

8. Non-Hepatitis Infections, Nutrition and Dentition

Principles

- To screen for and treat non-hepatitis infections in patients with TDT
- To screen for and manage nutritional deficiencies in patients with TDT
- To recognize patients with TDT may require for dental and orthodontic interventions

Recommendation

- Physicians should be aware that patients with TDT or iron overload are at higher risk for certain infections as compared to the general population.
- Patients with TDT should be regularly assessed for nutritional deficiencies by a multi-disciplinary team, ideally including an assessment by a dietician.
- Patients with TDT may have facial bone deformities, and should be offered dental and orthodontic consultation to improve and maintain functional dentition.

Background

I. Infections

Patients with TDT have increased susceptibility to infections for multiple reasons. There are reported decreases in both innate and adaptive immunity in thalassemia patients⁴⁵⁹. Further many patients with TDT have undergone splenectomy, increasing their risk of infection from encapsulated organisms (*S. pneumoniae*, *H. influenzae*, and *N. meningitides*). Additionally, certain bacterial organisms, *Yersinia enterocolitica*, *Klebsiella* species, *E. coli*, *S. pneumoniae*, *Pseudomonas*, *Listeria*, and *Legionella*) are more virulent in the presence of excess iron⁴⁶⁰. Parvo B19 can cause transient marrow aplasia, and may result in increased transfusion requirements for patients with TDT⁴⁶³. Parvo B19 is typically transmitted through respiratory transmission, however, it can be transmitted through blood products. Pregnant patients with thalassemia are at increased risk of CMV and varicella infections. Patients should be aware that there may be emerging pathogens in the future may be discovered to be transmitted through blood products.

II. Nutrition

Patients with TDT are known to have inadequate nutritional intake of many vitamins and nutrients. Studies have shown inadequate levels of fat soluble vitamins including A, D, E and K, as well as low levels of folate, B6, thiamine, calcium, magnesium and zinc⁴⁶⁵. The deficiencies in calcium, magnesium, vitamin D, zinc, vitamin K have been associated with decreased bone health. There is emerging evidence of amino acid deficiencies (glutamine and arginine) secondary to chronic hemolysis may exist in patients with TDT⁴⁶⁶. The role of essential amino acid supplementation is currently unclear.

III. Dentition

Patients with TDT who are not transfused, under-transfused, or initiate transfusions later in life may have craniofacial bone malformations which can affect dentition and cause malocclusion⁴⁶².

Infections

- Physicians should know that TDT patients are at risk for infections, specifically parvovirus B19, *Yersinia enterocolitica* and *Klebsiella*.
- Patients undergoing splenectomy should have the appropriate vaccines, as per the National Advisory Committee on Immunization, prior to splenectomy.
- Splenectomized patients should have appropriate fever counseling.
- Patients with TDT should have annual screening for blood borne pathogens.
- Patients should be aware there may be emerging pathogens in the future that are currently not known.
- Patients who develop parvo B19 may require a transient increase in transfusion support.

Nutrition

- Physicians should recognize patients with TDT are at high risk for nutritional deficiencies, and regular nutritional assessments should be done by a multidisciplinary team, ideally including a dietitian assessment.
- Patients with TDT should be treated for any deficiencies with appropriate nutritional supplements, including nutrients key to bone health such as calcium, magnesium, zinc, vitamin D and vitamin K⁴⁶⁴.

Dentition

- Patients with TDT should be transfused to minimize bone malformations.
- Patients with TDT should be referred for regular dental assessments and orthodontic assessments when required.