Post-concussion Syndrome

Concussion is an injury to your brain that can occur after a minor head injury.

Post-concussion syndrome is a collection of symptoms that some people develop after they have had concussion. It is a complication of concussion. Symptoms of post-concussion syndrome can include headache, dizziness and memory and concentration problems. Symptoms usually clear within three months after the initial head injury.

Treatment is aimed at relieving symptoms. Many people find that it helps to have a diagnosis and explanation for their symptoms.

What is concussion?

Concussion is an injury to your brain that may occur after a blow to your head. The blow to your head causes your brain to move slightly within your skull. This can momentarily disrupt the electrical activity within some of the cells in your brain so that your brain stops working properly for a short period of time. It is this disruption that leads to the symptoms of concussion. Concussion is also known as 'minor traumatic brain injury' by doctors.

Classically, someone with concussion has a headache, appears confused and has loss of memory around the time of their head injury. They may also have lost consciousness briefly after the head injury (but not always). Being sick (vomiting) and some temporary disturbance of vision (such as blurry vision or 'seeing stars') can also be symptoms of concussion.

The most common causes of concussion are falls (especially from a height), road traffic accidents and accidents during sports such as rugby, football, boxing and cycling.

Most people with concussion make a full and quick recovery and do not need any treatment. In most cases, concussion does not lead to any long-term problems. However, it is important to note that anyone who has had a head injury, however minor, does need close monitoring for a few days afterwards. This is because what may appear at first to be symptoms of concussion could also be symptoms of a more serious problem such as bleeding around the brain. A separate leaflet called Head Injury Instructions gives more details. It includes important symptoms to look out for after a minor head injury and when to see a doctor.

What is post-concussion syndrome and what are the symptoms?

Post-concussion syndrome is a collection of symptoms that some people develop after they have had concussion. Concussion is a brain injury that may occur after a blow to your head. Post-concussion syndrome is a complication of concussion. It is sometimes called post-concussive syndrome.

The symptoms of post-concussion syndrome can include:

- **Physical symptoms:**
  - Headache. This is the most common symptom.
  - Dizziness. This may be accompanied by dizziness with a spinning sensation (vertigo).
  - A feeling of sickness (nausea).
  - Double, or blurred, vision.
  - Hearing loss and/or a ringing noise in the ears (tinnitus).
  - Reduced sense of smell and taste.
  - Problems tolerating bright light and loud noise.

- **Emotional and behavioural symptoms:**
  - Being easily irritable and sometimes aggressive.
  - Feeling anxious easily.
  - Depression.
  - Having disturbed sleep and feeling tired.
  - Reduced sex drive.
  - Changes in your appetite.
  - Personality changes such as showing socially or sexually inappropriate behaviour.
  - Having a lack of energy and a lack of interest in things.
  - Having sudden outbursts of emotion - for example, sudden crying or laughing episodes.
Problems with mental processes (called cognitive symptoms):
- Difficulty remembering things.
- Concentration and attention problems.
- Slowed reaction times.
- Problems processing information and problems reasoning.
- Difficulty learning new things.

Not everyone with post-concussion syndrome will have all of the symptoms mentioned above.

In general, for most people, symptoms of post-concussion syndrome only last for up to a few weeks. But for some people, the symptoms last longer and can last for three to six months or (rarely) a year or more.

What causes post-concussion syndrome?

The exact reason why some people develop post-concussion syndrome after a blow to the head is not clear. There seems to be no correlation with the severity of the head injury.

A number of different theories have been put forward. One theory is that it is caused by tiny areas of bruising or other damage to the nerve cells in the brain, caused by the initial head injury. Another is that the head injury causes an imbalance of chemicals in the brain that leads to the symptoms.

Some research has shown that there are various risk factors that may make a person more likely to have post-concussion syndrome. These include:
- Being a young male.
- Being more elderly.
- Being homeless.
- Having a history of mental health problems.
- Being a sportsperson.

