

# Everest pedal explores thin air

February 17 2011, by Cath Harris

---

(PhysOrg.com) -- A trek to Everest base camp is helping Oxford University researchers investigate the links between heart failure and the low oxygen levels suffered by patients with a range of serious diseases.

Dr Cameron Holloway, Dr Nick Knight and Dr Andrew Murray from Oxford University's Department of Physiology, Anatomy and Genetics and the Oxford Centre for Clinical Magnetic Resonance Research were among several hundred volunteer hikers walking to the foot of [Mount Everest](#) to study the body's response to the thin air.

The team wanted to simulate the condition of hypoxia – when the body or part of the body is deprived of sufficient oxygen. Patients with pneumonia, smoking-related diseases and some forms of heart failure suffer hypoxia.

It was Dr Holloway's first experience of such a severe climate and he was startled by some of the findings. Among the most significant were changes to blood oxygen levels and energy synthesis.

'I was amazed at how low the arterial [oxygen levels](#) fell in our blood,' Dr Holloway said. 'Saturation was in the 70 and 80 per cents during simple exercise at altitude when normally you would get worried if it dropped from normal at 98 per cent to 93 per cent.'

'Usually that level isn't compatible with life. If someone came in with levels that low we would rush them into intensive care.'

Another ‘huge shock’ was the 25 per cent drop in the cardiac phosphocreatine/adenosine-triphosphate (PCr/ATP) ratio – a measure of the amount of energy available to the heart.

‘People with heart disease often have this ratio impaired. We experienced similar impairment, even reaching the levels of heart failure. We don’t know if it was due to adaptation to low oxygen or showed that our hearts were not coping.’

Dr Holloway’s study of 14 of the volunteers ran alongside a larger research project by Caudwell Xtreme Everest, part of the UCL Centre for Altitude, Space and Extreme environment medicine (CASE). The findings were published recently in *The FASEB Journal*.

Before leaving for Nepal, participants underwent wide-ranging tests, including assessments of heart, vascular, brain and exercise performance. Blood and other tests were carried out at several points during the 11-day ascent from Lukla’s Tenzing-Hilary Airport at 2,850m to 5,360m base camp.

The initial tests, which took place in Oxford, were repeated within 48 hours of the group’s return from Everest and carried out again six months after the trek ended. By then all changes to the heart and energy levels had returned to the pre-trek baseline.

Dr Holloway suspects that the findings witnessed during the Everest trip may have parallels with the cause of some forms of heart failure:

‘At base camp the symptoms we had, including breathlessness and exercise intolerance, were similar to those experienced by heart failure patients.’

‘Even a small amount of exercise was really difficult. That’s what people

have to deal with when they have pneumonia or other diseases.’

Dr Holloway hopes the lessons from the study will improve care for critically ill adults and children, and even babies in incubators.

‘Now we are looking at heart failure patients to see if low oxygen is the problem and if changing oxygen pathways could improve the lives of [heart failure](#) patients. We also need to work out what is behind individual differences in the changes people experience as a result of low oxygen.’

**More information:** [www.fasebj.org/content/25/2/792.abstract](http://www.fasebj.org/content/25/2/792.abstract)

Provided by Oxford University

Citation: Everest pedal explores thin air (2011, February 17) retrieved 8 May 2024 from <https://medicalxpress.com/news/2011-02-everest-explores-thin-air.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.