# Starting a newer shorter MDR regimen for MDR-TB at a district TB center for the first time- A case report from a heavy center in Western Delhi

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## Abstract:
Drug Resistant TB is a challenge for a country like India where there is highest prevalence of MDR cases in the world. With decentralizing and smooth accessibility of the Gene Xpert, it has become quick and easy to rule out the drug resistance. Unlike the conventional CAT-IV treatment of about 24 months, a newer shorter regimen of MDR TB treatment has been started in selected cases like pulmonary MDR-TB (when there is no resistance of FQs% or SLIs on the second line LPA). We herein, present a case of secondary pulmonary MDR-TB, who has been started on a newer shorter MDR regimen treatment for the first time at a very large and heavily burdened center in the Western part of the national capital of India.

**Keywords:** Gene Xpert; LPA; MDR; SLI; TB.

## Introduction:
Tuberculosis (TB) is a contagious disease caused by Mycobacterium [1]. It is estimated that 130,000 cases of MDR-TB/RR-TB emerged in India, of whom 79,000 were among notified cases of TB in 2015 [2]. Of the 79,000 MDR-TB/RR-TB cases, only 28,876 (36%) were diagnosed with 26,988 (34%) started on treatment and treatment success rate was only 46% [2]. Despite enormous efforts, still TB is a public health problem in various parts of world, including India, which has the highest TB cases in world [1]. In the recent times, prevalence of drug resistance TB (DR-TB) is increasing. India has highest burden of both TB and MDR-TB based on the WHO estimates reported in the Global TB Report 2016 [3]. Resistance of TB drugs among patients can be Multi Drug Resistance (MDR), whose biological sample is resistant to both Rifampicin and Isoniazid, with or without resistance of other first line drugs [4]. It can also be Rifampicin Resistance (RR) or H-Mono resistance having resistance of Isoniazid only or even more serious form of drug resistance i.e., XDR (Extensively Drug Resistance) TB where the patient is resistant of Fluoroquinolones and SLIs (second line injectables) like Kanamycin, Amikacin or Capreomycin along with resistance of 1st line antitubercular drugs. Treatment of MDR-TB is a tedious job. Patients are advised to take treatment for 24 months once diagnosed as MDR-TB, as per the conventional regimen. Recently a shorter regimen (also known as Bangladesh Regimen) [5] has been introduced in selective cases of MDR-TB from the year 2016. Shorter regimen is patient friendly, as patient has to take the medications for 9-11 months only with an intensive phase of 4 to 6 months [6,7]. Here we present a case report of an adult Indian patient who has been started on a newer shorter MDR regimen from Western Delhi. This is the first case started from a very heavily burdened center in the national capital that was started on the new novel regimen.

## Case Report:
An 18 years old Indian male, unmarried, from a low socioeconomic background [8] came to our OPD with the chief complaints of cough and fever since 20 days, there was also reduced appetite since last 15 days. Fever was unrecorded, low grade, not associated with chills and rigor, rashes or vomiting. Fever used to rise in evening. There was no history of night sweats. There was no history of melena, hematemesis or epistaxis. Patient was also suffering from cough which was productive. Expectorant was copious, non foul smelling and yellow in color. Cough was also associated with hemoptysis off and on. Patient also had a history of decreased appetite and had meals twice a day. There was no significant weight loss, breathlessness or chest pain. Patient did not have any addictions and had his home at a very congested locality in West Delhi. Family was a joint family and the ventilation at residence was inadequate with overcrowding. There was a past history of pulmonary MDR-TB for which he had taken CAT IV conventional treatment for 24 months and had completed his course six months back when his last three culture reports were negative. Besides, he had a history of being treated for CAT-I and CAT-II TB in the past with outcomes as cured and shifted to MDR-TB treatment respectively.

On general examination, he was an average built male weighing 51 kg, neither dyspnic nor cyanosed, well oriented to time place and person. He was afebrile and vitals were stable. Pallor was present. There was no icterus, lymphadenopathy or edema. On systemic examination, dull note was found on the left hemi thorax and vocal repercussions were reduced, auscultation revealed decreased breath sounds. There

were crepts in the left side of the chest. Rest of the systemic examinations was normal.

From the above symptoms, he was advised for a sputum for AFB test, which came out as sputum positive (+1), subsequently investigation of CBNAAT was done to rule out resistance of Rifampicin. On the basis of Gene Xpert (CBNAAT) and 2nd line DST reports, he was diagnosed as pulmonary MDR-TB and was considered as a suitable candidate for starting shorter regimen treatment of MDR-TB. Before starting the shorter MDR treatment, as per guidelines, he had to undergo pretreatment evaluation and thus got clearance from Department of Psychiatry (regarding his mental health status), and Dept of ENT for audiogram (if any hearing problem). Lastly patient also took a surgical clearance regarding lung resection.

