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EC OPHTHALMOLOGY
Case Report

A Case Report: 3-Year, 8-Month-Old Child with Multidrug-Resistant TB, Weight Loss, Disturbed Mental Health (Aggressive), Excessive Usage of Screen Time (Eye Health)

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Abstract

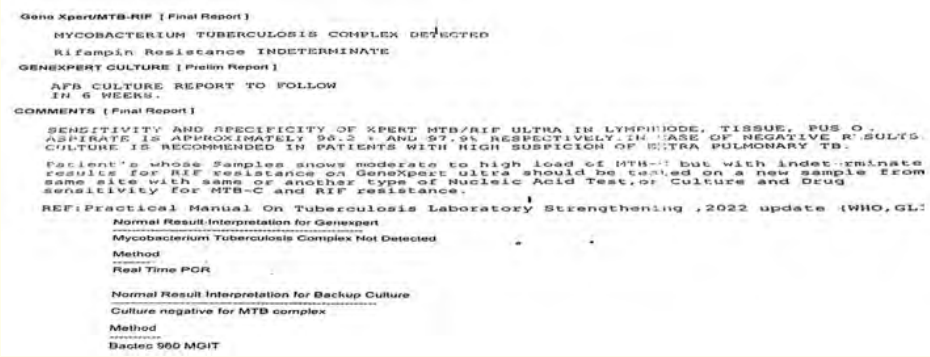
Tuberculosis was a fatal disease in the past, but now different treatment options are available to treat and reduce the disease progression. Multidrug-resistant TB is also a type of tuberculosis that is resistant to some drugs. Multidrug-resistant TB is rare in children, but the MDR-TB unit of Fatima Jinnah Chest Institute of Disease Quetta diagnosed the patient with drug-resistant rifampicin. On chest x-ray diagnosed with unilateral disease with of 2-3 zones and no family history of tuberculosis. A 3-year 8-month-old immunocompetent boy presented with multidrug-resistant TB, weight loss, highly aggressive, excessive usage of screen. Base line parameters of child were (temperature 98F, Pulse 72/min, Respiration 22/min, weight 14 kg, height 3ft respectively). The child was treated with medication bedaquiline, linezolid, levofloxacin. Patients cured after 12 months of follow up. On follow-up of every month mental health, weight and visual impairment was measured. This case of child emphasise the importance of taking a very proper history and review the possibility of MDR, especially in countries where tuberculosis is uncontrolled. So early diagnose, timely treatment and regular check-ups, we can reduce the disease progression and complications. By early management we can reduce the mortality rate in children due to fetal diseases.

Keywords: *Multidrug-Resistant TB; Weight Loss; Disturbed Mental Health; Screen Time*

Case Report

A 3-year, 8-month-old child with multidrug-resistant TB, weight loss, disturbed mental health (aggressive), excessive usage of screen time (eye health) was reported in Fatima Jinnah chest institute of disease Quetta in September 2023. Parents was complaining that the child had fever, loss of appetite, aggressive and weight loss. Base lime Vital signs of child were measured temperature 98F, Pulse 72/min, Respiration 22/min, Bp 75/110 mmhg, height 3ft and weight was 14 kg shown in table 1. After examination in lab test diagnosed with TB shown in report 1. Acid fast Bacilli smear test also was performed to check the drug resistance in which child was showing resistance to rifampicin which was fall in MDR-Tb shown in report 2. According to previous study ninety five percent rifampicin resistance patients also show resistance to isoniazid, we considered rifampicin resistance to be a main indicator of MDR-TB [1].

MDR-TB treatment regimen used levofloxacin 200 mg (lfx mg/d), Bedaquiline 200 mg (bdq mg/d) and Linezolid 150 mg (Lzd mg/d) for 12 months follow up shown in table 2. on every follow up, General condition, mental health, visual impairment blood pressure of child



Gene XpertMTB-RIF [Final Report]

MYCOBACTERIUM TUBERCULOSIS COMPLEX DETECTED

Rifampin Resistance INDETERMINATE

GENEXPERT CULTURE [Prelim Report]

AFB CULTURE REPORT TO FOLLOW IN 6 WEEKS.

COMMENTS [Final Report]

SENSITIVITY AND SPECIFICITY OF XPERT MTB/RIF ULTRA IN LYMPH NODE, TISSUE, PUS O. ASPIRATE IS APPROXIMATELY 96.2 % AND 97.9% RESPECTIVELY.IN CASE OF NEGATIVE RESULTS. CULTURE IS RECOMMENDED IN PATIENTS WITH HIGH SUSPICION OF EXTRA PULMONARY TB.

