CONDITION

Polycythemia - newborn

Newborn polycythemia means a baby has an unusually high concentration of red blood cells.

WHAT IT IS
Too many red blood cells in a newborn's blood

BODY SYSTEM
Blood and circulation

MAIN SYMPTOMS
Poor feeding, sleepiness, jitteriness, breathing difficulty

WHAT CAUSES IT
Reduced fetal oxygen, placental transfusion, or fluid loss

HOW IT IS DIAGNOSED
Venous hematocrit blood test

MAIN TREATMENT
Monitoring and fluids; sometimes partial exchange transfusion

CAN IT BE CURED?
Yes - usually resolves during the newborn period

IS IT AN EMERGENCY?
Sometimes - seizures, severe breathing trouble, or blue colour

LONG-TERM OUTLOOK
Usually good, shaped mainly by underlying conditions

Overview

Newborn polycythemia means that a baby's blood has an unusually high concentration of red blood cells. Red blood cells carry oxygen around the body.

The main blood measurement is the hematocrit , which is the percentage of blood made up of red blood cells. Newborn polycythemia is commonly defined as a venous hematocrit of 65% or higher. A venous sample comes from a vein rather than a heel-prick sample.

Polycythemia can make blood thicker than usual. This is called hyperviscosity . Thick blood may move less easily through very small blood vessels, which can affect oxygen and nutrient delivery. However, polycythemia and hyperviscosity are not exactly the same: a high hematocrit does not always cause thick-blood symptoms.

Many babies have no symptoms. The condition is usually found during the first hours or days after birth because a baby has symptoms, has certain risk factors, or has a high result from another blood test.

Newborn polycythemia is usually temporary rather than a lifelong blood disorder. It is different from polycythemia in adults, which can have other causes and treatments.

Symptoms

Many newborns with polycythemia appear well. When symptoms occur, they are often general symptoms that can also be caused by infection, low blood sugar, breathing conditions, or other newborn problems.

Possible signs include:

Less commonly, a baby may have pauses in breathing, seizures, reduced urine output, or signs of poor circulation.

A red-looking complexion alone does not confirm polycythemia. Newborn skin colour changes with temperature, circulation, skin tone, and oxygen levels. A blood test is needed for diagnosis.

- Poor feeding, weak sucking, or vomiting
- Unusual sleepiness, low activity, or irritability
- Jitteriness, shakiness, or low muscle tone
- Fast or difficult breathing
- A deep red or ruddy skin colour
- Blue or grey lips or skin
- Low blood sugar
- Jaundice, which causes yellow skin or eyes

Causes and risk factors

Polycythemia can develop when a baby makes extra red blood cells before birth. This often happens in response to receiving less oxygen than usual in the womb. The extra cells help the baby's blood carry more oxygen.

Conditions linked with increased red blood cell production include poor placental function,

growth restriction, pregnancy-related high blood pressure, and going well beyond the expected delivery date. Babies of mothers with diabetes may also be at increased risk. Both babies who are small and those who are large for their gestational age can be affected.

Polycythemia may also occur when extra blood passes to the baby around the time of birth. Examples include unequal blood flow between twins sharing a placenta or, less commonly, other placental transfusion events.

Delayed umbilical cord clamping allows beneficial extra blood to pass from the placenta to a newborn. It can produce a modest increase in hematocrit, but recommended delayed clamping has not consistently been shown to cause clinically important polycythemia in healthy term babies. Parents should not assume that routine delayed clamping caused the condition.

Some chromosome conditions, including Down syndrome, are associated with a higher risk. In other babies, there is no single clear cause.

Fluid loss can concentrate the blood and produce a high hematocrit without a true increase in the total number of red blood cells. This is sometimes called relative polycythemia. Feeding history, weight change, urine output, and repeat test results help the care team tell the difference.

Diagnosis

Polycythemia is confirmed with a blood test measuring the hematocrit. A venous hematocrit of at least 65% is the commonly used definition in newborns.

A heel-prick, or capillary, sample may be used for an initial check. These samples often give a higher reading than blood taken from a vein. A high heel-prick result is therefore usually confirmed with a venous sample before treatment decisions are made.

The assessment also considers whether the baby has symptoms and whether another condition could explain them. A high number by itself does not show how well blood is moving through the baby's tissues.

Other tests may check for related problems, such as:

Not every baby with a risk factor needs the same testing. Hospitals may use different screening approaches, especially for well babies without symptoms.

- Blood glucose for low blood sugar
- Bilirubin for jaundice
- Platelet count and other blood cell measurements

- Oxygen levels and breathing
- Kidney function or other tests when symptoms suggest complications

Treatment and management

Treatment is based on the baby's symptoms, confirmed venous hematocrit, age, hydration, and other health conditions.

A baby who appears well may need observation rather than an invasive treatment. Staff may support feeding, monitor fluid intake and urine output, repeat the hematocrit, and check blood glucose or bilirubin. Some babies need fluids through a vein if feeding is not sufficient or if dehydration is contributing.

Any associated problem is treated as well. This may include management of low blood sugar, jaundice, breathing difficulty, or an underlying newborn condition.

