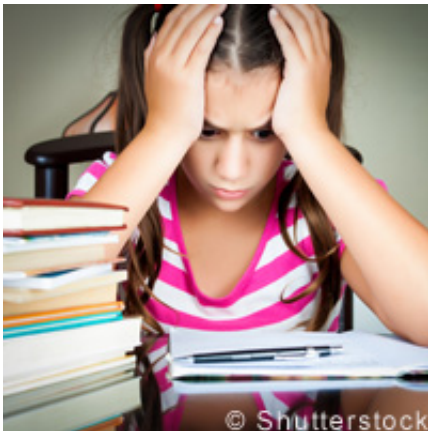


DNA chip for Attention Deficit Hyperactivity Disorder

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Is your child like this? "He does not sit still, he makes you crazy always tapping or moving his leg, he cannot do one thing at a time, he is unable to remain seated at the table during dinner, he goes up and down in the chair without stopping, it's like he's got a motor in him, he doesn't stop talking " In school you hear the teachers say things like "does not listen, does not pay attention, loses everything, unable to do his own work, takes so much time to do, makes so many mistakes'. This is called Attention Deficit Hyperactivity Disorder (ADHD).

[Attention Deficit Hyperactivity Disorder \(ADHD\)](#) is the most common childhood [neuropsychiatric disorder](#). A European survey in 2011 that found children with ADHD have statistically significant impairments in

all aspects of life compared with children without ADHD. Yet, parents take an average of 26.8 months to achieve a diagnosis for their child. There is currently no tool to confirm the diagnosis of ADHD. However, a Spanish researcher Aritz Molano-Bilbao from the the UPV/EHU-University of the Basque Country has come up with a tool that could improve the diagnostic of this disorder and therapeutics treatments.

The prevalence of ADHD is between 8 % and 12 % among infant-adolescents worldwide, and 50 % continue with the symptoms into [adult life](#). Children with ADHD have difficulty paying attention, have difficulty completing assigned and are frequently distracted. They may also display [impulsive behaviour](#) and excessive, inappropriate activity in the context they find themselves in, and experience great difficulty restraining their [impulses](#). 'All these symptoms seriously affects their social, academic and working life of the individuals, and impact greatly upon their families and milieu close to them,' says Molano.

Dr. Molano studied how genetic polymorphisms (variations in the DNA sequence between different individuals) are associated with ADHD. 'We looked for all the associations that had been described previously in the literature worldwide, and did a clinical study to see whether these polymorphisms also occurred in the Spanish population; the reason is that genetic associations vary a lot between some populations and others.'

Around 400 saliva samples of patients with ADHD and a further 400 samples from healthy controls (without a history of psychiatric diseases) were analysed. The use of over 250 polymorphisms led to the discovery of 32 polymorphisms associated not only with the diagnosis of ADHD but also with the evolution of the disorder, with the ADHD subtype, the symptomatological severity and the presence of comorbidities.

On the basis of these results, Dr. Molano proposes a DNA chip with these 32 polymorphisms, could be updated with new polymorphisms.

This chip would not only be used for diagnosing, but also for calculating genetic susceptibility to different variables, including how well the patient is responding well to drugs or normalisation of symptoms.

The study has also confirmed the existence of the 3 ADHD subtypes: lack of attention, [hyperactivity](#), and a combination. 'It can be seen that on the basis of genetics the children that belong to one subtype or another are different explains Dr. Molano.

By contrast, no direct associations were found between the [polymorphisms](#) analysed and the response to pharmacological treatment (atomoxetine and methylphenidate). Dr. Molano believes that this could be due to the fact that 'in many cases the data on drugs we had available were not rigorous,' Due to the difficulty in collecting data of this kind Dr. Molano will be pursuing her research along this line. She says, 'We want to concentrate on the drug response aspect, obtain more, better characterised samples, and monitor the variables in the taking of drugs very closely, whether they were actually being taken or not, etc.'

Dr. Molano hopes that this tool will reach clinics and help children with ADHD.

The project was funded by Progenika Biopharma and the pharmaceutical company JUSTE SAFQ,. Already 10 collaborating clinics belonging to public and private centres in Spain are looking into this tool with the aim in being marketed.

Provided by CORDIS

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