

## **Sleep-related breathing disorders**

### **Intermittent Hypoxia and Unsaturated Aldehydes - The Effect on Oral Epithelial Wound Healing**

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Obstructive sleep apnea (OSA) is a highly prevalent sleep breathing disorder characterized by intermittent hypoxia (IH), leading to blood hypoxemia, hypercapnia and sleep fragmentation. However, studies on its effects on oral epithelial tissue healing are limited. Smoking is considered a risk factor for OSA and numerous systemic disorders through constant exposure to chemically active toxins, including aldehydes. Acrolein is the most chemically active unsaturated aldehyde, impairing a variety of biological processes. Our aim was to study the effect of IH on oral epithelial tissue healing, with and without acrolein.

HaCaT cells were exposed to 28 -IH -cycles (5-20% oxygen) during 12-hours using the BioSpherix OxyCycler-C42 system. Control cells were maintained in normoxic conditions or in sustained hypoxia (SH) (5% oxygen) for the same period. A cross-scratch was made in the cell cultures at time-0 and the migrating abilities of cells were measured after 24-hours, by calculating the percent of the residual cross-scratch area. In parallel experiments, 25µM acrolein was added to each treatment.

The scratch closure was the slowest under IH. After 24-hours, the residual scratch area in the IH treated cells was 29.5±13.4% of the initial area, while in normoxia and SH it was 9.2±5.8% and 10.3 ±11.3%, respectively (p

IH may cause a delay in the healing process of oral epithelial tissue by slowing cells migratory abilities. The healing may be further slowed by chemically active unsaturated aldehydes such as acrolein.