HOW A DELETION ON CHROMOSOME 20 CAUSES CONGENITAL HYPERINSULINISM

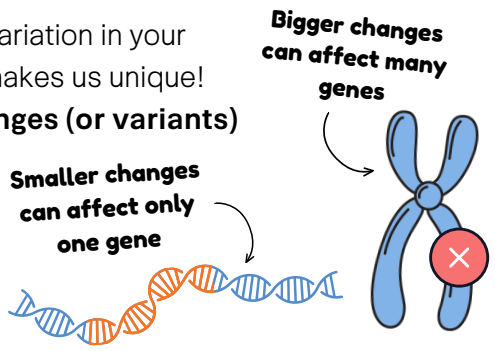
HYPERINSULINISM GENES

This summarises our information sheet on **congenital hyperinsulinism** (shortened to HI) **caused by a deletion on chromosome 20**. Check out the full document here!

WHAT ARE GENES, CHROMOSOMES AND GENETIC VARIATION?

Our **DNA** is our **instruction manual,** and is made up of **genes** that tell our cells what to do. Our DNA is stored in structures called **chromosomes** and we have 46 in each cell, 23 from mum and 23 from dad.

It's normal to have variation in your genes, that's what makes us unique! But sometimes **changes (or variants)** in our genes can **affect how our cells work**, causing **health problems**.



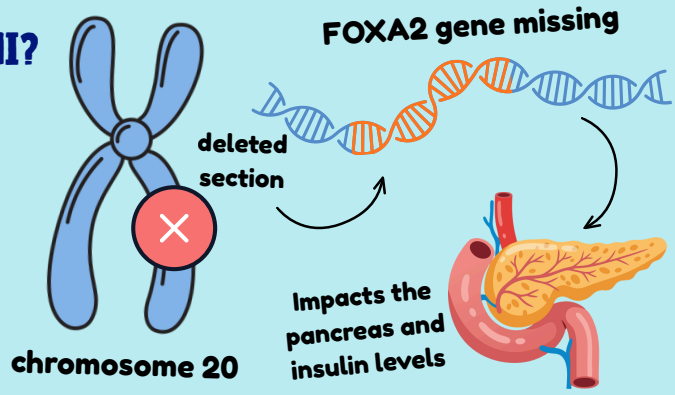
KEY MESSAGES:

- A **deletion in chromosome 20** has been linked to **HI in 5 children**
- Specifically, the deletion of the ***FOXA2*** **gene** is believed to be the cause
- This form of HI is considered **rare**, but may be **underdiagnosed** as it is not routinely tested for
- The standard treatment is **diazoxide**, which resolved or managed the symptoms in 4 out of 5 children
- Because this form of HI has only **recently been discovered**, researchers are now working to **understand more** about the condition and **long-term treatment**

HOW CAN A DELETION ON CHROMOSOME 20 CAUSE HI?

One type of big change is called a **deletion**, where **whole sections of DNA can be lost**.

We have recently discovered that **deletions on chromosome 20** are a **cause of HI**. One gene that is missing is ***FOXA2***. It has many functions and one is to make sure the **pancreas works properly**. As the pancreas is the organ that releases **insulin**, we think that **not having this gene is causing HI**.



IS IT COMMON? HOW IS IT INHERITED?

This form of HI is considered **rare BUT** it may be **underdiagnosed** because it is not included in routine tests.

It is a **dominant variant**, explained further in our information sheet linked here.

In 4 of the children it is a ***de novo*** **variant**, meaning it was **not found in their parents**.

HOW DO YOU TREAT AND MANAGE IT?

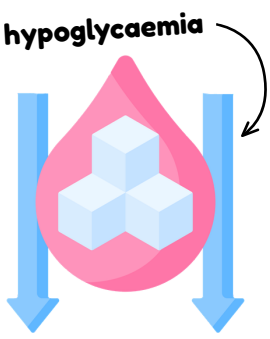
4 of the 5 children were given the drug **diazoxide**. This is the **standard treatment for HI.**

For one of them, the **HI resolved when they were 6 months** old. The other 3 children are **continuing to take diazoxide** to manage their HI.

In the fifth child, the **diazoxide treatment was not able to control their blood glucose levels**, so they underwent **surgery** that **took out some of their pancreas** to help manage their HI.

Because this form of HI has **only recently been discovered**, researchers are working hard to understand which **treatments** will work best in the **long term**.

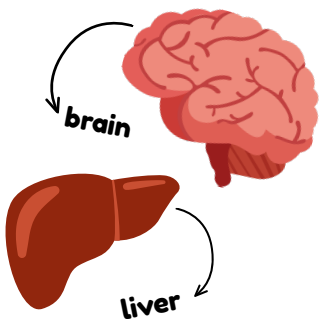
WHAT ARE THE FEATURES OF HI CAUSED BY A CHROMOSOME 20 DELETION?



All 5 of the children have **low blood sugar levels** (known as **hypoglycaemia**) that was diagnosed before they were 1 year old.

We also know the ***FOXA2*** gene has an important role in **the brain and the liver**. This could explain why some children **developed other conditions**.

The other features reported are:



- Distinctive **facial features**
- **Learning difficulties**, including slower than expected development of movement skills (e.g. sitting, walking, and coordination)
- Difficulties with **feeding** and/or **slower growth**
- Changes in the **level of hormones** from the **pituitary gland** in the brain
- Issues with the **heart, kidneys, and genitals (in males)** which could be treated and managed. In some children, these features **got better with time.**

It is important to note that these **features vary between individuals** and likely reflects the **differences in the size of the deletion each person has.**