MDR-TB Case Study

A Deeper Dive into TB Nurse Case Management

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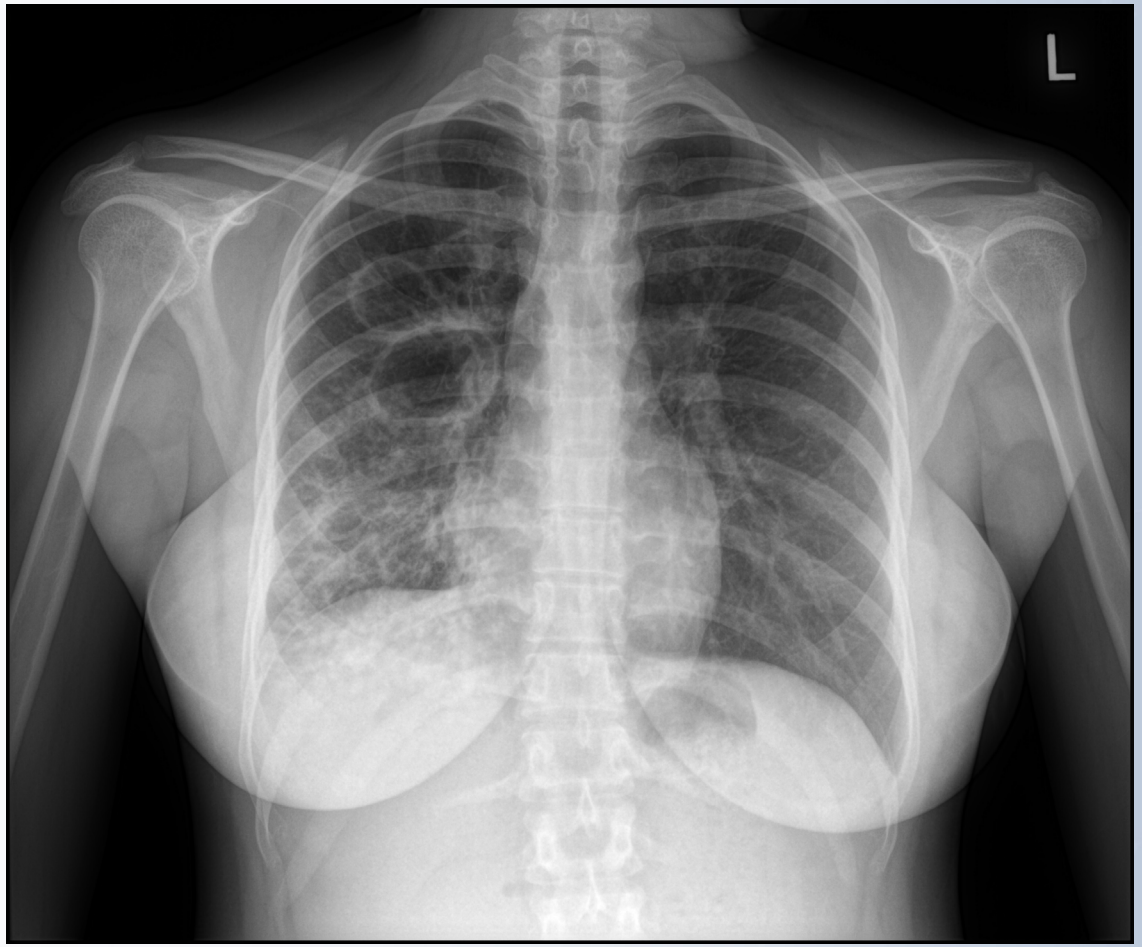
Case Study

- A 33 y/o lady, refugee from Nepal, presented at ED with cough, hemoptysis, fever, chills, night sweats, fatigue and weight loss. A chest X-ray was taken and showed: RUL cavitary pulmonary TB.
- She and her husband immigrated to the United States 4 years ago.
- Previous TB treatment in Nepal (“On and off”) when she was a teenager but not able to recall the medications that she received
- Married, housewife speaks little English, no children

Chest X-ray (Baseline)



Question #1

Does her previous TB treatment impact her current treatment plan?

