Mycophenolic Acid Drug Monitoring

Indications for Ordering
Optimize drug therapy and monitor patient adherence

Test Description
Quantitative liquid chromatography-tandem mass spectrometry
- Includes testing for mycophenolic acid and mycophenolic acid glucuronide

Tests to Consider
Mycophenolic Acid and Metabolites 2010359
- Predose (trough) concentration at steady state should be assessed
- Trade names include CellCept, Myfortic

Disease Overview

Clinical issues
- Mycophenolate is an immunosuppressant
- Extensively utilized in organ transplantation regimens
  - Most commonly renal, cardiac, or hepatic transplants
- Also used in treatment of some autoimmune disorders (eg, systemic lupus erythematosus, Crohn disease)

Physiology
- Inhibits inosine monophosphate dehydrogenase
  - Enzyme is crucial for the formation of DNA in cells
  - Blocking of enzyme impairs function of immune system cells
- Major metabolites are mycophenolic acid glucuronide and mycophenolic acid acyl-glucuronide
  - Mycophenolic acid glucuronide – inactive metabolite
    - Concentrations typically 100-250 μg/mL during first two weeks post transplantation
  - Mycophenolic acid acyl-glucuronide – active metabolite

Drug profile
- Long list of drugs that interfere with metabolism of mycophenolate
- Dose adjustments do not appear necessary in severe renal or hepatic disease

Test Interpretation

Analytical sensitivity – limit of detection is 0.5 μg/mL

Results
- Concentration is reported
- Suggested therapeutic range
  - Mycophenolic acid
    - 2 g/day dose – 1.0-3.5 μg/mL
    - 3g/day dose – may have up to 5.0 μg/mL concentration
  - 2.0-4.0 μg/mL range is suggested for maximal efficacy with minimal toxicity
  - Mycophenolic acid glucuronide – 35.0-100.0 μg/mL
- Toxic range
  - Mycophenolic acid – >25.0 μg/mL

Limitations
Toxic and therapeutic ranges are not well established for metabolites