Lab investigations included complete haemogram that showed Hb as 12.0 gm/dl, TLC as 6500/cmm, DLC (P 77, L 16, E 1, M 6) and platelet count as 3.9/cmm. Renal function tests showed urea as 14mg/dl, S. creatinine as 0.5mg/dl. LFT was also normal and total bilirubin was 0.6mg/dl, SGOT and SGPT were 14 and 17mg/dl respectively. Blood sugar was also done which came out as 108 mg/dl (Fasting). Urine (routine/microcsopic) was normal. On thyroid profile, he was euthyroid (TSH- 1.32). HIV status was non reactive. ECG was normal with sinus rhythm. Chest X-Ray (PA view) showed haziness in the left upper lobe (Fig. 1).

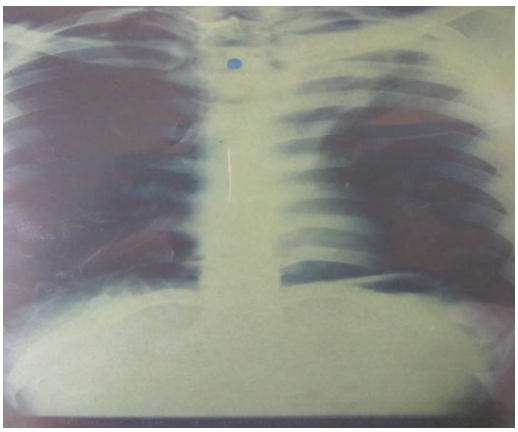

**Fig. 1: Chest X-Ray (PA view) showing haziness in the left upper lobe**

After reviewing routine reports of above investigations and clearance from the DR-TB committee, patients was started in the intensive phase of shorter regimen MDR regimen from our District TB Centre for the first time with following drugs- Kanamycin, Ethionamide, Moxifloxacin, Clofazimine, Pyrazinamide, Isoniazid and Ethambutol. Shorter regimen comprises IP for 4-6 months and CP for 5 months so the total duration of this regimen would be reduced to 9-11 months from the conventional 24-30 months regimen [9]. Regular follow-up sputum examinations are advised. Currently patient is on shorter MDR regimen since last one month and the treatment is not associated with any adverse events. A written informed consent was obtained from the patient for publishing the case details and the images.

## Discussion:

Drug resistant tuberculosis is a public health problem in a country like India which is 2nd most populous nation in the world [1]. Reason for this is primarily the contagious nature of the disease and the low socioeconomic strata of the developing world. The global tuberculosis report 2016 estimated that 3.9 percent newly diagnosed and 21 percent of previously treated TB cases had MDR-TB [3]. MDR TB most commonly involve lungs, so chances of spreading the infection are always high and conventional treatment course has been long and is of 2 years causing a number of issues related to the patients, drugs, etc. resulting in a number of loss of follow-up of patients and sometimes deaths [7]. Observational studies in Bangladesh and several African countries have shown a success rate of 84% using a shorter regimen [7,10], which is better than conventional CAT IV treatment of 24 months. As shorter regimen is almost half the duration of the conventional one, chances of adverse drug reactions are less and compliance would be better [7]. However, there are certain snags associated with this newer short course regimen [9]. There is a need of rapid DST and in many settings such fast results of DST may not be available and this could hamper the initiation of this regimen [7]. There are also limitations of Bangladesh Regimen as it is not indicated, if the second line LPA (Line Probe Assay) showed resistance to Fluoroquinoles and/or SLI (Second Line Injectables) [7]. This newer regimen is also not recommended in pregnant females, and extrapulmornary MDR cases except TB of lymph nodes or tubercular pleural effusion [7]. Study shows that only about 30% of patients with MDR-PTB diagnosed in this sample from South-east Asia would be eligible for the WHO shorter MDR-TB treatment regimen [7]. Besides, there is primary resistance to fluoroquinolones or SLIs up to 10% and that of Pyrizinamide found to be 35-81% [7, 9,11]. Despite these issues a newer shorter regimen is imperative for the treatment of MDR-TB cases in India.

## Conclusions:

Drug resistant TB is a challenge for both health care providers and patients. As pulmonary MDR-TB can be a serious threat to society, a successful and feasible treatment is the need of time. Shorter regimen can be a boon for patients as it is patient friendly, cost effective, is associated with a reduced pill load and the duration of treatment for the patient is also less. Adherence to the treatment, proper counseling, nutritious diet and family support are mandatory to control this bacterial infection. Patient and family both

have to understand various preventive measures to combat MDR-TB along with usage of antitubercular drugs.

**Conflicts of Interest:** None declared

**Acknowledgements:** None

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