

PediaNews

The Official Newsletter of the Student Society of Pediatric Advocates (RxPups)

LICense to Kill

Written by: Kirty Patel, Pharm.D. Candidate 2020

It is a dreadful feeling of anxiety when any parent, teacher, or other caregiver discovers lice in a child's hair. They begin to look back on the past few days and realize that the child has been scratching their head frequently, which is a common sign of head lice. The itching is caused by an allergic reaction to louse saliva. The caregiver may wonder why they didn't previously notice the symptoms but know they can contact their local pharmacist with questions, concerns, and guidance for the treatment process.

Upon obtaining the phone call, the pharmacist wants to confirm that the child does in fact have lice. The pharmacist explains to the caregiver that although lice are small, they can be detected by the naked eye. The best way to detect a child's current state of infestation is to examine their scalp for nits (lice eggs) using a magnifying lens and a toothpick comb. Empty nits are lighter in color and further from the scalp, but do not necessarily indicate an active infiltration of lice.¹ It is also important to be aware that nits can be misidentified as dandruff, hair spray residue, or even dirt particles that have lodged into the patient's scalp.

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LICense to Kill (Cont.)

Once a caregiver confirms the presence of lice, the treatment process may begin. Treating head lice requires an over-the-counter or prescription medication. Most products come as either a shampoo, cream, or topical lotion that is applied to the affected area and left on for a period of time. The two types of chemicals that are commonly used in over-the-counter products include pyrethrin and permethrin.² Table 1 further compares the most common lice treatments. Pyrethrin is approved for the use of children over the age of 2, while permethrin is approved for the use of patients as young as 2 months old.² These ingredients are included in several FDA approved medications such as Rid and Nix. Prescription-only medications also include other chemicals such as benzyl alcohol lotion 5% and malathion lotion 0.5%.⁴ The choice of treatment depends on the preferences of the

patient/parent and on the treatment history. In addition to treating the patient, it is important to treat the environment that may be affected in order to diminish the chance of any further infestations from occurring. Some measures that can be taken are to wash clothes and bedding in boiling hot water, seal toys in a plastic bag for at least 2 weeks, and thoroughly vacuum the floors and upholstery.² Indirect transmission can occur where lice can be spread through sharing hairbrushes, hats, headphones, or pillows.⁴ Elementary and preschool students have the highest risk of contracting head lice because the students tend to play closely together and share items that touch their heads.³ Therefore, it is good to be aware and cautious of the signs and symptoms of head lice in pediatric patients.

Head Lice Formulations						
Agent	Brand Name	Generic available?	RX or OTC?	Age	Formulations	Retail Cost ^a
Permethrin 1%	Nix	No	OTC	2 months and older	60 mL crème rinse	\$8.69
					120 mL crème rinse	\$13.98
					Complete lice kit ^b	\$13.82
Pyrethrins 0.33%/ piperonyl butoxide 4%	Rid	No	OTC	2 years and older	60 mL shampoo	\$6.02
					120 mL shampoo	\$9.04
					Complete lice kit ^c	\$15.15
Malathion 0.5% ^d	Ovide	Yes	RX	6 years and older	59 mL lotion	Generic: \$145.86 Brand: \$154.12
Benzyl Alcohol 5%	Ulesfia	No	RX	6 months and older	227-g lotion	\$50.54

^aBased on pricing from Cardinal Health

^bIncludes Nix crème rinse, Nix premium metal 2-sided comb, disposable gloves, hair salon cape, and drop cloth

^cIncludes Rid shampoo, lice and egg comb, comb-out gel, and home lice control spray

LICense to Kill References:

