

Why running long distances isn't helpful to human body

Ultra-endurance running may expedite the aging process. This, the researchers note, is primarily because it causes red blood cells to age and break down faster than the body can replace them.

BY ROBERT MADOI

A new study published in *Blood* *Red Cells & Iron*, a peer-reviewed journal from the American Society of Hematology (ASH), has underscored how less is more when it comes to distance running. The study's findings challenge the almost settled view among members of burgeoning running clubs in the Uganda capital of Kampala that there are rich rewards when one pushes the limits of their performances in ultra-marathon distances.

Pushing the body towards ultra-marathon distances is widely known to leave one exhausted and in pain. Less known, but no less remarkable, per the new study conducted by an international team of researchers, is the damaging impact such gruelling episodes have on red blood cells. Ultra-endurance running may expedite the aging process. This, the researchers note, is primarily because it causes red blood cells to age and break down faster than the body can replace them.

Ultra-marathons span distances anywhere between 40 kilometres and 171 kilometres. For their study, the researchers considered 23 elite runners figuring in either the Martigny-Combes à Chamonix race (40 kilometres at a 2,300m+ elevation) or the Ultra Trail deMont Blanc race (171 kilometres at a 10,000+ elevation).

It was discovered that such distances have the potential to compel red blood cells to be less flexible. This greatly inhibits their ability to deliver oxygen and remove waste throughout the body. The reduced flexibility culminates in a precipitous drop in blood cells, with the stiffer ones finding themselves on the wrong end of a grand clear-out.

The shift of the cells from a disc shape to something more spherical is also, the study discloses, not without implications. A disc shape allows the cells to almost effortlessly squeeze through blood vessels within the spleen that are microscopically small and specialised. The spherical shape means they get stuck in the spleen and eaten up by immune cells, according to the researchers.



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The elite runners whose extreme exercise inflicted the molecular damage to their cells were those who took part in the Ultra Trail deMont Blanc race. As their cells circulated during the race, they faced extensive damage brought to bear on them by inflammation, oxidative stress, and mechanical pressure. Such is the extent to which the scale of damage impacts the body's cardiovascular system that the red blood cells of the elite runners in question bears a striking resemblance to changes seen in stored blood.

"Understanding these shared pathways gives us a unique opportunity to learn how to better protect blood cell function both in athletes and in transfusion medicine," Angelo D' Alessandro at the University of Colorado Anschutz (CU Anschutz) in the US, one of the researchers who analysed blood samples from 11 adults aged 36 for the study, told the online publication *ScienceAlert*.

Travis Nemkov, a biochemist and molecular geneticist from CU Anschutz told *ScienceAlert* thus: "At some point between marathon and ultra-marathon distances, the damage really starts to take hold."

He added: "We've observed this damage happening, but we don't know how long it takes for the body to repair that damage, if that damage has a long-term impact, and whether that impact is good or bad."

Nemkov and his fellow researchers, who conducted the study, observed a telling increase in acylcarnitines and kynurenine. The metabolic compounds are important biomarkers for various physiological states, including aging, energy metabolism, and neurological health.

The metabolic shift that the researchers noticed in their study was headlined by oxidative stress and lipid damage.

"Anecdotally, the blood after an ultra-marathon looks like the blood of somebody who's just been hit by a car," D' Alessandro disclosed.

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