

WHAT IS YOUR DIAGNOSIS?

Easy Bruising, Low Platelets, Recent Coldlike Illness

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A 6-year-old girl was brought to the emergency department (ED) by her mother after the child bumped her head while playing. While the physician examined the child's head, the mother remarked that her daughter had recently developed bruises that appeared suddenly and only after minor, if any, known trauma. The ED physician determined that the child's bump to the head was nothing to worry about, attributed the bruising to the child being a "healthy, active 6-year-old," and sent her home.

Two days later, the child was brought to our office because the mother was still concerned about her daughter's easy bruising. The mother pointed out ecchymosis scattered across her daughter's extremities and torso. The child denied any pain or other complaints, including any active or recurrent bleeding. Upon further questioning, the mother mentioned that her daughter had recovered from a coldlike illness several weeks earlier.

THE DIAGNOSIS

We ordered a complete blood count (CBC) and peripheral smear, which were normal except for the platelet count, which was 7,000/ μ L (normal, 150,000-450,000/ μ L). Based on the child's easy bruising and isolated thrombocytopenia, we diagnosed immune thrombocytopenia, which is also known as *idiopathic thrombocytopenic purpura* (ITP).

DISCUSSION

In ITP, autoantibodies are directed against platelets, leading to their sequestration and destruction in the spleen and a resultant drop in platelet count.¹ Children with ITP typically present between the ages of 2 and 10, with a peak incidence between 2 and 5.² The incidence is estimated to be as high as 8 per 100,000 children.³ However, this estimate primarily reflects symptomatic children, and the true incidence of childhood ITP may be much higher because asymptomatic children may not be brought in to see a doctor.

For the majority of patients, ITP resolves within three months. However, for 20% to 30% of patients, thrombocytopenia will last

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TABLE
ITP Treatment Options

Treatment	Response rate	Adverse effects
IV Rho(D) 50-75 $\mu\text{g}/\text{kg}$	50%-77% of patients achieve a platelet response, depending on dose	Headache, fever, chills (less common than with IVIg)
IVIg 800 mg/kg on Day 1	Effective in > 80% of patients	Headache (which can be severe), fever
Prednisone 1-2 mg/kg/d for a maximum of 14 d, or 4 mg/kg/d for 3-4 d	Up to 75% of patients will respond, depending on dose	Transient mood changes, gastritis, and weight gain; exercise caution in active infection
Watch and wait (with activity restriction)	Approximately 66% of ITP patients will improve spontaneously within 6 mo	Hemorrhage (preventable), anxiety

Source: Provan et al. Blood. 2010.⁹

beyond six months, with or without treatment.⁴ In 1% of cases, patients will have a recurrence of ITP.³

In addition to easy bruising, nearly all patients who present with possible ITP will complain of cutaneous bleeding, typically a nose bleed or bleeding in the oral cavity.² Upon questioning, 60% of patients will report a history of recent infection.⁴ Not surprisingly, bleeding severity correlates inversely with platelet count; severe bleeding is seen in patients with a platelet count < 10,000/ μL .

While rare, the more worrisome complications include intracranial hemorrhage (incidence, 0.1% to 0.8%) and other serious hemorrhages that would require transfusion (estimated incidence, 2.9%).²

Vast differential seen in child bruising

When a child presents with bruising, perform a thorough history, including birth and prenatal course, as well as a physical to exclude other potential causes, such as physical abuse, use of herbal remedies or other natural supplements that may not be disclosed as medication, or even environmental exposure. When bruising is present in a child who has isolated thrombocytopenia, the diagnosis of ITP may be straightforward. However, many conditions share thrombocytopenia in their disease process and should be considered in the differential diagnosis of a child who you suspect may have ITP.

- **Suspect physical abuse** in a bruised child who does not have thrombocytopenia, whose mood is flat or depressed, or who has experienced recurrent injuries or bruising.

- **Leukemia**, particularly acute lymphoblastic

leukemia (ALL), the predominant leukemia found in children, should be ruled out as well. Symptoms that may distinguish a child with ALL from one with ITP include fever, weight loss, and joint pain, as well as signs such as lymphadenopathy, hepatosplenomegaly, anemia, and leukocytosis. A peripheral smear may be ordered to help confirm or exclude a diagnosis of ALL, should any of the above be present in a child with thrombocytopenia.⁵ It may show lymphoblasts and/or atypical cells in a patient with ALL.⁵

- **Infections** should also be included in a differential when a patient is suspected of having ITP, particularly if he or she has systemic symptoms. Viral infections that may cause thrombocytopenia include mononucleosis, dengue virus, human herpesvirus-6, and HIV.^{6,7}

ITP often follows an infection, and the incidence of ITP may be higher during winter months, when infections are more common. However, infection may not always be the cause of ITP. Sepsis may also lead to thrombocytopenia, but a child with sepsis would present very differently from one who has only ITP. A septic child would present with acute illness and signs and symptoms of severe systemic illness, such as high fever, altered mental status, tachycardia, pallor, diaphoresis, and hypotension.

