

High altitude training offers clues to fighting lethal health problems

Inflammation can kill, study shows, yet the body can adapt.



(Image: Wikimedia Commons)

When the body is deprived of oxygen during a major surgery, the kidneys, heart muscles or lungs can be injured as a result. The problem is that lack of oxygen can lead to inflammation.

Yet some athletes deliberately train at high altitude, with less oxygen, so they can perform better. Their bodies adapt to the reduced oxygen.

Now a doctor at the University of Colorado School of Medicine has explored the relationship between lack of oxygen, called hypoxia, and the inflammation that can injure or kill some patients who undergo surgery. In a liver transplant, for example, the surgery and anaesthesiology can go perfectly yet the new liver will fail because of hypoxia.

"Understanding how hypoxia is linked to inflammation may help save lives of people who have survived a major surgery only to be faced with potential harm to major organs," says Holger K. Eltzschig, MD, PhD.

Eltzschig's exploration of the relationship between hypoxia and inflammation was published 17 February in the *New England Journal of Medicine*. His work was supported by more than US\$1 million from the National Institutes of Health.

How can patients benefit from the findings?

Those high-altitude athletes figured into the research. How do their bodies adapt to low levels of oxygen? Moreover, how can that information help patients?

The answer appears to lie at the molecular level. The body can signal a helpful response to deal with low oxygen levels. To do so it uses what's called hypoxia-inducible factor (HIF). This is a protein that sends complex signals to help the body

defend itself.

Eltzschig says that research now should focus on understanding more about the way these signals function.

Benefits for organ transplant patients?

"By focusing on the molecular pathways the body uses to battle hypoxia, we may be able help patients who undergo organ transplants, who suffer from infections or who have cancer," says Eltzschig, a professor of anaesthesiology, medicine, cell biology and immunology.

"We know the body can do this. Our research goal now is to find out exactly how."

Faculty at the University of Colorado School of Medicine work to advance science and improve care. These faculty members include physicians, educators and scientists at University of Colorado Hospital, The Children's Hospital, Denver Health, National Jewish Health, the Denver Veterans Affairs Medical Centre. The school is located on the Anschutz Medical Campus, one of four campuses in the University of Colorado system. To learn more about the medical school's care, education, research and community engagement, please visit its web site.

Source: University of Colorado School of Medicine

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