3. Koh WJ, Kwon OJ, Suh GY, Chung MP, Kim H, Lee NY, et al. 6-Month therapy with aerosolized interferon-gamma for refractory multidrug resistant pulmonary tuberculosis. J Korean Med Sci. 2004;19:167–71.
4. Chelnokova OG, Kirbik BS. Use of isofone in combined treatment of patients with acutely progressive forms of tuberculosis. Probl Tuberk Bolezn Legk. 2003;9:12–4.
5. Ahmad S, Mokaddas E. Recent advances in the diagnosis and treatment of multidrug-resistant tuberculosis. Respir Med. 2009;103:1777–90.
6. Dincer I, Ergin A, Kockagoz T. The vitro efficacy of b-Lactam and b-Lactamase inhibitors against multidrug resistant clinical strains of Mycobacterium Tuberculosis. Am J Resp Crit Care Med. 2004;169:1103–9.
7. Chhabra N, Aseri ML, Dixit R, Gaur S. Pharmacotherapy for multidrug resistant tuberculosis. Journal of Pharmacology & Pharmacotherapeutics. 2012;3(2):98-104.
8. Laserson KF, Thorpe LE, Leimane V, et al. Speaking the same language: treatment outcome definitions for multidrug-resistant tuberculosis. Int J Tuberc Lung Dis 2005;9:640-645.
9. Xie JP, Yue J, Xiong YL, Wang WY, Yus Q, Wang HH. In vitro activities of small peptides from snake venom against clinical isolate of drug-resistant Mycobacterium tuberculosis. Int J Antimicrob Agents. 2003;22:172–4.
10. Munro Aw, Mclean KJ, Marshall KR, Warman AJ, Lewis J, Roitel O, et al. Cytochrome p 450: Novel drug targets in the tuberculosis. Biochem Soc Trans. 2003;31:625–30.

11. Toyohara M, Nagata A, Hayano K, Abe J. Study on the antitubercular activity of tuberactinomycin, a new antimicrobial drug. Am Rev Repir Dis. 1986;100:228–30.
12. Dresser LD, Rybak MJ. The pharmacologic and bacteriologic properties of oxazolidinones, a new class of synthetic antimicrobials. Pharmcotherapy. 1998;18:456–62.
13. Lee J, Lee CH, Kim DK, Yoon HI, Kim JY, Lee SM, Yang SC, Lee JH, Yoo CG, Lee CT, Chung HS, Kim YW, Han SK, Yim JJ. Retrospective comparison of levofloxacin and moxifloxacin on multidrug-resistant tuberculosis treatment outcomes. Korean J Intern Med. 2011 Jun;26(2):153-9.
14. Kwon YS, Kim YH, Suh GY, Chung MP, Kim H, Kwon OJ, Choi YS, Kim K, Kim J, Shim YM, Koh WJ. Treatment outcomes for HIV-uninfected patients with multidrug-resistant and extensively drug-resistant tuberculosis. Clin Infect Dis. 2008 Aug 15;47(4):496-502.
15. Blöndal K, Viiklepp P, Guðmundsson LJ, Altraja A. Predictors of recurrence of multidrug-resistant and extensively drug-resistant tuberculosis. Int J Tuberc Lung Dis. 2012 Sep;16(9):1228-33.

Source of support: Nil **Conflict of interest:** None declared