

Pathological gambling is associated with altered opioid system in the brain

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All humans have a natural opioid system in the brain. Now new research, presented at the ECNP Congress in Berlin, has found that the opioid system of pathological gamblers responds differently to those of normal healthy volunteers. The work was carried out by a group of UK researchers from London and Cambridge, and was funded by the Medical Research Council. This work is being presented at the European College of Neuropsychopharmacology congress in Berlin.

Gambling is a widespread behaviour with about 70% of the British population gambling occasionally. However in some individuals, gambling spirals out of control and takes on the features of an addiction – [pathological gambling](#), also known as problem gambling. The 2007 British Gambling Prevalence Survey¹ estimated that 0.6% of UK adults have a problem with gambling, equivalent to approximately 300,000 people, which is around the total population of a town like Swansea. This condition has an estimated prevalence of 0.5–3% in Europe.

The researchers took 14 pathological gamblers and 15 healthy volunteers, and used PET scans (Positron Emission Tomography scans) to measure opioid receptor levels in the brains of the two groups. These receptors allow cell to cell communication – they are like a lock with the neurotransmitter or chemical, such as endogenous opioids called endorphins, acting like a key. The researchers found that there were no differences between the receptor levels in pathological gamblers and non-gamblers. This is different to addiction to alcohol, heroin or cocaine where increases are seen in opioid receptor levels.

All subjects were then given an amphetamine tablet which releases endorphins, which are natural opiates, in the [brain](#) and repeated the PET scan. Such a release – called an 'endorphin rush'- is also thought to happen with alcohol or with exercise. The PET scan showed that the pathological gamblers released less endorphins than non-gambling volunteers and also that this was associated with the amphetamine inducing less euphoria as reported by the volunteers (using a self-rating questionnaire called the 'Simplified version of the amphetamine interview rating scale', or SAIRS).

As lead researcher Dr Inge Mick said:

"From our work, we can say two things. Firstly, the brains of pathological gamblers respond differently to this stimulation than the brains of healthy volunteers. And secondly, it seems that pathological gamblers just don't get the same feeling of euphoria as do healthy volunteers. This may go some way to explaining why the gambling becomes an addiction".

"This is the first PET imaging study to look at the involvement of the opioid system in pathological gambling, which is a behavioural addiction. Looking at previous work on other addictions, such as alcoholism, we anticipated that pathological gamblers would have increased opiate receptors which we did not find, but we did find the expected blunted change in endogenous opioids from an amphetamine challenge. These findings suggest the involvement of the opioid system in pathological gambling and that it may differ from addiction to substances such as alcohol. We hope that in the long run this can help us to develop new approaches to treat pathological gambling"

Speaking on behalf of the ECNP, Professor Wim van den Brink (Amsterdam), Chair of the Scientific Committee for the Berlin Congress, said:

"At the moment, we find that treatment with opioid antagonists such as naltrexone and nalmefene seem to have a positive effect in the treatment of pathological [gambling](#), and that the best results of these medications are obtained in those problem gamblers with a family history of alcohol dependence. But this report from Dr Mick and colleagues is interesting work, and if confirmed it could open doors to new treatment methods for pathological gamblers".

Provided by European College of Neuropsychopharmacology

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