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Transsexual study reveals genetic link

Helen Carter
ABC

Monday, 27 October 2008

The discovery of a genetic variation in male to female transsexuals adds weight to the view that transsexualism has a biological basis, the Australian researchers behind the find say.

Their study shows male to female transsexuals are more likely than non-transsexual males to have a longer version of a receptor gene for the sex hormone androgen or testosterone.

The findings from the largest-yet genetic study of male to female transsexualism are published online today in *Biological Psychiatry* .

Study leader, head of molecular genetics at Prince Henry's Institute of Medical Research in Melbourne, Associate Professor Vincent Harley, speculates, based on cell studies, that this genetic variation might reduce testosterone action and "under-masculinise" or feminise the brain during foetal development.

Gender gene: Transsexualism maybe a condition that develops in the womb, researchers say *(Source: iStockphoto)*

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"Studies in cells show the longer version of the androgen receptor gene works less efficiently at communicating the testosterone message to cells," Harley says.

"Based on these studies, we speculate the longer version may also work less efficiently in the brain."

'More feminised brain'

The researchers suggest reduced androgen and androgen signalling contributes to the female gender identity of male to female transsexuals.

"It is possible that a decrease in testosterone levels in the brain during development might result in incomplete masculinisation of the brain in male to female transsexuals, resulting in a more feminised brain and a female gender identity," they say.

People develop an inner sense of being male or female from an early age but transsexuals identify with a physical sex opposite to their biological sex.

Some theories suggest causes include psychosocial factors including dysfunctional family dynamics and traumatic childhood experiences.

But research is increasingly implicating biological factors including family history and genetics.

"There is a social stigma that transsexualism is simply a lifestyle choice, however our findings support a biological basis of how gender identity develops," Harley says.

Marginalised

"It's a very tough condition. These people are often on the margins of society, are ostracised, poor, unemployed - it's not something you would want to choose yet still some people think it's a choice when it's more likely transsexuals are born like that."

The Australians collaborated with American scientists whose research on male and female brains suggests genes might interact with hormones and other environmental factors in creating gender identity.

Prince Henry's student Lauren Hare collected blood or saliva from 76 male to female transsexuals from around Australia and 36 from America.

She compared their DNA with that of 258 non-transsexual males.

She studied variations in three sex steroid genes involved in actions of the sex hormones androgen and oestrogen - an oestrogen receptor, the aromatase enzyme which converts androgen to oestrogen and the androgen (testosterone) receptor gene.

She hypothesised transsexuals could be under-masculinised and over-feminised due to the function of these genes.

Researchers hope to double the study and investigate the three sex steroid genes and other genes involved in androgen-oestrogen function.

Collaborators were from Monash University , Melbourne University , the University of California, Los Angeles and the Monash Gender Dysphoria Clinic.

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