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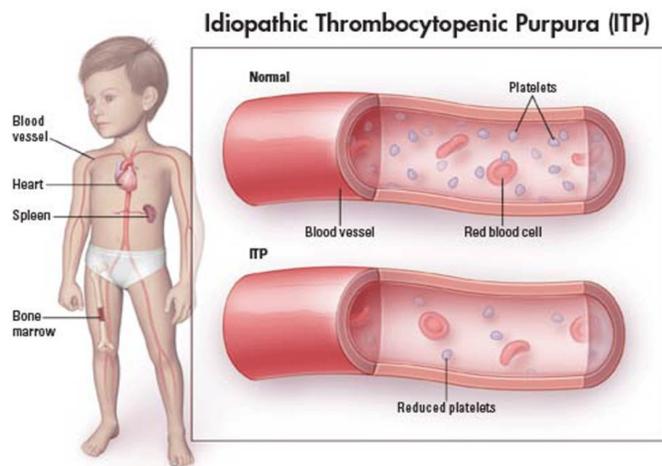
Pediatric Idiopathic Thrombocytopenia Purpura

Written by: Brooke Cottle, Pharm.D. Candidate 2021

Idiopathic thrombocytopenia purpura (ITP) is the most common cause of bleeding disorders in children. ITP is a hematological disorder in which the immune system destroys platelets through the production of autoantibodies. Platelets help blood clot by clumping together to plug areas of damage. ITP is associated with a platelet count lower than 100,000 platelets/ μL (normal platelets count 150,000-450,000 platelets/ μL) in the absence of a known cause. There is no definitive test to diagnose ITP, mostly due to the fact that the cause of ITP is unknown.^{3,4} Known causes of other types of thrombocytopenia include "malignancy, bone marrow aplasia, hepatopathy and/or hypersplenism, disseminated intravascular coagulation or thrombotic thrombocytopenic purpura, alloimmune, genetic or drug-related thrombocytopenia, and pseudothrombocytopenia, infection by human immunodeficiency virus, common variable immunodeficiency, autoimmune lymphoproliferative syndrome or macrophage activation syndrome."⁵

Acute cases of ITP are more common in pediatric patients, whereas chronic cases are more common in adults.¹ Acute and chronic ITP are defined by the duration of the disease. The distinction between acute and chronic ITP occur at 6 months after the onset of the disease. Thrombocytopenia which completely resolves in < 6 months of onset indicates a diagnosis of acute ITP. Thrombocytopenia that is persistent for > 6 months indicates a diagnosis of chronic ITP. Often times, acute

(short-term) ITP occurs after recovery from a recent viral infection (Epstein-Bar Virus, cytomegalovirus, HIV, rubella, and hepatitis A, B, C, etc.). These infections may "trigger" the immune reaction that leads to ITP.



<http://healthlifemedia.com/healthy/wp-content/uploads/2014/10/8/Idiopathic-Thrombocytopenic->

It is important for parents, pharmacists, and physicians to recognize the signs and symptoms of ITP. Symptoms potentially experienced by patients with ITP include: nosebleeds, bleeding from the gums, and blood in the urine or stool, fatigue, any type of prolonged bleeding (internal or external), bruising, purpura (purplish areas on the skin or mouth), petechia (pinpoint red spots often in groups on the skin), or the presence of hematomas (bleeding under the skin that has collected and clotted or partially clotted).^{5,7}



Pediatric Idiopathic Thrombocytopenia Purpura (Cont.)

The amount and severity of symptoms experienced by a person with ITP is often correlated to their platelet count; however, not all patients with ITP experience symptoms. Bleeding may occur with trauma at a platelet count of approximately 50,000 platelets/ μL . Patients with a platelet count of less than 20,000 platelets/ μL are at risk for spontaneous bleed.^{3,7}

There are a limited number of clinical trials in children addressing the treatment of ITP. Most randomized clinical trials conducted in children have focused on platelet counts as the sole outcome measure. Management of low platelets varies widely from observation only to aggressive treatments such as splenectomy. The American Society of Hematology (ASH) and the British Society for Hematology (BSH) have developed treatment guidelines based on expert opinion. ASH and BSH offer two different approaches in treatment. The ASH guidelines suggest therapy based on low platelet count, whereas the BSH guidelines recommends a “wait and watch approach”. Typically ITP can be treated with intravenous immunoglobulin (IVIG), intravenous anti-D rhesus immunoglobulin (IV RhIG), corticosteroids, or splenectomy. Splenectomies are rarely indicated in children except for those with life-threatening bleeding and chronic, severe ITP (platelet count $<10,000$ platelets/ μL).⁵ Pediatric treatment regimens are typically based on the preference of the physician, the amount of restrictions on physical activity of the patient, and the risk of intracranial hemorrhage.⁷

