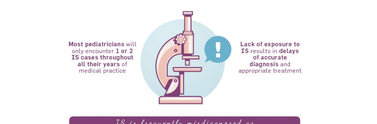
INFANTILE SPASMS

Little Seizures: Big Consequences

Infantile spasms (IS) is a rare seizure disorder occuring in just 1 out of 2000 children under two years of age. Prompt diagnosis and accurate treatment of IS are critical to provide optimal developmental outcomes for these young children.

The Need for Awareness



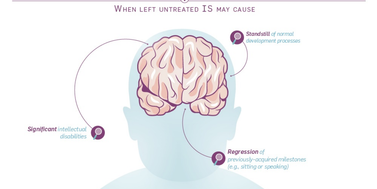
Most pediatricians will only encounter 1 or 2 IS cases throughout all their years of medical practice

Lack of exposure to IS results in delays of accurate diagnosis and appropriate treatment

IS is frequently misdiagnosed as

- Colic
- Normal startle reflex
- Reflux

When left untreated IS may cause



- *Significant* intellectual disabilities
- *Standstill* of normal development processes
- *Regression* of previously-acquired milestones (e.g., sitting or speaking)

Confirm the Infantile Spasms Diagnosis

Electroencephalograms (EEGs) study the electrical activity of brain waves:

An EEG from a **qualified child neurologist** *should be done on every child suspected of having IS*

Required to confirm the diagnosis of infantile spasms is **identifying specific brain-wave patterns** *during and in between spasms*

Most children who have infantile spasms will have an **abnormal electroencephalogram (EEG) pattern** *called* **hypsarrhythmia**

Finding the pattern:

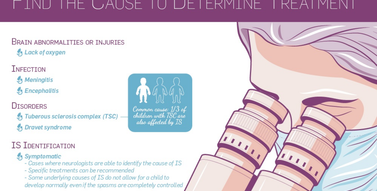
- *Normal EEGs show an* **organized pattern** *of brain waves with clear separation between each electrical signal*
- *Hypsarrhythmia has a very high-voltage,* **disorganized pattern** *of brain waves*
- *Modified hypsarrhythmia is a less chaotic pattern of hypsarrhythmia*
- *Electrodecremental response:* **EEG typically "flattens out"** *for a very brief time*

Found in about 2/3 of IS cases

- *Many patients with IS* **will have all three patterns**

Though causes of IS are countless, 70% of underlying IS causes can be identified with careful evaluation

Find the Cause to Determine Treatment



Brain abnormalities or injuries

- *Lack of oxygen*

Infection

- *Meningitis*
- *Encephalitis*

Disorders

- *Tuberous sclerosis complex (TSC)*
- *Dravet syndrome*

Genetic cause: 1/3 of children with TSC are affected by IS

IS Identification

- **Symptomatic**
  - *Cases where neurologists are able to identify the cause of IS*
  - *Specific treatments can be recommended*
  - *Some underlying causes of IS do not allow for a child to develop normally even if the spasms are completely controlled*
- **Cryptogenic**
  - *Cases of IS where the cause can not be identified*
  - *Treatment that is prompt and successful can allow a child with cryptogenic IS to develop normally*

Treatment of Infantile Spasms: There is Hope!

IS therapy's goal is to achieve complete control of the spasms

- *IS must be diagnosed early and treated accurately*
- *Some children with IS will lead normal lives*

Proper treatment will

- ✓ *Stop seizures*
- ✓ *Eliminate hypsarrhythmia*
- ✓ *Be associated with developmental recovery*

The American Academy of Neurology and Child Neurology Society treatment guidelines specify that successful **treatment** must stop both spasms and hypsarrhythmia

Only 2 **drugs** are approved by the FDA for the treatment of IS

- **Adrenocorticotropic hormone (ACTH)**
- **Vigabatrin**

The decision to treat initially with ACTH or vigabatrin is made by a child neurologist in consultation with the caregiver(s)

Each treatment decision is unique based on each child's presentation of IS

ACTH marketed as Acthar® Gel

Used to treat IS since 1958—Approved by the FDA in 2010

Precise mechanism by which the ACTH hormone acts on IS is unknown. More likely to be effective at higher doses than lower doses. Spasms may return in some children when the medication has been tapered and stopped

Potential side effects

- *Less serious side effects*
  - *Extreme hunger and weight gain*
  - *High irritability*
- *More serious side effects*
  - *High blood pressure*
  - *Decreased glucose levels in the blood*
  - *Stomach ulcer*
  - *Slowed growth*
  - *Heart problems*
  - *Immunosuppression (difficulty fighting infection)*
- *High dose treatment + shortest duration possible = Best chance for controlling the spasms with less risk of serious complications*

