CONDITION

Reye syndrome

Reye syndrome is a sudden condition that causes dangerous swelling in the brain and problems with liver function.

WHAT IT IS
Sudden brain swelling and liver dysfunction

BODY SYSTEM
Liver and nervous system

MAIN SYMPTOMS
Repeated vomiting, extreme sleepiness, confusion, seizures

WHAT CAUSES IT
Unknown mechanism after viral illness, strongly linked to aspirin

HOW IT IS DIAGNOSED
Blood tests, brain imaging, and exclusion of other causes

MAIN TREATMENT
Intensive supportive hospital care

CAN IT BE CURED?
Sometimes - recovery follows successful supportive care

IS IT AN EMERGENCY?
Yes - vomiting with confusion or unusual sleepiness

LONG-TERM OUTLOOK
Often full recovery; severe brain swelling may cause disability or death

Overview

Reye syndrome is a rare but serious condition that affects the brain and liver. It mainly occurs in children and teenagers, although adults can develop it.

The condition often begins during or soon after a viral infection, such as influenza or chickenpox. A child may appear to be recovering and then develop repeated vomiting, unusual sleepiness, confusion, or changes in behaviour.

Reye syndrome causes fat to build up inside liver cells. This prevents the liver from working normally. At the same time, the brain may swell. Brain swelling can quickly affect awareness, breathing, movement, and other essential functions.

The condition has a strong association with aspirin and other medicines containing salicylates

when they are used during viral illnesses in children or teenagers. However, the exact biological process is not fully understood.

Reye syndrome is an emergency rather than a long-term illness. Early hospital treatment can limit brain injury and support the body while the liver and brain recover.

Symptoms

Symptoms can develop quickly, sometimes over several hours. They often begin as a viral illness appears to be improving.

Repeated vomiting is an important early symptom. This is more concerning when it occurs with an unusual change in alertness, behaviour, or breathing.

Possible symptoms include:

Babies and very young children may not have typical vomiting. Early signs can include diarrhoea, rapid breathing, poor feeding, or unusual drowsiness.

Symptoms become more severe as pressure increases inside the skull. A person may become unresponsive, develop abnormal body movements, or have trouble breathing without support.

Jaundice, which is yellowing of the skin or eyes, is not always present even though the liver is affected. Its absence does not rule out Reye syndrome.

- Persistent or repeated vomiting
- Unusual sleepiness or difficulty waking
- Irritability, agitation, or aggressive behaviour
- Confusion or disorientation
- Rapid or deep breathing
- Weakness or loss of energy
- Seizures
- Loss of consciousness

Causes and risk factors

The exact cause of Reye syndrome is unknown. Most cases have followed a viral infection, particularly influenza or chickenpox.

Using aspirin or another salicylate-containing medicine during a viral illness is the best-known

risk factor in children and teenagers. Salicylates are chemicals related to aspirin. They may be present in some pain medicines, cold remedies, stomach medicines, and other products.

Not every child who takes aspirin develops Reye syndrome. Likewise, not every person with suspected Reye syndrome has a known aspirin exposure. The association is strong, but aspirin is not considered the only possible factor.

Some inherited metabolic conditions can cause a similar illness. These conditions affect how the body processes fats, proteins, or energy. A viral infection or a period of poor food intake may reveal one for the first time. Doctors may describe this as a Reye-like illness rather than classic Reye syndrome.

Reye syndrome itself is not contagious. However, the infection that came before it may spread between people.

Diagnosis

There is no single test that proves someone has Reye syndrome. Doctors make the diagnosis from the pattern of symptoms, test results, and the exclusion of other possible causes.

Blood tests may show:

A CT or MRI scan may be used to look for brain swelling and rule out other causes of neurological symptoms. Neurological means relating to the brain, spinal cord, and nerves.

A lumbar puncture may sometimes be needed to check for an infection around the brain, such as meningitis or encephalitis. During this test, a small sample of the fluid surrounding the brain and spinal cord is collected from the lower back. It may be delayed or avoided if brain swelling makes the procedure unsafe.

Testing may also look for poisoning, medication effects, severe infection, and inherited metabolic conditions. A liver biopsy, which removes a very small tissue sample, is rarely needed but may show a characteristic pattern of fat inside liver cells.

Information about recent infections and every medicine or supplement taken is important. Medicine packaging can help the hospital team identify aspirin or another salicylate.

- Raised liver enzymes, suggesting liver cell injury
- High ammonia, a waste product normally processed by the liver
- Low blood sugar
- Changes in blood acidity or body salts
- Poor blood clotting

Treatment and management

Reye syndrome requires immediate treatment in hospital, usually in a paediatric intensive care unit. There is no medicine that directly reverses the condition. Treatment supports the brain, liver, circulation, and breathing while the body recovers.

Care may include:

Doctors may monitor pressure inside the skull when brain swelling is severe. Blood tests are repeated to track liver function, ammonia, blood sugar, clotting, and other changes.