In a recent retrospective review, clinical outcomes of children with persistent/chronic ITP treated with rituximab and dexamethasone were compared. All pediatric patients received 4 weekly doses of rituximab ($375 \text{ mg}/\text{m}^2$ weekly) plus three 4-day pulses of dexamethasone ($28 \text{ mg}/\text{m}^2$ (40 mg max)). The patient population included 33 children ages 1-18 years with persistent/chronic ITP; 19 were female. Every patient had failed at least one previous treatment for ITP. This treatment was generally well tolerated by the population. Of the initial responders (average age 12.7 years) to rituximab, 30% maintained response at 60 months. Of the initial female responders, 80% maintained remission at 60 months. In contrast, 4 of 6 male initial responders relapsed in 36 months; the remaining 2 male patients continued with remission at 60 months. There is a notably higher rate of long term response in female patients undergoing or having completed puberty compared to younger female patients and all male patients. This suggests hormonal changes occurring in women during puberty may alter the autoimmune response and make it more responsive to treatment with 4R+3Dex. This study provides insight to which specific patient population is optimal for the 4R+3Dex regimen. Sustained ITP remission after 4R+3Dex was seen almost exclusively in female adolescents with <24 months duration of ITP. These results indicate that this combination would be a reasonable treatment for a female with chronic ITP, especially for those females after puberty.



Pediatric Idiopathic Thrombocytopenia Purpura (Cont.)

Alternate treatment plans should be pursued for male patients and those who do not fit the criteria of this specific subpopulation identified in this study.²

There is an apparent need for clinical studies in pediatric patients with ITP; however this is difficult to do because of the age and the risk factors associated with new, unstudied drugs. The knowledge gained from multi-centered studies, such as the studies that were previously mentioned, can drastically change the standard of treatment for pediatric cases of ITP.

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Obesity in Children

Written by: Hye Lim Jung , Pharm.D. Candidate 2021

Obesity in children is an ongoing challenge in the United States due to its risks on health outcomes. According to the Center for Disease Control and Prevention, about 17% of children and adolescents of the ages of 2-19 years old are obese. Childhood obesity leads to multiple chronic health conditions such as diabetes, hypertension, hypercholesterolemia, and cardiovascular disease. This article discusses risks factors and lifestyle modifications that can improve childhood obesity.¹

Childhood obesity is dangerous because it can lead to both immediate and future health outcomes. Some of the immediate health outcomes include an increase in blood pressure and cholesterol, which can later lead to cardiovascular diseases. Also, obesity can lead to a higher risk of developing glucose intolerance, insulin resistance, and type II diabetes. The respiratory system can also be affected and can lead to conditions such as asthma and sleep apnea. Obesity increases pressure on the muscular system which can cause joint and musculoskeletal discomfort. Other

complications include developing fatty liver disease, gallstones, and gastroesophageal reflux disease. Furthermore, childhood obesity can affect children's mental state; children with obesity are at higher risk of developing anxiety and depression. Future risks of children with obesity include adulthood obesity with complications of type II diabetes, cancer, and cardiovascular diseases. These chronic conditions can be more severe if the person had childhood obesity.¹

Calculating BMI-for-age can determine whether the child falls under the overweight or obese category. Childhood obesity is defined by measuring body mass index (BMI). A BMI of > 85th percentile - 95th percentile is considered overweight. A BMI \geq the 95th percentile is considered obese (Table 1). The Centers for Disease Control and Prevention (CDC) provides a BMI calculator on their website as well as the most commonly used growth charts for measuring and classifying a child's BMI. Factors related to BMI are thickness of skinfold, body fat, bioelectrical impedance and densitometry.¹

Weight Status Category

Underweight: <5 th percentile	Normal or healthy weight: 5 th percentile - <85 th percentile	Overweight: 85 th percentile - <95 th percentile	Obese: >95 th percentile
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Table 1. BMI-for-age weight status¹

Obesity in Children (Cont.)

