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## Hormonal imbalances after brain injury

### Introduction

Brain injury may cause damage to the **hypothalamus** and/or **pituitary gland**, which are small structures at the base of the brain responsible for regulating the body's hormones. Damage to these areas can lead to insufficient or increased release of one or more hormones, which causes disruption of the body's ability to maintain a stable internal environment (**homeostasis**). If damage to the pituitary gland leads to a reduction in hormone production the resulting condition is known as **hypopituitarism**.

### Symptoms and assessment

In the early stages after brain injury most people's hormone levels are severely affected, making diagnosis of hypopituitarism difficult. Later in the recovery process it may become clear that some symptoms are caused by hormonal changes and some rehabilitation units test for this on assessment. However, there are currently no clear guidelines in place for the assessment and treatment of pituitary function after brain injury and more research is needed to determine the scale of the problem.

The effects of pituitary and hypothalamus injury are many and varied because of the huge amount of hormones which can be affected. Some symptoms are similar to the more common effects of brain injury and that is another reason why the problem may be under-diagnosed.

### Examples of overlapping symptoms are:

- Depression
- Sexual difficulties, such as impotence and altered sex drive
- Mood swings
- Fatigue
- Headaches
- Vision disturbance

### Other symptoms include:

- Muscle weakness
- Reduced body hair
- Irregular periods / loss of normal menstrual function
- Reduced fertility
- Weight gain
- Increased sensitivity to cold
- Constipation



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- Dry skin
- Pale appearance
- Low blood pressure / dizziness
- Diabetes insipidus

Each symptom is caused by a change in the level of a particular hormone that is produced by the pituitary gland. There are many possible causes of the above symptoms, particularly after brain injury, so a thorough assessment is required before any diagnosis can be made.

If you suspect you or a relative may be experiencing the symptoms of hypopituitarism, or any other hormonal condition, you should speak to your GP. If they feel it is appropriate, they will be able to refer you for further assessment with a specialist in the field, such as an endocrinologist.. They will be able to run a variety of hormone level tests and may refer you for a scan to look for signs of damage to the hypothalamus or pituitary gland.

It is important to remember that symptoms may not become apparent immediately. In some cases the problems don't manifest themselves until weeks, months or even years later. Don't dismiss the possibility that the problems are a result of the head injury just because it happened a long time ago.

## Treatment

In the early stages, hormonal problems can cause a condition called **neurogenic diabetes insipidus**, which is characterised by increased thirst and excessive production of dilute urine. This is due to a reduction in secretion of a hormone called vasopressin (anti-diuretic hormone) and can be treated by administering desmopressin (manufactured anti-diuretic hormone) and replacing lost fluids. In most cases diabetes insipidus disappears fairly quickly, but in some rare instances can persist, sometimes permanently, requiring lifelong hormone replacement therapy.

In the later stages, where hypopituitarism is confirmed, treatment may be given. Hormone replacement therapy may be used to restore hormones to normal levels, which should help to manage the symptoms. There are different treatments available, depending on the particular hormones involved and the nature and extent of the symptoms.

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The assessment and treatment of hypopituitarism after brain injury is a complex process and more research is needed into the potential long-term benefits of hormone replacement therapy. As with any treatment, you should discuss the pros and cons with your doctor before making any decisions.

## Further information

There are a number of studies into hypopituitarism after brain injury, but as yet the full extent of the problem is unknown. It seems to occur mainly after severe brain injury, however some studies have shown that the pituitary gland may also be vulnerable to seemingly minor head injuries.

You should be particularly aware that many of the symptoms can be caused by damage elsewhere in the brain, and if this is the case treatment for pituitary dysfunction will not be effective.

**To discuss any issues raised in this factsheet or to find details of our local Groups and Branches, please contact the Headway helpline free of charge on 0808 800 2244 or by email at [helpline@headway.org.uk](mailto:helpline@headway.org.uk). You can also find more information and contact details of Groups and Branches on our website at [www.headway.org.uk](http://www.headway.org.uk).**

**Headway produces a range of booklets and factsheets covering brain injury related issues. Booklets cost £3.50 each and can be ordered from the website or on 0115 924 0800. Factsheets are freely downloadable from the website.**

**Brain injury survivors and carers can receive free copies of appropriate booklets from the helpline.**

*First published 2010. Review date 2012.*

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