Patient's whose Samples shows moderate to high load of MTB-T but with indeterminate results for RIF resistance on GeneXpert ultra should be tested on a new sample from same site with same or another type of Nucleic Acid Test,or Culture and Drug sensitivity for MTB-C and RIF resistance.

REF:Practical Manual On Tuberculosis Laboratory Strengthening ,2022 update (WHO,GL:

Normal Result Interpretation for Genexpert

Mycobacterium Tuberculosis Complex Not Detected

Method

Real Time PCR

Normal Result Interpretation for Backup Culture

Culture negative for MTB complex

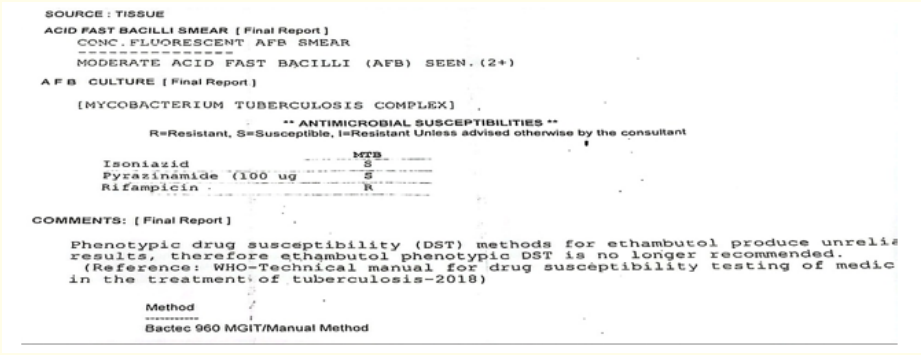
Method

Bactec 960 MGIT

Report 1: Gene expert.

Vital sign					
Temp Fahrenheit	**Pulse (/min)**	**Respiration (/min)**	**BP mmHg**	**Height**	**Weight**
98F	72/min	22/min	75/110	3ft	14 kg

Table 1: *Base line examination.*



SOURCE : TISSUE

ACID FAST BACILLI SMEAR [Final Report]

CONC. FLUORESCENT AFB SMEAR

MODERATE ACID FAST BACILLI (AFB) SEEN. (2+)

A F B CULTURE [Final Report]

[MYCOBACTERIUM TUBERCULOSIS COMPLEX]

** ANTIMICROBIAL SUSCEPTIBILITIES **

R=Resistant, S=Susceptible, I=Resistant Unless advised otherwise by the consultant

	MTB
Isoniazid	S
Pyrazinamide (100 ug	S
Rifampicin	R

COMMENTS: [Final Report]

Phenotypic drug susceptibility (DST) methods for ethambutol produce unreli results, therefore ethambutol phenotypic DST is no longer recommended. (Reference: WHO-Technical manual for drug susceptibility testing of medic in the treatment of tuberculosis-2018)

Method

Bactec 960 MGIT/Manual Method

Report 2: *Acid fast bacilli smear test.*

was assessed shown in table 3. After treatment child was cured on 12 months follow-up. Mental health (depression/anxiety) of child was better with time. Eye health was also good with time due to decrease of screen usage no optic neuropathy detected in child examining by ophthalmoscope. Blood pressure was normal throughout the treatment. General condition was sometime dropped and sometime was normal. By timely treatment of patients, we can cure to give a healthy life to individuals. We can reduce the disease progression in adults as well as in children. This study showed that the child response to therapy was positive. So, the child stabilized with the MDR-TB treatment regimen, treatment was schedule for a total time period of 12 months follow-up. The young child was discharged with some guidelines for regular follow-up every four months to check the efficacy and control of disease progression.