Vigabatrin Marketed as Sabril®

Used to treat IS since 1991—approved by the FDA in 2009

Acts by increasing the amount of GABA (an inhibitory brain signaling molecule) in the brain. The 2012 International TSC Consensus Conference recommends vigabatrin as first-line therapy for patients who have IS associated with TSC

Potential side effects

- *Less serious side effects*
  - *Decreased muscle tone*
  - *Sleepiness*
  - *Difficulty sleeping*
- *More serious side effects*
  - *Potential for visual field constriction (tunnel vision)*
  - *Blindness has not been reported and central vision appears to be unaffected*

Additional Treatment Options

Prednisolone at high doses for short durations

- *Alternative to the use of ACTH*
- *Can be given orally whereas ACTH requires daily injections*

Child neurologists may discuss the use of additional treatment options to help manage IS and its effects

- *Vitamin B6 (pyridoxine) or Pyridoxal-5-phosphate*
- *Zonisamide*
- *Clonazepam*
- *Clobazam*
- *Valproic acid*
- *Ketogenic diet (a high-fat, low carbohydrate diet with sufficient protein for growth)*
- *High-dose intravenous immunoglobulin (IVIG)*
- *Surgery to remove an abnormal part of the brain (cortical resection)*

Know What Symptoms to Look for

Children often appear in typical health when born

4-6 months is the average age for onset of symptoms

Each involuntary spasm/seizure **may last 1-2 seconds** but they often appear in clusters that can last several minutes

Children may have several thousand spasms a day

Typical spasms are marked by

- *Interruption of behavior*
- *Forceful drop of the head*
- *Lifting and extension of the arms and legs*
- *Arching the back*
- *Bending forward at the waist*

Some spasms also appear as

- *Subtle forward drops of the head*
- *Subtle eye deviations in a pattern or cluster, especially when lying down*
- *Repetitive forward head nodding or bobbing*
- *Stiffening of the neck, trunk, arms, and legs*
- *Thrusting arms to the side, elbows bent*
- *Crossing arms across body as if self-hugging*
- *Drawing up of knees when lying down*

These movements are followed by a return to the relaxed position—This is a spasm.

Loss of developmental milestones

SENSORY SKILLS
Child can no longer **open their mouth** *for a spoon or imitate familiar things you do*

LANGUAGE AND SOCIAL SKILLS
Babbling, recognizing **a familiar face,** *and laughter deteriorate*

MOTOR SKILLS
Child can no longer **hold head steady while** *sitting with your help, grasp objects, play with toes, shake a rattle, etc*

There is help! There is hope!

Visiting a child neurologist or epileptologist as soon as IS symptoms are discovered is crucial to a child's **diagnosis and treatment**

Resources: There is Help!

Infantile Spasms Awareness Week (ISAW): December 1-7

INFANTILE SPASMS HEROES AWARD
Honors a healthcare professional for embodying the heroic spirit of quality, compassionate, and efficacious care during diagnosis or treatment of IS

INFANTILE SPASMS MINI-GRANTS
Annual initiative that provides $1,000 mini-grants to children living with infantile spasms to subsidize the cost of medical devices and therapies not covered by insurance

COLLABORATIVE INITIATIVE
Sponsored by the Child Neurology Foundation, the Infantile Spasms Community, and the Tuberous Sclerosis Alliance

INFANTILE SPASMS HOPE AWARD
Honors one family in recognition of the courage embodied by families living with IS and their subsequent and compassionate contributions toward helping others through advocacy, awareness, or peer support

Infantile Spasms Community

Infantile Spasms Community is a grassroots movement of caregivers supporting caregivers through an active forum, personal support, and established social media

www.dontmissmyhope.org

Tuberous Sclerosis Alliance

The Tuberous Sclerosis Alliance is dedicated to finding a cure for tuberous sclerosis complex while improving the lives of those affected

www.tuballiance.org

Child Neurology Foundation
Creating a Community of Support

1 in 6 children and their families will face the unsettling effects of a neurologic diagnosis

The Child Neurology Foundation is a national nonprofit organization that connects patients from every area of the child neurology community, so those navigating the journey of disease diagnosis, management, and care have the ongoing support of those dedicated to treatments and cures

To learn more about our network of patients, caregivers, volunteers, advocates, researchers, and clinicians who are **committed to helping your family** along the path that leads to the best quality of care and the highest quality of life for every child, visit www.childneurologyfoundation.org

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