Type of Physical Activity	Exercises
Moderate- intensity aerobic	Hiking, skateboarding, bicycle riding
Vigorous- intensity aerobic	Jumping ropes, martial arts, running
Muscle strengthening	Games such as tug-of-war, push-ups (modified push-ups for children)
Bone- strengthening	Gymnastics, basketball, volleyball, tennis

Table 2. Examples of Moderate- and Vigorous-Intensity Aerobic Physical Activities and Muscle- and Bone-Strengthening Activities for Children and Adoles-

It is important to know the causes and consequences of childhood obesity to prevent and decrease the rate of childhood obesity. Childhood obesity is caused by different factors including genetic, environmental, and behavioral factors. Some of the environmental factors are child care centers, schools, parenteral eating habits or communities. Behavioral causes contribute largely to childhood obesity. These include consuming high-calorie foods daily and lack of nutrients in foods and beverages consumed. High sedentary activities combined with low physical activities, medications, and a poor sleeping schedule can also affect childhood obesity. Behavioral causes can be improved by parents providing nutrient-rich and lower-calorie foods to their family. Additionally, children can burn calories by increasing physical activities to prevent weight gain.¹ These behavioral changes can prevent type II diabetes and cardiovascular disease.

The 2008 Physical Activity Guidelines for Americans includes physical activity guidelines for children and adolescents. They recommend a minimum of 60 minutes of physical activities daily. Aerobic activity could

be moderate to vigorous-intensity, but at least 3 days of aerobic activities should be vigorous-intensity activities. Muscle-strengthening and bone-strengthening activities should be included at least 3 days of the week. All these recommendations apply to children and adolescents.²

The 2015-2020 Dietary Guidelines for Americans provides healthy eating pattern information. Their first recommendation is to follow a healthy eating pattern across the lifespan.³ This recommendation focuses on healthy choices of foods and beverages, which will result in healthy body weight, ability to meet nutrient requirements, and reduction of chronic conditions. Second, the guidelines highlight the importance of focusing on the variety of nutrient-dense foods that should be consumed with recommended amounts.³ Third, they stress to limit calories from added sugars and saturated fats and reduce sodium intake, and “shift to healthier food and beverage choices,” suggesting the replacement of unhealthy foods with nutrient-dense foods while emphasizing the importance of balancing with cultural or personal preferences.

Obesity in Children (Cont.)

Childhood obesity can cause serious health consequences ranging from chronic diseases states such as diabetes, cardiovascular diseases and asthma to mental health. To prevent childhood obesity, it is important to know what factors can lead to its development. The 2015-2020 Dietary Guidelines for Americans and 2008 Physical Activity Guidelines for Americans provide beneficial behavioral changes that can prevent or improve childhood obesity. Preventing childhood obesity will decrease the health risk in the future, which can also decrease the chance of adulthood obesity.

Obesity in Children References

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Student Society of Pediatric Advocates

The Student Society of Pediatric Advocates is a student organization affiliated with the University of Georgia College of Pharmacy. We are a student group associated with the Pediatric Pharmacy Advocacy Group. The Mission of the SSPA is to bring awareness to the proper use of medication therapy in pediatric populations through various service and education-based initiatives. Service activities center around lending our medication-based knowledge to pediatric patients and their parents in our community. Educational activities are directed toward student members in an effort to safely and effectively extend pharmacy practice to pediatric populations by building relationships with mentors and professionals in the health care community, as well as supplementing didactic coursework with lectures by specialists and our peers. Overall, SSPA advocates for the safety and happiness of young patients while learning and having fun along the way. The purpose of our newsletter is to educate pharmacy students about pediatric pharmacy and advocate for pediatric patients within the University of Georgia College of Pharmacy.

