Hormonal imbalances after brain injury

This publication is part of Headway's *Effects of brain injury* series. To browse through our publications on a range of issues relating to brain injury and download these free-of-charge, visit www.headway.org.uk/information-library.

Introduction

The brain plays a key role in regulating the body's hormones. Damage to the parts of the brain that control the monitoring and release of hormones can cause a disruption in the body's ability to maintain a stable internal environment. Hormone release can become increased or insufficient, causing a range of physical, psychological or emotional issues.

This publication has been written to offer information about hormonal imbalances after brain injury and where to seek support with such issues. A glossary is provided at the end of the publication to define words in **bold**.

The information in this publication does not replace clinical guidance from medical professionals. You should always seek advice from a GP or other suitably qualified professional for help with managing the effects of brain injury.

What are hormonal imbalances?

The body is responsible for maintaining its internal environment through a process called **homeostasis**. This monitors and regulates basic bodily functions such as energy, temperature, thirst, hunger and sleep/wake cycles, among others, and relies on the activity of hormones.

Small structures at the base of the brain called the **hypothalamus** and the **pituitary gland** are responsible for regulating hormones. Damage to these parts of the brain can therefore cause hormonal imbalances, affecting the body's ability to regulate its internal environment.

If damage to the **pituitary gland** leads to a reduction in hormone production, the

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resulting condition is known as **hypopituitarism**.

Symptoms of hormonal imbalances

In the early days of brain injury, hormone levels are often severely affected, which can make it difficult to diagnose hypopituitarism at this stage. Later on in the recovery process, it may become clear that some of the symptoms are specifically caused by hormonal changes, and some rehabilitation units can test for this on assessment.

The effects of pituitary and hypothalamus injury are many and varied because of the large numbers of different hormones that 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.

Some examples of symptoms that are common to both hormonal imbalance issues and brain injury are:

- Depression
- Sexual difficulties
- Fatigue
- Mood swings
- Headaches
- Vision disturbance

Further information on these issues and others is available in our publications at www.headway.org.uk/information-library.

Symptoms more unique to hormonal imbalances include:

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

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- Pale appearance
- Low blood pressure/dizziness
- **Diabetes insipidus**

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

Assessment of hormonal imbalances

If you suspect someone, either yourself 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.

Endocrinologists are able to run a variety of hormone level tests, and may refer you for a brain scan to look for signs of damage to the hypothalamus or pituitary gland. More information on the different types of scans that are commonly used to diagnose brain injury is available in our publication *Scans and tests after brain injury*.

It is important to remember that symptoms might not be immediately obvious. In some cases, the issues don't appear until weeks or months later. It is therefore important not to dismiss the possibility of hormonal imbalances issues just because a brain injury happened a long time ago. Indeed, research has found that even though the number of brain injury survivors with hormonal imbalance issues reduces over time, even a year on around a third of survivors still had these issues.

Treatment of hormonal imbalances

In the early stages, hormonal problems can cause a specific condition known as **diabetes insipidus** (this is not the same as the condition diabetes), which is characterised by increased thirst and excessive production of dilute urine. This

occurs due to a reduction in the production and secretion of a hormone called vasopressin (an **anti-diuretic** hormone), and can be treated by administering an **anti-diuretic** medication called desmopressin. In most cases, **diabetes insipidus** disappears fairly quickly, but in some rare instances it can persist, sometimes permanently, requiring lifelong hormone replacement therapy.

In the later stages of brain injury, when a diagnosis of **hypopituitarism** can be confirmed, appropriate 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.

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 is also vulnerable to seemingly minor injuries and this could be due to its location within the brain.

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

Further information and guidance on coping with many of the effects of brain injury are available in Headway's publications, available at www.headway.org.uk/information-library.

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Glossary

Anti-diuretic - a substance that helps to control fluids in the body. Anti-diuretic hormones can help to reduce the production of urine in conditions such as diabetes insipidus.

Diabetes insipidus - a condition following damage to the brain causing excessive thirst and dilute urine production.

Endocrinologist - a professional who specialises in hormones and can carry out appropriate tests to investigate, diagnose and treat hormonal imbalances.

Homeostasis - the body's system of monitoring and regulating its internal environment.

Hypopituitarism - a condition following damage to the pituitary gland in the brain resulting in a reduction of hormone production.

Hypothalamus - a small part of the brain responsible for hormonal regulation.

Pituitary gland - a small part of the brain responsible for hormonal regulation.

To discuss any issues in this publication, or to find details of our Headway groups and branches, contact the Headway helpline on 0808 800 2244 (Monday - Friday, 9am-5pm) or helpline@headway.org.uk.

As a charity, we rely on donations from people like you to continue being able to provide free information to those affected by brain injury. To donate, or find out how else you can get involved with supporting our work, visit www.headway.org.uk/get-involved.

If you would like to leave feedback for this publication, please consider completing our short survey at www.surveymonkey.co.uk/r/hwpublications or contact us at publications@headway.org.uk.

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