Offspring of older fathers may live longer: study

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A man in Cebu City, in the Philippines, where the study took place. (EA Quinn)

(Medical Xpress) -- If your father and grandfather waited until they were older before reproducing, you might experience life-extending benefits.

Biologists assume that a slow pace of aging requires that the body invest more resources in repairing cells and tissues.

A new Northwestern University study suggests that our bodies might increase these investments to slow the pace of aging if our father and grandfather waited until they were older before having children.

"If your father and grandfather were able to live and reproduce at a later age, this might predict that you yourself live in an environment that is

somewhat similar — an environment with less accidental deaths or in which men are only able to find a partner at later ages," said Dan T.A. Eisenberg, lead author of the study and a doctoral candidate in anthropology at Northwestern. "In such an environment, investing more in a body capable of reaching these late ages could be an adaptive strategy from an evolutionary perspective."

Christopher W. Kuzawa, co-author of the study, associate professor of anthropology at Northwestern and a faculty fellow at the University's Institute for Policy Research, said the new findings are fascinating.

"If our recent ancestors waited until later in adulthood before they reproduced, perhaps for cultural reasons, it would make sense for our bodies to prepare for something similar by investing the extra resources necessary to maintain healthy functioning at more advanced ages," Kuzawa said.

The study, which was conducted in the Philippines, found that children of older fathers not only inherit longer telomeres, which are DNA found at the ends of chromosomes, but that the association of paternal age with offspring telomere length is cumulative across multiple generations. Shorter telomeres seem to be a cause of ill health that occurs with aging — longer telomeres seem to promote slower aging.

It appears that as men delay reproduction, they will pass on longer telomeres to offspring, which may facilitate extension of life span and allow reproducing at older ages.

Eisenberg said he hopes the study will further our understanding of the evolution of aging, why we get old and the ways that we adapt to the environment.

"When we think of adaptation, we tend to think of it happening over

hundreds of generations," Eisenberg said. "This study illustrates a means by which much more rapid adaptive genetic changes might occur over just a few generations."

"The idea that information about the environment can be passed on biochemically from one generation to the next is certainly not something new," said M. Geoffrey Hayes, co-author of the study, assistant professor of medicine at Northwestern's Feinberg School of Medicine and assistant professor of anthropology at Northwestern. "But what is quite unique in the case of our telomere study is that we're seeing an association across more than one generation."

The researchers said their study should not be taken as a recommendation that men reproduce at later ages as previous research has shown that older fathers are more likely to pass along harmful mutations to their offspring at conception, which can lead to increased rates of miscarriage and other health issues in offspring.

However, Kuzawa said, "These new findings suggest that there might also be underappreciated benefits to having an older father or grandfather."

And while the findings are fascinating, Kuzawa said they will need to see if they are replicated in other populations.

"We will want to see if the longer telomeres that offspring of older fathers and grandfathers inherit at birth have fewer health problems and ailments as they age," Kuzawa said. "Based upon our findings, we predict that this will be the case, but this is a question to be addressed in future studies."

More information: "Delayed Paternal Age of Reproduction in Humans Is Associated With Longer Telomeres Across Two Generations

of Descendants" will publish June 11 in the *Proceedings of the National Academy of Sciences*.

Provided by Northwestern University