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What is serotonin syndrome and what causes it?

Sometimes referred to as the 'happy' brain chemical, serotonin is a neurotransmitter that is linked to our mood and other important functions. Several medications that treat depression, anxiety and other mental health problems work on serotonin levels and other neurotransmitters to help improve your mood and other symptoms. On rare occasions, though, antidepressants can trigger a dangerous reaction called serotonin syndrome.

What is serotonin syndrome?

Serotonin - also known as 5-hydroxytryptamine, or 5-HT - is a chemical that functions as a neurotransmitter to carry signals between nerve cells throughout your body. In the brain, serotonin helps to regulate **mood** and **memory**, but it also has other important roles such as aiding digestion.

Serotonin's effect on mood is why it's often a target of medications that are used to treat **mental health** conditions. For example, increasing serotonin levels is the purpose of the class of **antidepressants** known as **selective serotonin reuptake inhibitors** (SSRIs). However, it is possible for serotonin levels to become too high - so-called serotonin syndrome.

"Serotonin is a chemical which is naturally produced in the body and is required for nerve cells and the brain to function," says **Dr Natasha Bijlani** - consultant psychiatrist at the **Priory Hospital Roehampton London**.

"Too much serotonin leads to the development of a set of potentially dangerous symptoms called serotonin syndrome. Serotonin syndrome usually occurs as a result of taking **medications** that cause high levels of serotonin to accumulate in the body," she explains. "Serotonin syndrome can be a life-threatening condition and should be regarded as a medical emergency. It requires immediate treatment."

What causes serotonin syndrome?

SSRI [antidepressants](#) are the most commonly prescribed class of drugs for moderate to severe depression. They can be extremely effective, especially when used alongside other treatments like [talking therapy](#).

However, serotonin syndrome can occur if someone overdoses on their [antidepressants](#), or if they take different types of antidepressant medications at the same time.

"SSRIs work by increasing the availability of serotonin in the brain and other parts of the body," explains Bijlani. "But if multiple [SSRIs](#) are prescribed at the same time or used in conjunction with other serotonin-enhancing medications or substances, then the risk of serotonin syndrome is enhanced."

[Research](#) has shown that various types of antidepressant, including [SSRIs](#), serotonin and norepinephrine reuptake inhibitors (SNRIs), tricyclic [antidepressants](#) and monoamine-oxidase inhibitors (MAOIs), been linked to serotonin syndrome.

"Some cases can arise after a single dose of a selective serotonin reuptake inhibitor (SSRI). It can also arise when the dose of a drug that acts on serotonin levels has increased or a new drug is added," she says. "Some dietary supplements and recreational drugs have also been associated with the development of serotonin syndrome."

Illicit drugs such as cocaine, LSD, amfetamines and ecstasy can affect serotonin levels. [Triptan medications](#) used to treat migraines, and herbal supplements such as [St John's wort](#), can also have an effect. On rare occasions, some over-the-counter [cold medicines](#) can also interact with antidepressants, which may risk increasing serotonin levels.

What are the symptoms of serotonin syndrome?

"Serotonin syndrome symptoms develop within six hours of initial use, change in dose or following overdose," says Bijlani. "Initial serotonin syndrome symptoms are usually mild and include [diarrhoea](#), shivering and feeling more [anxious](#), agitated and restless. Serotonin syndrome symptoms also include [insomnia](#), [headaches](#), rigid muscles, mild [fever](#) and developing goosebumps."

Worsening serotonin syndrome symptoms lead to the development of increased heart rate and [blood pressure](#), dilated pupils, loss of muscle coordination and twitching, alongside heavy [sweating](#) and confusion.

"Signs of severe serotonin syndrome include high fever, [seizures](#), irregular heartbeat with unconsciousness and eventually possible death," says Bijlani.

How to avoid serotonin syndrome

Prescription medication such as [SSRIs](#) should always be taken at doses recommended by your doctor.

"People should be made aware of the possible risk of [serotonin](#) syndrome and what to do if they develop any of the signs and symptoms," says Bijlani. "One should never increase the dose of any medication, or take any additional medications or supplements, without talking to their doctor first."

If you are concerned you have serotonin syndrome, it's important to seek medical help as quickly as possible.

"Serotonin syndrome is regarded as a medical emergency. Serotonin syndrome symptoms can escalate quite rapidly and lead to dangerous consequences," says Bijlani. "Anyone who suspects they may be developing such symptoms should seek urgent medical assistance."

"Serotonin syndrome treatment involves monitoring for vital physical signs and stopping all medications that could be contributing to elevated serotonin levels," she adds. "It might involve managing agitation with suitable medication, reducing body [temperature](#) and the consideration of intensive-care treatment if severe serotonin syndrome has developed."

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