Why teenagers should steer clear of cannabis

ADOLESCENTS' use of marijuana may increase the risk of heroin addiction later in life, a new study suggests. Researchers say the work adds to "overwhelming" evidence that people under 21 should not use marijuana because of the risk of damaging the developing brain.

The idea that smoking cannabis increases the user's chance of going on to take harder drugs such as heroin is highly contentious. Some dub cannabis a "gateway" drug, arguing that peer pressure and exposure to drug dealers will tempt users to escalate their drug use. Others insist that smoking cannabis is unrelated to further drug use.

Now research in rats suggests that using marijuana reduces future sensitivity to opioids, which makes people more vulnerable to heroin addiction later in life. It does so by altering the brain chemistry of marijuana users, say the researchers.

"Adolescents in particular should never take cannabis it's far too risky because the brain areas essential for behaviour and cognitive functioning are still developing and are very sensitive to drug exposure," says Jasmin Hurd, who led the study at the Karolinska Institute in Sweden.

But Hurd acknowledges that most people who use cannabis begin in their teens. A recent survey reported that as many as 20% of 16-year-olds in the US and Europe had illegally used cannabis in the previous month.

"Teenage" rats

In order to explore how the adolescent use of cannabis affects later drug use, Hurd and colleagues set up an experiment in rats aimed to mirror human use as closely as possible.

In the first part of the trial, six "teenage" rats were given a small dose of THC the active chemical in cannabis every three days between the ages of 28 and 49 days, which is the equivalent of human ages 12 to 18. The amount of THC given was roughly equivalent to a human smoking one joint every three days, Hurd explains. A control group of six rats did not receive THC.

One week after the first part was completed, catheters were inserted in all 12 of the adult rats and they were able to self-administer heroin by pushing a lever.

"At first, all the rats behaved the same and began to self-administer heroin frequently," says Hurd. "But after a while, they stabilised their daily intake at a certain level. We saw that the ones that had been on THC as teenagers stabilised their intake at a much higher level than the others they appeared to be less sensitive to the effects of heroin. And this continued throughout their lives."

Hurd says reduced sensitivity to the heroin means the rats take larger doses, which has been shown to increase the risk of addiction.

Drug memory

The researchers then examined specific brain cells in the rats, including the opioid and cannabinoid receptors. They found that the rats that had been given THC during adolescence had a significantly altered opioid system in the area associated with reward and positive emotions. This is also the area linked to addiction.

"These are very specific changes and they are long-lasting, so the brain may 'remember' past cannabis experimentation and be vulnerable to harder drugs later in life," Hurd says.

Neurologist Jim van Os, a cannabis expert at the University of Maastricht in the Netherlands told **New Scientist** the research was a welcome addition to our understanding of how cannabis affects the adolescent brain.

"The issue of cross-sensitisation of cannabis/opioid receptors has been a controversial one, but these findings show the drug's damaging effects on the reward structures of the brain," van Oshe says. "There is now overwhelming evidence that nobody in the brain's developmental stage under the age of 21 should use cannabis."

The research appears in the online edition of *Neuropsychopharmacology*.
(New Scientist)