- **Drug-induced thrombocytopenia (DIT)** should be considered in any child who is taking or recently took a medication that may cause thrombocytopenia. Medications that can cause thrombocytopenia include heparin, quinine, vancomycin, trimethoprim-sulfamethoxazole, rifampin, carbamazepine, phenytoin, piperacillin, linezolid, and val-

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proic acid.⁸ The measles, mumps, and rubella vaccine also can cause thrombocytopenia.⁸ A careful medication history may determine if the child is at risk for DIT.

- **To narrow the differential**, obtain a CBC and peripheral smear when evaluating a patient you suspect may have ITP⁵ (strength of recommendation [SOR]: A). A CBC will determine the patient's platelet count, and a peripheral smear should be obtained to exclude other possible diagnoses.⁵

If there are any questions regarding the results of a peripheral smear, it may be necessary to perform a bone marrow aspiration. This, however, is not usually necessary in an otherwise typical case of ITP.⁹ Bone marrow aspiration may, however, be necessary to reevaluate the initial diagnosis for a child who does not respond to treatment for ITP.

Corticosteroids, IVIg are usually effective

The first step in treating a patient with ITP is to limit the risk for further injury or bleeding by stopping NSAIDs or ending participation in contact sports^{2,9} (SOR: C). The next step is to determine if pharmacologic therapy is warranted.

Medication, if necessary, is the mainstay of treatment for patients with ITP, particularly those experiencing significant bleeding.² Corticosteroids, intravenous (IV) immunoglobulin (IVIg), and IV Rho(D) immune globulin (also known as *anti-D*) are the medications typically used to treat a child with ITP, depending on availability of the drugs, bleeding or bleeding risk, and convenience of dosing. For example, corticosteroids can be used orally or IV, whereas IVIg and IV Rho(D) may not be readily available in some treatment settings.

Corticosteroids have been shown to more rapidly increase platelet count compared to placebo and appear to have a dose-related effect.^{10,11} Oral prednisone can be dosed at 1 to 2 mg/kg/d for 14 days and then tapered over the course of one week^{10,11} or one may prescribe 4 mg/kg/d for four days.^{10,11} IV methylprednisolone typically is given at 30 mg/kg/d for three to four days.⁹

IVIg may have greater efficacy than corticosteroids in treating ITP, but it may also cause adverse effects, including nausea, headache, and fever. IVIg can be administered as a single 800 to 1,000 mg/kg dose, or as a daily 400 mg/kg dose for five days; higher doses should be reserved for patients with severe bleeding.¹²

If ITP persists despite the use of corticosteroids or IVIg, IV Rho(D) Ig may be used in patients with

Rho(D)-positive blood at a single dose of 25 to 50 μ g/kg, with additional doses administered on separate days as required to elevate platelet count. However, only Rho(D)-positive patients are eligible for anti-D treatment.

The response rates/times and adverse effects of common treatments for ITP are summarized in the Table (page 41).⁹ A small randomized study found that oral methylprednisolone 30 mg/kg/d for three days followed by 20 mg/kg/d for an additional four days was comparable to IVIg 0.4 g/kg/d for five days.¹¹ A different study that compared oral methylprednisolone (30 mg/kg/d or 50 mg/kg/d for seven days) and IVIg (0.5 g/kg/d for five days) found no difference in outcomes among the three treatments.¹³ One advantage, though, of IVIg is that it can be administered as a single IV dose, rather than multiple doses over several weeks, as is the case with oral prednisone.^{9,11-13}

- **Follow platelet counts closely.** Patients with ITP should have their platelet counts monitored at least once weekly and as often as twice weekly. The frequency of monitoring may be tapered depending on an individual patient's response to treatment and the severity of the thrombocytopenia.¹⁴

- **We referred our patient** to a nearby children's hospital, where a repeat CBC showed her platelets had decreased to 3,000/ μ L. She received a six-hour infusion of IVIg and was discharged with instructions to have her CBC closely monitored. Her platelets remained stable until four weeks later, when they decreased from 102,000/ μ L to 71,000/ μ L. She received a second infusion of IVIg as an outpatient.

Soon after, she presented to our ED with a headache, nausea, and fever of 102°F. CT of her head was normal; a repeat CBC showed no elevation in white blood cells, but her hemoglobin had decreased from 11.9 g/dL to 9.7 g/dL. (Her platelets were 254,000/ μ L.) The patient's complaints were likely adverse effects of the IVIg. The CBC abnormalities, fever, headache, and malaise resolved shortly thereafter, and the patient remains asymptomatic with no recurrence of ITP.

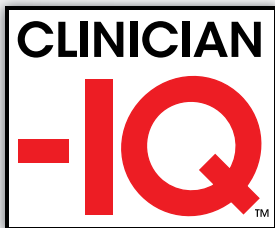
THE TAKEAWAY

Suspect ITP in a child who bruises easily and who also has thrombocytopenia. Order a CBC and peripheral blood smear to rule out other potential illnesses. Pharmacotherapy, if needed, typically consists of an oral or IV corticosteroid or IVIg; IV Rho(D) Ig may be used in Rho(D)-positive patients who don't respond to other treatments. Patients with ITP should have

their platelet count monitored at least once weekly until platelets have increased to 150,000/ μ L or higher. Frequency of monitoring may be reduced as the clinical picture improves and the patient remains stable. More frequent monitoring may be necessary based on severity, complications, and response to treatment. **CR**

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