How common is post-concussion syndrome?

It is difficult to estimate how many people have post-concussion syndrome. Each year around 1 million people attend Accident and Emergency departments in the UK because of a blow to the head. Many more people who have a minor head injury will never seek medical care.

One study showed that between 20 and 50 out of 100 people with a mild head injury had symptoms of post-concussion syndrome three months after the initial injury. About 1 in 10 people still have problems one year after the injury.

How is post-concussion syndrome diagnosed?

If you are worried that you may have symptoms of post-concussion syndrome, you should talk with your doctor.

Your doctor will usually diagnose post-concussion syndrome by your typical symptoms. They may also do a physical examination, paying particular attention to your nervous system to check that there are no signs of any problems. A physical examination of your nervous system includes simple tests of your muscle strength in your arms and legs. It also includes tests of your muscle reflexes, your co-ordination and your sensation. Your doctor may ask you to perform a number of movements of your arms, legs and face, etc. There should be no signs of problems with your nervous system on physical examination if you have post-concussion syndrome.

Your doctor may also suggest some tests to check your mental processes. For example, tests of your memory. You may be asked to complete a questionnaire about your symptoms. Sometimes, your doctor may suggest a scan of your brain, such as a CT scan or an MRI scan. This is mainly to make sure that there are no other reasons for your symptoms - for example, bleeding around the brain after a blow to the head.

What is the treatment for post-concussion syndrome?

For most people, the symptoms of post-concussion syndrome usually improve and go away within three months after the initial blow to the head. Many find that having a diagnosis and an explanation for their symptoms helps.

There is no specific treatment that seems to speed up recovery. Any treatment that is given is aimed at relieving specific symptoms.

There are some things that you may find helpful if you have been diagnosed with post-concussion syndrome:
- Don't rush back into things - it is generally advised that anyone who has had a head injury should take things slowly. If possible, try to return to your usual activities gradually after a head injury.
- Sleep hygiene - if you are having problems sleeping and are feeling very tired, try to stick to a regular schedule.
- Medication to help symptoms - your doctor may suggest some medication to help some of the symptoms of post-concussion syndrome that you may have. For example, painkillers for headache, medication to help with nausea symptoms or an antidepressant if you have symptoms of depression.
Keep your stress levels down. Avoid alcohol and recreational drugs.

If your symptoms are prolonged or particularly troublesome, your doctor may suggest referral to a specialist used to dealing with problems related to head injury. This may be a neurologist, who specialises in problems of the nervous system, or a neuropsychiatrist or neuropsychologist, who specialises in problems relating to the brain and mental health, or a rehabilitation medicine specialist.

There are various other healthcare professionals who may be able to help in your rehabilitation, including occupational therapists and physiotherapists. They may help you to develop strategies to cope with memory, concentration and other problems. Cognitive behavioural therapy and relaxation techniques may also be helpful for some people.

It is extremely important to reduce the risk of any further head injury while you recover from post-concussion syndrome. A further head injury during this time can cause a much greater impact on the brain. This is sometimes called second impact syndrome (SIS). This may be particularly relevant to people returning too early to a sport such as football or rugby after a head injury. The effects of SIS can be devastating with permanent brain damage. However, the risk of SIS is very low. Repeated concussions also cause other risks such as dementia.

Can post-concussion syndrome be prevented?

Things that can prevent or reduce injury to the head in the first place can also help to prevent post-concussion syndrome. These include:

- Wearing a seat belt in a car or other vehicle.
- Wearing a helmet whilst cycling, riding a motorbike or doing high-risk sports such as skiing.
- Wearing a hard hat for certain jobs in the workplace and at home.

Further reading & references

- Brain injury rehabilitation in adults; Scottish Intercollegiate Guidelines Network - SIGN (Mar 2013)
- Minor brain injury - a guide for GPs; Headway
- Head injury, NICE CKS, July 2016 (UK access only)

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