Better fathers have smaller testicles

Study finds evolutionary trade-off between mating prowess and parenting involvement.

Sarah Zhang

09 September 2013

Sam Edwards/Alamy

Men with larger testes were rated lower in surveys of their parenting involvement, and brain scans showed they had lower activity in an area that is part of the brain's reward system.

Fathers with smaller testes are more involved in child care, and their brains are also more responsive when looking at photos of their own children, according to research published online today in the *Proceedings of the National Academy of Sciences*[1].

Evolutionary biologists have long observed a trade-off in male primates between mating efforts to produce more offspring and the time males spend caring for their progeny. For instance, male chimpanzees, which are especially promiscuous, sport testes that are twice as big as those of humans, make a lot of sperm and generally do not provide paternal care. By contrast, male gorillas have relatively small testes and protect their young. The latest study suggests that humans, whose paternal care varies widely, show evidence of both approaches.

The analysis[1] incorporates measures of testicular volume, brain activity and paternal behaviour, notes Peter Gray, an anthropologist at the University of Nevada, Las Vegas, who was not involved in the study. “We’ve got something that pulls those strands together, and it does so in a really interesting way.”

The research team — led by James Rilling, an anthropologist at Emory University in Atlanta, Georgia — set out to investigate why some fathers are more involved in child care than others. The researchers recruited 70 fathers of children aged between one and two years, and scanned the men’s brains and testes in a magnetic resonance imaging (MRI) machine. The fathers and the children's mothers also filled out surveys rating the fathers' commitment to child care.

Proud parents

When men were shown photos of their own children, those rated as better fathers by their female partners had more activity in the ventral tegmental area (VTA) of the brain, part of its reward system. Men with larger testes were rated lower in surveys of their parenting involvement and had less activity in the VTA. Because testes size is correlated with sperm count, Rilling and his team took the size as a measure of mating effort.

The researchers also analysed the men’s testosterone levels, confirming a previous finding that fathers involved in caring for their children have lower levels of the hormone[2].

“It’s a very provocative and important step,” says Sarah Hrdy, an emeritus anthropologist at the University of California, Davis. She adds that more research is needed to establish whether certain men are predisposed by biology to be more nurturing. The study’s authors say that even if men are predisposed to a certain style of parenting, nurturing dads can be made as well as born. That levels of testosterone changed as a father spent more time with his child suggest flexibility in a man's inclination toward fatherhood.

Charles Snowdon, a psychologist at the University of Wisconsin-Madison, points out that the paper’s own statistics show testes size explains only a fraction of the variation in paternal care. “There are lots of other variables that affect fatherhood,” he says, citing as examples social environment and prior experience looking after younger siblings when the men were children themselves.

Rilling and his team plan to test how testicular size is affected by factors such as genetics or the man having an absent father. They were surprised to find little research on how testes size changes in response to life events. “Testicular imaging is sort of a unique niche right now,” says Rilling.

Nature | doi:10.1038/nature.2013.13701

References

1. Mascaro, J. S., Hackett P. D. & Rilling, J. K. *Proc. Natl Acad. Sci. USA* http://dx.doi.org/10.1073/pnas.1305579110 (2013).
2. Gettler, L. T., McDade, T. W., Feranil, A. B. & Kuzawa, C. W. *Proc. Natl Acad. Sci. USA* **108**, 16194–16199 (2011).