Are there any risk factors for “drug-resistant TB”?

Case Study Continued

- ✓QuantiFERON Gold Positive
- ✓Sputum collection: AFB smear (+) NAAT (+) for MTB
- ✓Labs remarkable for: A1C 7.8%
- ✓Pregnancy test (-)

Question #2

If you suspect drug-resistant TB, what test should be done?

Question #3

What other test(s) may be needed to confirm drug-resistant TB?

MDDR Report

CDC Specimen ID: [redacted]
Specimen: *M. tuberculosis* complex isolate
Medium: MGIT broth

Date Collected: 04/13/2020
Date Received: 04/28/2020
Date Reported: 04/30/2020

Patient: [redacted] Submitter Specimen Identifiers: [redacted]

Results for Molecular Detection of Drug Resistance (Sanger Sequencing, complete panel); Conventional Drug Susceptibility Test in progress.

Locus (region) examined*	Result	Interpretation (based on in-house evaluation of 550 clinical isolates)
rpoB (RRDR)	Mutation: TCG>TTG; Ser531Leu	Rifampin resistant (100% of isolates in our in-house evaluation of 550 clinical isolates with this mutation are RMP-R.)
inhA (promoter)	No mutation	Isoniazid resistant. (100% of isolates in our in-house evaluation of 550 clinical isolates with this mutation are INH-R.)
katG (Ser315 codon)	Mutation: AGC>ACC, Ser315Thr	
embB (Met306, Gly406)	No mutation	Cannot rule out ethambutol resistance. (79% of EMB-R isolates in our in-house evaluation of 550 clinical isolates have a mutation at this locus.)
pncA (promoter, coding region)	No mutation	Cannot rule out PZA resistance. (86% of PZA-R isolates in our in-house evaluation of 550 clinical isolates have a mutation at this locus.)
gyrA (QRDR)	No mutation	Cannot rule out fluoroquinolone resistance. (80% of FQ-R isolates in our in-house evaluation of 550 clinical isolates have a mutation at this locus.)
rrs (1400 region)	No mutation	Cannot rule out resistance to injectable drugs (kanamycin, capreomycin, amikacin). (In our in-house evaluation of 550 clinical isolates: • 91% of AMK R isolates have a mutation in the rrs locus, • 87% of KAN-R isolates have a mutation in either the rrs locus or the eis locus; • 55% of CAP-R isolates have a mutation in either the rrs locus or the tlyA locus.)
eis (promoter)	No mutation	
tlyA (entire ORF)	No mutation	

*A negative result (e.g., no mutation) does not rule out contributory mutations present elsewhere in the genome.

MDDR assays were developed and the performance characteristics determined by the DTBE Reference Laboratory. They have not been cleared or approved by the Food and Drug Administration.

Question # 4

Based on the MDDR report, what can be concluded?

Case Study Continued

- Patient was place in isolation, she was stable and had received fluids and meds to control fever and chills
- Consultation with an expert was requested
- Hospital case manager is using a translator to communicate with patient and to provide patient education
- Patient is a little anxious to start treatment and health care providers are waiting for recommendations….

Question #5

What should be done prior to starting any TB regimen?
Baseline assessment?

Case Study Continued

Patient was evaluated and labs were taken:

- **Medical evaluation:** Productive cough, night sweats, fatigue, and weight loss
- **Chest X-ray** : RUL and middle lobe cavitary pulmonary TB
- **Baseline labs**: CBC: H&H 10.8/33, CMP: Normal
- **Mental Health assessment**: Mild anxiety
- **Vision test**: Normal **Ishihara Test**: Normal
- **Peripheral neuropathy** : Normal
- **EKG**: QTc: 426

Discussion about labs and evaluations…

Review EKG… what should you look for?