A partial exchange transfusion may be considered when a baby has symptoms that fit polycythemia and a markedly high venous hematocrit. During this procedure, a measured amount of the baby's blood is removed in small stages and replaced with fluid, usually normal saline. This lowers the concentration of red blood cells while keeping the circulating blood volume stable.

Partial exchange transfusion can lower the hematocrit promptly, but it is not automatically helpful for every baby with a high result. Research has not shown a clear long-term developmental benefit for routine treatment of babies who have no symptoms. The procedure also has risks, so a neonatal team weighs its possible benefits and harms for the individual situation.

Parents can ask what symptoms are being linked to the high hematocrit, whether the result came from a vein, and what monitoring is planned.

Complications

Most babies do not develop serious complications. Concerns arise when thick blood reduces flow through small blood vessels or when the condition occurs alongside another newborn problem.

Possible short-term complications include low blood sugar, jaundice, reduced platelet numbers, breathing difficulty, and feeding problems. Jaundice can develop because the body must break down a larger number of red blood cells, producing more bilirubin.

Uncommonly, reduced circulation may affect the brain, intestines, kidneys, lungs, or heart. Seizures, blood clots, and serious intestinal injury are possible but are not typical.

It can be difficult to separate the effects of polycythemia from those of its cause. For example, reduced oxygen before birth or poor fetal growth may affect development independently of the hematocrit. This is one reason long-term outcome cannot be predicted from a single blood result.

Prevention

Newborn polycythemia cannot always be prevented. Many causes develop before birth because of placental function, fetal growth, twin blood flow, or an inherited chromosome condition.

Good management of diabetes and high blood pressure during pregnancy may reduce some related risks, but it cannot guarantee prevention. Regular pregnancy care can help identify growth or placental concerns so that the baby can be assessed after delivery.

Parents should not change plans for umbilical cord clamping solely out of concern about polycythemia. Delayed cord clamping has established newborn benefits, and decisions about timing should reflect the birth circumstances and current maternity guidance.

After birth, early feeding support and attention to hydration can help prevent dehydration from making the blood more concentrated. They do not prevent polycythemia caused by extra red blood cell production.

Living with it and what to expect

Newborn polycythemia is generally a short-term condition. Hematocrit is naturally high soon after birth and then falls as the baby's circulation and fluid balance adjust.

A well baby may only need monitoring for a day or two. If symptoms, low blood sugar, or feeding problems occur, observation may last longer. Babies treated with a partial exchange transfusion usually have repeat assessments to check their response and watch for complications.

Jaundice can become more noticeable after leaving the hospital, so follow-up may include a bilirubin check, feeding review, or weight check. Keep any planned newborn appointments even if the baby appears well.

Once the hematocrit has returned to an appropriate level, newborn polycythemia usually does

not become a chronic blood condition. It does not usually require treatment later in childhood.

Long-term development is often normal, particularly when the baby was otherwise well. When there was fetal growth restriction, reduced oxygen before birth, a chromosome condition, or another medical problem, follow-up is guided mainly by that underlying issue. A high hematocrit alone cannot predict how a child will develop.

When to get medical help

If your baby is still in hospital, tell the newborn staff promptly about feeding difficulty, unusual sleepiness, shaking, colour changes, or breathing concerns.

Seek emergency help now if your baby:

Contact your baby's healthcare service the same day if your baby feeds much less than usual, repeatedly vomits, is increasingly sleepy, has fewer wet nappies, becomes jittery, or develops worsening yellow skin or eyes. These signs have several possible causes and need assessment rather than being assumed to come from polycythemia.

Routine follow-up is appropriate when your baby is feeding and breathing normally but has a planned repeat blood test, jaundice check, weight check, or developmental review. Attend these appointments even if there are no new symptoms.

- Has a seizure or becomes unresponsive
- Has severe difficulty breathing or repeated pauses in breathing
- Develops blue or grey lips, tongue, or skin
- Is very floppy or cannot be woken for feeding

Common questions

Is newborn polycythemia the same as adult polycythemia?

No. Newborn polycythemia is usually a temporary adjustment related to pregnancy, placental blood flow, birth, or hydration. Adult polycythemia has a different range of causes and may be a long-term disorder.

Does a high hematocrit mean my baby needs a transfusion?

Not necessarily. The result should usually be confirmed with venous blood, especially if the first sample came from a heel prick. Treatment also considers symptoms, hydration, age, and other test results. Many well babies need monitoring and feeding support only.

Why does my baby look very red?

A high red blood cell concentration can give the skin a ruddy or deep red appearance. However, warmth, crying, normal circulation changes, and skin tone can also affect colour. Appearance alone cannot diagnose polycythemia.

How long does newborn polycythemia last?

It usually improves during the newborn period as the hematocrit falls and fluid balance settles. The exact timing is influenced by the starting level, symptoms, hydration, and underlying cause.

Can polycythemia cause jaundice?

Yes. As extra red blood cells naturally break down, they produce bilirubin, the yellow pigment responsible for jaundice. Some babies therefore need bilirubin monitoring or treatment for jaundice.

Will my baby have blood problems later in life?

Usually not. Newborn polycythemia generally does not become a lifelong blood disorder. Longer-term follow-up may still be needed when it occurred alongside poor fetal growth, reduced oxygen before birth, or another condition.

Sources

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