About PK Deficiency

**OVERVIEW**
PK deficiency is a lifelong, chronic disease characterized by hereditary hemolytic anemia, which results from a deficiency of the enzyme pyruvate kinase (PK).

- Patient presentation is highly variable, ranging from mild to life-threatening, with severe debilitating co-morbidities.\(^1\)\(^2\)

PK deficiency is the most common cause of hereditary nonspherocytic hemolytic anemia,\(^1\) yet may be underrecognized, particularly in adults and patients on the milder end of the spectrum of disease severity.\(^2\)

**PATIENT IDENTIFICATION**
PK deficiency should be considered in patients with hemolysis and no findings suggestive of an acquired autoimmune process, red cell membrane defect, or hemoglobinopathy.\(^3\)

Findings among PK-deficient patients may include:
- Anemia
- Fatigue
- Jaundice
  - Splenomegaly
  - Gallstones
  - Iron overload

**TREATMENT/MANAGEMENT**
Current treatment is supportive and not disease-specific, and can include:
- Transfusion therapy
- Splenectomy
- Gall bladder removal (cholecystectomy)
- Iron chelation

**Quick Facts**
- Pyruvate kinase (PK) is a critical enzyme for maintaining red blood cell energy levels
- PK deficiency leads to decreased ATP and a shortened red cell lifespan
- Can be under- and misdiagnosed
ILLUMINATING PK DEFICIENCY

**DIAGNOSIS**
Enzyme assay (simple blood test) for pyruvate kinase activity should be conducted when PK deficiency is suspected.

**Clinical Presentation**
- Anemia
- Dyspnea
- Exercise intolerance
- Abdominal pain
- Iron overload
- Fatigue/weakness
- Jaundice
- Splenomegaly
- Gallstones

**Laboratory Findings**
- **Typically Decreased:** Hemoglobin/hematocrit, pyruvate kinase (PK) activity, haptoglobin
- **Typically Elevated:** Reticulocytes, platelets, bilirubin, MCV, ferritin

**Differential Diagnosis**
- Paroxysmal nocturnal hemoglobinuria
- Glucose-6-phosphate dehydrogenase deficiency
- Hereditary spherocytosis
- Autoimmune hemolytic anemia
- Beta thalassemias
- Hereditary elliptocytosis

**TEST FOR PK DEFICIENCY**

**PATIENT IMPACT**
- Patient presentation ranges from mild to life-threatening\(^1\)^\(^2\)
- Patients on the milder end of the spectrum may go years without a diagnosis\(^2\)
- Fatigue, lethargy, and weakness may have a large impact on daily activity and quality of life

**ONGOING STUDY OPPORTUNITIES**
- A natural history study (clinicaltrials.gov, NCT02053480) designed to understand the range and incidence of symptoms, treatments, and complications related to PK deficiency
- A clinical trial investigating disease-specific treatment for adults with PK deficiency (clinicaltrials.gov, NCT02476916); identified patients should be referred to participating sites

Proper patient identification and diagnosis are taking on new importance.

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