Every parent wants a healthy baby, and most try very hard to ensure their child gets the best possible start in life. For women, one way to promote healthy babies is by considering age when making childbearing decisions. The risks of pregnancy complications and birth defects increase as women grow older, so some may choose to have babies earlier in life or, if over 35, demand more prenatal testing. However, a recent animal study suggests that men may also need to think about age when considering having children.

The study’s researchers knew from previous experiments that older animals tend to have offspring with more defects. They wanted to know why. So they looked at a process called methylation that occurs in DNA, the code or building block for all organisms. Methylation happens when small “tags”, called methyl groups, attach themselves to part of the DNA. The tags can modify how the DNA works, potentially creating changes to the cells and ultimately to the organism. Methylation has been linked to genetic diseases, cancer and abnormal development in humans. It is a powerful process with potentially long-term effects on the body.

Changes to DNA methylation have been observed in the body cells of mammals with aging, but researchers wanted to see if sperm cells would also show these changes. They compared DNA methylation patterns of sperm and liver cells of young and old Brown-Norway rats. Through a special screening process, they were able to find specific areas in the DNA of sperm and liver cells where there was an increase in methylation, called hypermethylation, as the rats aged.

Dr. Jacquetta Trasler, Director of the Developmental Genetic Laboratory at the Montreal Children’s Hospital Research Institute and one of the study’s researchers, notes, “There have been lots of studies focusing on the mother, on the quality of the eggs, for example. But we haven’t worried as much about men.” Trasler adds that what is needed now is longitudinal studies of men to examine the relationship among growing older, decreased fertility and an increase in birth defects in offspring.

LONG-TERM STUDIES OF AGING MALES ARE NEEDED

Dr. Cheri Deal, Associate Professor of pediatrics at the Université de Montréal, calls the study “highly relevant.” “There are animal studies that clearly show that aging rodents produce offspring with birth defects.” Deal praises the study for finding the specific areas of the sperm and liver cells that have hypermethylation. “Now, it’s time for more studies, starting with other kinds of rats and then with humans”, she adds. As Deal notes, there is a small concern that the hypermethylation seen as the rats age may be specific to the kind of rat used.

“Ultimately, the goal will be to apply the research methods and techniques to human males, ideally through longitudinal studies”, she adds. The information gleaned from those studies will help mothers and fathers evaluate the risks involved with delaying pregnancy and childbirth into the later years.


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