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*Feeling young: TV director Michael Gill, 73 and Chloe, 15*

# Daughters of older fathers die younger

*by Steve Connor  
Science Correspondent*

IN A finding that sheds new light on the ageing process, scientists have discovered that men who father children later in life are more likely to produce daughters who have a shorter lifespan.

A study of European royal families, including the House of Windsor, discovered that men who have children in late middle age are more likely to have daughters who die earlier in life than the daughters of younger men.

The effect does not extend to sons, nor to the daughters of older women. Scientists believe its uniqueness to the female offspring of older men raises the prospect of finding longevity genes on the X chromosome, which men pass on only to their daughters.

The research, one of the most comprehensive investigations into the age of fatherhood, has focused attention on the role the X chromosome may have on the ageing process. Last week another

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study showed that the X chromosome carries a gene for "social intuition" that seems to be switched off in boys but activated in girls. Scientists said the new findings were especially important in view of the trend to have children later in life.

Many men who marry for a second or third time have become fathers at a much older age than was usual. Typical examples are Ravi Shankar, 76, the sitar player who influenced the Beatles, who has a daughter, Anoushka, 15, and Michael Gill, the television documentary director, who was 58 when he fathered a daughter, Chloe, 15.

Gill said that Chloe had kept him active and feeling young: "I might not be working so hard if I didn't have a daughter who had to be educated. It was a gift to have had her."

The scientists who carried out the study emphasised that their findings did not mean that daughters of older men were doomed to an early grave. At most the research shows that there is a statistical probability of them living a few years less than daughters of younger men.

Dr Leonid Gavrilov and his wife Natalia, from the Moscow State University in Russia, said their findings were nevertheless the first to indicate the importance of a man's age at the time of conception in the life expectancy of his children. "This opens some new directions for the study of longevity," said Gavrilov.

The couple trawled through the genealogical records of more than 700 royal families in Europe, including the relatives of Queen Victoria. They compared lifespans of royal sons and daughters with the age of their parents at birth.

The study, which looked at more than 7,000 people, revealed that daughters born to fathers in their thirties lived on average to 74.5 years, but those with fathers who were in their fifties at conception had an average lifespan of 72.4 years. Gavrilov said this was highly significant in statistical terms and showed there was a real effect that was not due to chance. The scientists said they detected virtually no effect below the age of 50 but a dramatic decrease in longevity for daughters of men above this age. However, they warned this might merely be due to the way

they analysed the data.

A possible explanation is that the sperm of older men carries more genetic mutations due to the many cell divisions that have resulted in its production. Gavrilov said a man aged 20 produced sperm that had resulted from about 200 cell divisions, compared with the 890 divisions that took place in the testes of a man aged 50. Women, he said, were born with all their eggs intact and these were estimated to have gone through only 24 divisions.

One implication is that genetic components that influence life expectancy have been underestimated. "Since only daughters inherit the paternal X chromosome, this sex-specific decrease in longevity of daughters born to old fathers might indicate that human longevity genes are located on this chromosome," he said.

Other scientists believe the findings could lead to a breakthrough in the search for longevity genes. Dr Gordon Lithgow from Manchester University, an expert on ageing, said: "There's always been a lingering suspicion that older people having children will have an effect on lifespan. They have found something that is not just a statistical effect."

Dr Richard Suzman, from the US National Institute on Ageing, said the Russian research strongly suggested there were biological consequences of late marriages. "There is an increasing number of older men marrying younger women, so one wonders what impact that would have," he said.

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