Tuberculosis Medication Side Effects: Best Nursing Practice

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Objectives

• Become familiar with front line tuberculosis medication
• Identify common side effects of tuberculosis medication
• Discuss importance of nutrition in tuberculosis treatment

Tuberculosis Terms

• Infectious Disease
• Infection
• Disease
Pills, pills, pills... and their side effects...

Front line Tuberculosis Meds
- Isoniazid (INH) inhibits cell wall synthesis
  - Avoid antacids with aluminum
- Rifampin (RIF) disrupts RNA synthesis
  - Rifabutin- HIV/TB co-infected
- Ethambutol (EMB) inhibits cell wall synthesis
  - Stopped after 2 months if pan-susceptible, why?
- Pyrazinamide (PZA) affects fatty acid synthesis
  - “Shortening agent” from 9 to 6 months
Short course vs. long course

- Infection treatment vs. disease
- 6 months is considered “short course”
- 12-18 months is no longer a short course
  - usually due to MDR-TB or HIV/TB
  - non-adherence

EMB

- **Visual Acuity Testing**: concern of ocular toxicity
  - If long course is expected conduct test
  - If short course is anticipated, testing not needed
  - If vision changes then assess
PZA
- 1-2 months for pan susceptible tuberculosis, beyond 2 months limited effectiveness
- Most likely to cause hepatotoxicity
- Gastrointestinal issues
- Gout concerns

Rifabutin
- Uveitis
- Hepatitis
- Arthritis
- Fever
- Thrombocytopenia
- Leukopenia
- Nausea and vomiting

Tin Man c/o diminished peripheral sensation/paresthesia

Meds: INH*, ethionamide, fluoroquinolones, linezolid, EMB, cycloserine, injectables

Plan of care: Notify provider, increase B6, potential need to stop INH.

* Denotes most likely cause
The Wicked Witch of the West
c/o of a severe rash or skin discoloration

Meds: clofazimine, cycloserine, linezolid, EMB, streptomycin, Any medication!

Plan of Care: Notify provider, stop all meds, wait until improvement. Reintroduce meds one at a time every 2 days and monitor closely.

Alvin c/o changes in hearing and sudden weakness due to hyperkalemia

Meds: Amikacin, capreomycin, kanamycin

Plan of care: Notify provider, audiometry testing, potential renal impairment, may need change in medication and/or regimen.

Sponge Bob c/o visible jaundice, tender RUQ, nausea and vomiting

Meds: INH* (esp. n/v), RIF*, EMB, PZA*, ethionamide, PAS, clofazimine

Plan of care: Notify provider, check LFTs and monitor recovery if elevated. Potential stop medication. Omeprazole for n/v and potentially adjusting meds.

* Denotes most likely cause
When to Stop Medication

- Medication is stopped if:
  - ALT is above 5x upper limit or
  - If patient has symptoms AND ALT is 3x the upper limit
- Measure infectiousness and risk of infecting community
- Recheck in week increments until less than 5x
- Dependent on patient’s personal liver history

Sorcerer Mickey c/o sleep disturbances, seizures, headaches, and behavior changes

**Meds:** INH, ethionamide, fluoroquinolones, terizidone, cycloserine*

**Plan of care:** Notify provider, check dosage, potential stop culprit medication.

* Denotes most likely cause

Iago c/o joint pain and discomfort

**Meds:** PZA*, ofloxacin, levofloxacin, moxifloxacin

**Plan of care:** Notify provider, verify dosage, consider reduction or stop culprit med. Consider Allopurinol.

* Denotes most likely cause
Sneezy c/o flu-like syndrome

Meds: RIF often develops 3-6 months after start

Plan of Care: Notify provider, monitor symptom severity

Genie c/o unexplained bruising and ecchymosis

Meds: Para-Aminosalicylate Sodium (PAS), RIF, cycloserine (anemia), linezolid

Plan of care: Notify provider, initiate regular blood testing and monitor for further symptoms.

Pumbaa c/o diarrhea

Meds: PAS

Plan of care: Notify provider, consider split dose to give smaller doses throughout the day, reduce dose or consider loperamide.
Fred Flintstone c/o goiter and hypothyroidism symptoms

Meds: Ethionamide, PAS

Plan of care: Notify provider, thyroid panel and patient may need thyroxine supplementation due to potential thyroid dysfunction.

The Queen of Hearts c/o heart discomfort/ arrhythmia

Meds: fluoroquinolones and other medication that prolong the QTc

Plan of care: Notify provider, obtain baseline ECG.

Mike Wazowski c/o change in vision

Meds: EMB*, ethionamide, PAS, linezolid

Plan of care: Notify provider at first change, vision testing, B6 with ethionamide, may need to stop EMB.

* Denotes most likely cause
Wile Coyote c/o pain at the injection site

Meds: Amikacin, capreomycin, kanamycin

Plan of care: Consider anesthetic with drug, vary site of injection on daily basis. If severe, consider splitting dose and inject two sites, utilize warm packs.

Role of DOT and Nursing
• Symptom screening
  – Review of systems
  – Monitor weight - key to clinical improvement
  – Documentation
  – Report to managing provider
  – Relationship with patient = success
    ▶ Identify barriers
    ▶ Patient-centered care

Nutrition
• Diet:
  – Protein & fats, good nutrition, nutrition replacement
  – Balanced diet for healing
• Weight Gain:
  – Clinical improvement can be directly correlated with weight gain, even more than can be seen in culture conversion or chest radiograph changes
• Nutrition can be an incentive for adherence
Micronutrients Deficiencies

- **Zinc**: Number of circulating T-cells are reduced
- **Vitamin A**: Lack of functional of epithelial tissues and antibody response
- **Vitamin D**: Causes limited macrophage activity
  - Cholesterol precursor of Vit D and potentially essential to phagocytosis
- **Iron**: Anemia seems to be prevalent among those with pulmonary tuberculosis


Completion of Treatment

- Follow-up chest radiograph?
  - At diagnosis
  - 1-2 months with any change in clinical presentation
  - Questionable chest radiograph at the end of treatment
- Continuing B6?
- Routine liver enzyme panels?

References


Starke, J R. Advanced Concepts in Pediatric TB: Treatment of Tuberculosis Disease, 2/12/2015, Southeastern National Tuberculosis Center Webinar.

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