Treatment is adjusted as the condition changes. Careful fluid management is important because both dehydration and excess fluid may create problems.

A suspected medicine should not be given again while the person is being assessed. Do not stop a medicine that was prescribed for a specific condition without medical advice, but tell the hospital team about it immediately.

- Close monitoring of consciousness, breathing, blood pressure, and heart rate
- Fluids and glucose given through a vein
- Careful correction of abnormal body salts or blood acidity
- Treatment to reduce or control brain swelling
- Medicines to control seizures
- Support for abnormal blood clotting or bleeding
- Mechanical breathing support if independent breathing becomes unsafe

Complications

The main threat is swelling of the brain. The skull cannot expand, so rising pressure can reduce blood flow and damage brain tissue.

Other possible complications include:

The liver often has a strong ability to recover. Long-term outcome is usually more closely related to the severity and duration of brain swelling than to lasting liver damage.

- Seizures or prolonged loss of consciousness
- Breathing failure
- Bleeding caused by poor clotting

- Low blood sugar
- Abnormal heart rhythm or blood pressure
- Lasting problems with movement, speech, learning, memory, vision, or hearing
- Death in severe cases

Prevention

Reye syndrome cannot always be prevented because its exact cause is not fully understood. Similar episodes may also result from previously unrecognised metabolic conditions.

The clearest preventive step is to avoid giving aspirin or salicylate-containing medicines to a child or teenager with a viral illness unless a healthcare professional has specifically prescribed them.

Aspirin may be medically necessary for certain conditions, including Kawasaki disease and some heart conditions. In these situations, it is used under specialist supervision. Do not stop prescribed aspirin without contacting the prescribing team.

Check medicine labels for the words aspirin , acetylsalicylic acid , salicylate , or subsalicylate . Ask a pharmacist if you are unsure whether a pain, cold, or stomach medicine contains one of these ingredients.

Vaccination can reduce the chance of infections such as influenza and chickenpox, which have been linked with Reye syndrome. It cannot guarantee that the condition will not occur.

Living with it and what to expect

Reye syndrome is an acute condition, meaning it begins suddenly and is treated over days or weeks. It is not usually an illness that steadily worsens over many years.

Some people recover fully and have no ongoing limitations. Recovery can take time after a serious intensive care admission, even when there is no lasting brain injury. Tiredness, weakness, sleep changes, and emotional distress may continue during the early recovery period.

People who experienced severe brain swelling may have lasting difficulties with memory, concentration, communication, movement, behaviour, or seizures. Rehabilitation can include physical therapy, occupational therapy, speech and language therapy, psychological support, or help with returning to school.

Follow-up may involve neurological checks and assessments of learning or development. Blood tests may be repeated until liver function and clotting return to normal. If the presentation was unusual or there is concern about recurrence, testing for an inherited metabolic condition may continue after discharge.

Reye syndrome does not usually return. However, recurrence is possible, especially if there is an underlying metabolic condition or another exposure to aspirin during a viral illness.

When to get medical help

Seek emergency medical help now if a child or teenager has repeated vomiting together with confusion, unusual behaviour, extreme sleepiness, difficulty waking, rapid breathing, a seizure, or loss of consciousness. This is especially important during or soon after a viral illness.

Do not wait for jaundice or other signs of liver trouble. Reye syndrome can become severe without yellow skin or eyes.

If a seizure occurs, protect the person from nearby hazards and place them on their side when possible. Do not restrain them or put anything in their mouth.

Tell the emergency team about recent infections and all medicines taken, including non-prescription products. Bring the packaging if it is available.

After hospital discharge, routine follow-up is used to monitor liver recovery, neurological health, learning, behaviour, and rehabilitation needs. Contact the follow-up team sooner if recovery seems to reverse or new symptoms develop.

Common questions

Is Reye syndrome contagious?

No. Reye syndrome itself does not spread between people. The viral infection that comes before it, such as influenza or chickenpox, may be contagious.

Does aspirin always cause Reye syndrome?

No. Most children who take aspirin do not develop Reye syndrome. However, aspirin and related salicylates have a strong association with the condition when used during viral illnesses in children and teenagers.

Can adults get Reye syndrome?

Yes, but it mainly affects children and teenagers. Adults with similar symptoms still need urgent assessment because infections, poisoning, liver failure, and metabolic problems can

cause the same warning signs.

Can a child recover completely?

Complete recovery is possible, especially when treatment begins before severe brain swelling develops. The outlook is less favourable when there has been prolonged unconsciousness, severe swelling, or major brain injury.

How soon does it start after a viral infection?

Symptoms usually begin during or soon after the infection, sometimes when the person appears to be getting better. Repeated vomiting followed by sleepiness, confusion, or behavioural change needs emergency assessment.

Can Reye syndrome happen again?

It can, although recurrence is not usual. Doctors may look for an inherited metabolic condition if there is more than one episode or if test results do not fit the usual pattern.

Sources

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