Cleft lip and palate: Genes more important than thought?

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Comparing 500,000 snippets of human DNA put scientists from the University of Bonn on the right track. A genetic variant on chromosome 8 occurs with significantly higher frequency in people with cleft lip and palate than in the control group. The results are to be published in the forthcoming issue of the journal *Nature Genetics*.

Cleft lips and palates are among the most frequent innate abnormalities. One in about 700 babies in Central Europe are affected. Children in particular suffer a lot from the deformity, even if the insulting and discriminating term 'harelip' has fortunately almost died out.

In the cleft lip and palate, different tissue processes of the face and mouth area do not fuse together or do so insufficiently. This results in a gap remaining between lip, jaw and sometimes the palate. It seems likely that several factors have to add up in order for clefts to form. Both environmental influences which have an impact on the child in the womb and genetic factors contribute to the deformity. However, the results of the scientists from Bonn could also point to genes playing a far more important role in the formation of clefts than was previously thought.

The long arm of chromosome 8

The human geneticists from the University of Bonn had examined the DNA of 460 persons with clefts. More than half of them were examined more closely. The scientists analysed more than 500,000 items of

information from their DNA and then compared these with the genetic snippets of a control group. A specific area in the human genome caught the scientists' attention. 'This was a point on the long arm of chromosome 8, where the cleft group conspicuously often had a variant, far more frequently than people who had no abnormality,' Dr. Elisabeth Mangold, a lecturer from the Institute of Human Genetics at the University of Bonn, explains. This is a notable clue that a gene located in this region has something to do with the occurrence of clefts.

Good news for mothers of children affected

'Without this genetic factor on chromosome 8, the probability of a child in our population of getting clefts would be significantly less than 1 in 700,' Elisabeth Mangold points out. 'In effect, this is good news for all mothers of the children affected, who always thought, "I must have done something wrong while I was pregnant." You just can't help having the genes you have got.'

Further research now aims to show which gene exactly on chromosome 8 is responsible and how it works. 'We are currently looking for it,' Dr. Mangold explains. 'It could indeed be what is known as a regulatory element that controls other genes.' When the mechanisms of all the genes involved and the interplay with environmental factors are understood, the scientists can also say whether prophylaxis involving medication during pregnancy makes sense. There are currently several indications that taking particular vitamins during pregnancy can counteract deformities in embryos.

Source: University of Bonn