Date of treatment start	**Lfx mg/d**	**Bdq mg/d**	**Lzd mg/d**	**Weight**
21-09-2023	200 mg	200/100	150 pmg	14 kg

Table 2: *MDR-TB treatment regimen.*

Serial No	Date of visit	General condition	Mental health Depression/anxiety	Visual impairment	BP	Optic nerve neuropathy	Any other	Medicine
1	3-10-2023	Dropped	Moderate/mild	No	Normal	No	No	Given
2	4-11-2023	Dropped	Mild/mild	No	Normal	No	No	Given
3	3-12-2023	Dropped	Mild/moderate	No	Normal	No	No	Given
4	2-01-2024	Normal	Mild/mild	No	Normal	No	No	Given
5	3-02-2024	Dropped	Moderate/moderate	No	Normal	No	No	Given
6	2-03-2024	Normal	Mild/moderate	No	Normal	No	No	Given
7	4-04-2024	Dropped	Mild/mild	No	Normal	No	No	Given
8	9-05-2024	Dropped	Mild /Mild	No	Normal	No	No	Given
9	7-06-2024	Normal	Normal /normal	No	Normal	No	No	Given
10	4-07-2024	Normal	Normal/normal	No	Normal	No	No	Given
11	26-8-2024	Normal	Normal/normal	No	Normal	No	No	Stop
12	28-09-2024	Normal	Normal/normal	No	Normal	No	No	Cured

Table 3: *Follow ups.*

Discussion

Since 460 BC tuberculosis was present in world, as the most common disease of the time and it was life threatening. *Mycobacterium tuberculosis* is the causative factor of disease which is a slow-growing bacteria in nature and spread via inhalation of droplets contaminated with *Mycobacterium* [2]. But with passage of time TB is still the most common fatal disease and a most important public health problem, infecting about millions of people globally. 10 millions individuals affected of Tuberculosis annually and 1.3 million children also included. Most affected area of World are eight south Asian countries [3]. Drug resistance tb treatment success ratio are remains high, about 71% of cases achieve successful treatment. It is very crucial and challenging task to diagnose MDR TB in children. In young child the cases of MDR-TB is rare. In children earlier diagnosis of MDR-TB also possibility of meningitis so we should take detailed exposure past history and cerebrospinal Gene Xpert testing. Family history of patients is very important to clarified the diagnosis and treatment. In this case report child have no family history of disease, no history of meningitis after performing CT Scan, no history of visual impairment (no myopia due to excessive screen time), no optic neuropathy pathy. This case report elaborated the resistance to rifampicin (MDR-TB).12 months of daily levofloxacin bedaquiline and Linezolid is recommended for such case. After treatment positive response seen in child. The limited availability of testing such as GeneXpert and trained healthcare in underdeveloped countries limit the timely diagnosis and treatment. In TBM well recognized complication is Hydrocephalus, two-thirds of affected patients are reported. It causes the obstruction of cerebrospinal fluid pathways due any change in host immune system response to infection such as TB. But in our case CSF regulation was normal. In the past studies showed that about 65% of patients have hydrocephalus at initial diagnosis, which indicate the importance of timely diagnosis and treatment plan for disease progression [4,5]. Optic atrophy is a another common complication of TBM, 27-72% of patients showed vision problem and in some cases leads to permanent visual loss [6,7]. The optic neuropathy is caused by underlying mechanisms including ischemia, arachnoiditis-related inflammation, optic nerve chiasmal compressions (hydrocephalus), inflammation of optic disc from increased intracranial pressure, due to inflammation of occipital infarction and toxicity due to drugs [7]. Therefore, the severity of visual impairment depend upon the antituberculosis therapy as well as change in intra cranial pressure (CSF). In this case report the visual acuity, optic nerve assessment through ophthalmoscope was performed in every follow-up. There was no visual impairment was seen in child after treatment in every follow up. While child was using excessive screen time, no myopia detected. Heart rate and blood pressure was also monitor in every follow up. After treatment patient give positive response and cured in 12 months. So

early diagnose, timely treatment and regular check-ups, we can reduce the disease progression and complications. By early management we can reduce the mortality rate in children due to fetal disease.

Conclusion

In children diagnosis of multidrug-resistant tuberculosis is very challenging and suspicious. It is essential to check the TB causing bacteria (*Mycobacterium tuberculosis*) by using method GeneXpert as well as bacteria in cerebrospinal fluid and also check the patient fall in TB or in multidrug-resistant TB. Patients with MDR-TB may present with disturb mental health as well as optic atrophy resulting from medication of TB which can cause sudden loss of vision. So, the most important message for us was to not forget to focus on taking a detailed history and background knowledge of this fetal disease in Pakistan especially in pediatric patients with multidrug-resistant TB features. So early diagnose, timely treatment and regular check-up, we can reduce the disease progression and complications. By early management we can reduce the mortality rate in children due to fetal disease.

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