

## Stopping the spiral from ADHD into depression and obesity

***EU-funded researchers are investigating the causes and consequences of ADHD with the aim of improving the lives of patients and reducing their risk of developing linked disorders such as depression and obesity.***



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Attention deficit hyperactivity disorder (ADHD) is a behavioural and emotional disorder that starts in children and persists into adulthood in half of the diagnosed cases. The condition affects between 2 and 5 % of children, adults and older people, impairing their working and social lives and health. And crucially, ADHD seems to be the entry point for a range of other linked disorders. Indeed, more than 80 % of adult ADHD patients suffer from an associated condition such as depression and mood disorders, substance abuse and obesity.

Little has changed in recent years to improve treatment for ADHD, especially in cases where depression and other illnesses co-occur. The aim of the EU-funded COCA project is to find therapies for young ADHD patients that also prevent them from developing linked disorders.

By analysing large Scandinavian datasets, the COCA research consortium has described the magnitude of the problem for the first time. In-depth data analysis has revealed exactly how often comorbid disorders occur alongside ADHD and revealed key risk factors for their development.

This work has also estimated the socio-economic impact of ADHD, showing that the medical costs of an affected person are on average EUR 1 508 higher per year than those of a person without ADHD. Furthermore, for those with an additional disorder, the medical costs are EUR 1 420 to EUR 2 715 higher than individuals who suffer from mood or anxiety disorder, substance abuse or obesity alone. 'We've also shown that there's a genetic correlation between ADHD and some of these disorders, which means that the development

of depression in ADHD cannot solely be attributed to “psychological” factors but rather shared risk genes and hence shared biological mechanisms,’ explains project coordinator Andreas Reif of Goethe University Frankfurt in Germany. ‘For instance, we demonstrated that the neurotransmitter dopamine and its pathway link ADHD and obesity.’

Finding these biological links will help the COCA team and other research groups find new therapies that could treat ADHD and comorbidities at the same time – or prevent other disorders from developing at all.

#### **Bright light at the end of the tunnel?**

Bright light therapy is an established treatment for major depression in adolescents and adults that regulates circadian rhythm, or the sleep/wake cycle. Exercise is proven to prevent and reduce obesity and depressive symptoms through modulation of the dopamine pathway. As COCA researchers have already shown, these pathways form the link between ADHD and its comorbid disorders. An ongoing pilot clinical trial to test the success of these therapies is a key part of the project. Based in Barcelona, Frankfurt, London and Nijmegen, the PROUD study is investigating whether complementary therapies could improve the symptoms of ADHD and other health issues in young patients.

It is the first large-scale, multicentre study to systematically evaluate the role of the dopamine pathway and circadian rhythm and examine their potential relevance for predicting and treating ADHD comorbidities.

#### **Up-to-date and personalised care**

The trial will also examine the success of a mobile health app designed to monitor participants’ sleep and activity patterns, keep them engaged and help them adhere to the treatment programme. The COCA team hope this will improve patients’ general health and reinforce lifestyle choices that will prevent the onset of obesity and depressive symptoms.

‘We are very optimistic that our clinical trial will have a positive outcome that can be implemented into clinical care,’ says Reif. ‘And we hope that our epidemiological data will inform politicians and other stakeholders about the importance of caring about people suffering from ADHD – both regarding clinical care and the need for more research – to empower patients and reduce suffering.’

#### **Project details**

- Project acronym: **COCA**
- Participants: **Germany (Coordinator)**, Netherlands, Sweden, Spain, UK, Estonia, Norway, United States, Denmark
- Project N°: 667302
- Total costs: € 6 192 770
- EU contribution: € 5 999 020
- Duration: January 2016 to December 2020

#### **See also**

**Project website:** <https://www.coca-project.eu/>

**Project details:**

<https://cordis.europa.eu/project/rcn/199729/factsheet/en>

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