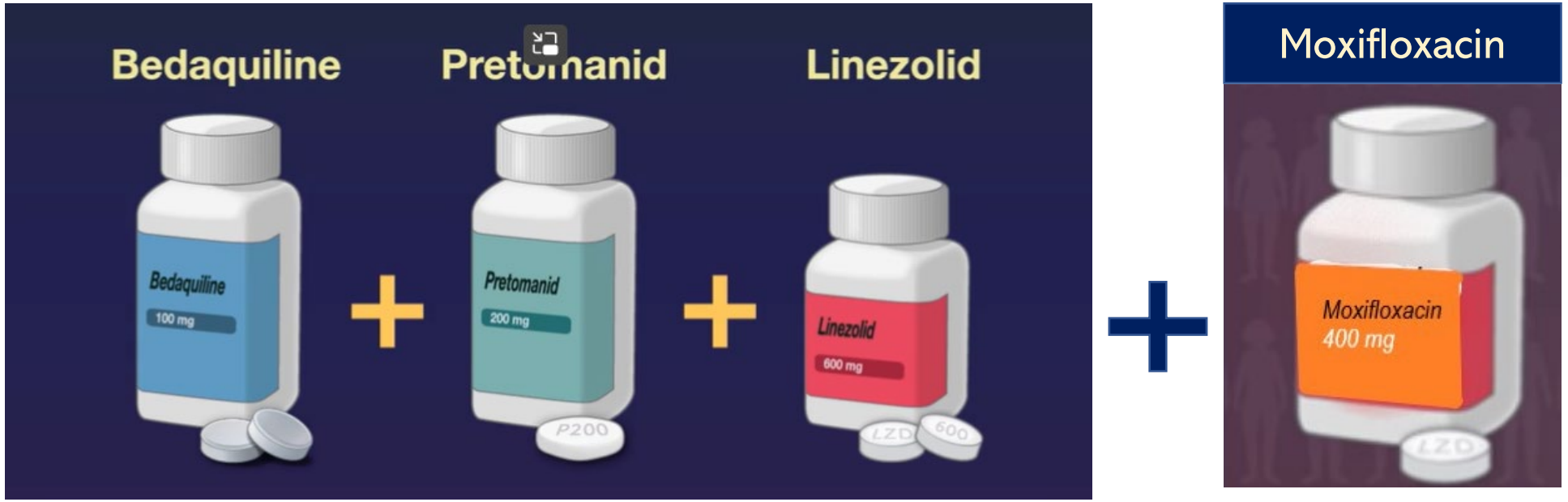
Question #6

Does she meet the criteria to use the standardized short regimen?

Case Study Continued

Recommendations were given:

- 6 months of Bedaquiline-Pretomanid-Linezolid (600mg) and Moxifloxacin regimen was recommended **(BPaLM)**



Case Study Continued

Patient starts BPaL + Moxi, daily & monthly monitoring has been done

Monthly sputums taken

AFB smear consistently (-) for 1 month after initiation of Rx

Culture (-) at 2 months of treatment

Symptoms: dry cough, other symptoms resolved

Discussion in groups about monitoring

See Monitoring chart

Case Study Continued

Patient appeared to be doing well, but in her fourth month of treatment, she started having complaints of mild numbness and tingling in her hands

Question #7

Which medication in her MDR-TB regimen might be attributed to peripheral neuropathy? Any other thoughts?

Case Study Continued

Physicians asked for Linezolid serum levels trough and peak as well as A1C…

Patient report that she is not taking the medications for diabetes….

See reports: serum drug levels

How do you interpret this report?

…and the A1C?

