Violence genes may be responsible for one in 10 serious crimes

Scientists at the Karolinska Institute in Sweden believe they have found which genes are responsible for high levels of rage and violence

Two gene variations may be responsible for violent crime, Swedish researchers believe Photo: Getty Images

By Sarah Knapton, Science Editor

12:58PM GMT 28 Oct 2014

The genes for extremely violent behaviour have been discovered by scientists who fear they may be responsible for one in 10 serious crimes.

Researchers at the Karolinska Institute in Sweden analysed the genetic make-up of 895 criminals from Finland to see if violence was in their DNA.

The majority of violent crime is committed by a small group of antisocial, repeat offenders, who seem incapable of rehabilitation.

Now scientists believe they have found which genes are responsible for high levels of rage and violence. They believe that they could be responsible for up to 10 per cent of serious crime in Finland.

The criminals who had committed the most serious crimes, such as murder, were found to have

variants of two genes; monoamine oxidase A (MAOA) and cadherin 13 (CDH13).

MAOA is linked to dopamine levels in the brain, a chemical which makes people feel happy and fulfilled. CDH13 is linked to impulse control.

“When compared to the control population, non-violent offenders were not observed to exhibit either variant to a greater degree, indicating that these genetic variants may be specific to extremely violent behaviour,” said lead researcher Professor Jari Tiihonen.

The researchers, whose findings were published online in the journal Molecular Psychiatry, also suggest that the low dopamine levels associated with the MAOA gene may make carriers more aggressive when drunk or on drugs, increasing the risk of violent behaviour.

British scientists said the study could help identify potential criminals early when it was still possible to treat their violent tendencies.

Dr William Davies, Senior Lecturer in the Behaviour Genetics Group, at Cardiff University, said: “The study is an interesting, and potentially important, one which indicates two genetic regions where variation may influence the likelihood of being convicted of multiple violent crimes.

“Should these preliminary findings hold up, they would have significant implications for: i) identifying potentially violent offenders at an earlier stage and therefore for implementing suitable early interventional strategies and ii) for identifying neurobiological pathways that might be amenable to treatment.”

Dr Malcolm von Schantz, Reader in Molecular Neuroscience, University of Surrey, said: “Behavioral genetics is a very interesting area of research, but also one that is full of controversies.

“There is both the issue of whether a genetic association can be replicated, and the issue of how to interpret it – the public will be asking themselves if the scientists suggesting that violent offenders should not be fully accountable for their actions.

“So does this paper bring us closer to a situation where violent criminals can claim diminished responsibility because of the genes that they were born with?

“I think we have to remember that it becoming increasingly clear that there is not one single genetic variant that has a large effect on this, or indeed any complex behaviour.

“The pattern that is emerging is one of many genetic factors where each one has a small

predisposing effect.”

However some British researchers criticised claims that the genes could be responsible for such large amounts of crime in Finland.

Prof John Stein, Emeritus Professor of Physiology, University of Oxford, said "This is a very interesting study with plausible aspects.

“But please do not accept the claims that these alleles are 'responsible for 5-10 per cent of violent offences in Finland'. All they show is that they may contribute 5-10 per cent to the chance of an individual being very violent.

“These alleles are quite common and so environmental factors are probably much more important. For instance simply improving prisoners diets can reduce their violent offending by 37 per cent."

Prof Jan Schnupp, Professor of Neuroscience, University of Oxford, added: "Half the people in your office will carry these genes. Odds are 50/50 that you do. How violent has your day been? To call these alleles "genes for violence" would therefore be a massive exaggeration.

“In combination with many other factors these genes may make it a little harder for you to control violent urges, but they most emphatically do not predetermine you for a life of crime.”