Question #8

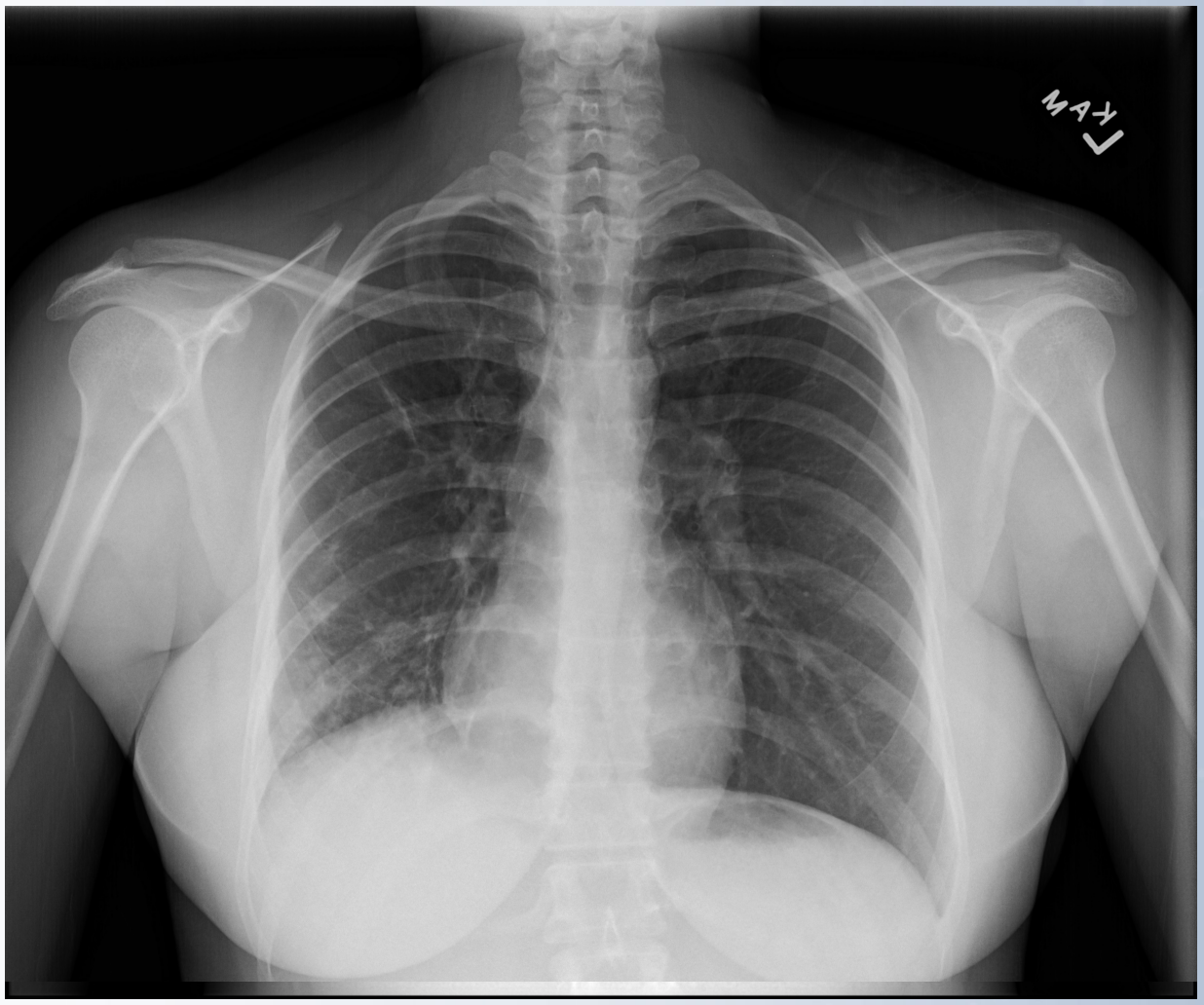
Do you think that the TB meds should be stopped?

Case Study Continued

Patient completed 6 months (26 weeks) of treatment with BPaL + Moxi. Good tolerance to TB meds, she gained weight, cough subsided…

See Chest X-ray next slide

Chest X-ray (End of Treatment)



THANK YOU!