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Title: Acetazolamide improves cardiac dysrhythmias in patients with obstructive sleep apnea at altitude. A randomized controlled trial

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Body: Background: Untreated lowlanders with obstructive sleep apnea syndrome (OSA) benefit from acetazolamide (AC) during an altitude stay in terms of improved nocturnal oxygenation, breathing disturbances and sleep quality (Nussbaumer-Ochsner, Chest 2012). The current study evaluates whether AC reduces the increased rate of cardiac dysrhythmias at altitude. Methods: 43 OSA patients living at <600m discontinued CPAP 3 days before baseline examination at 490m and during 2 altitude sojourns at 1860-2590m for 3 days each, one on AC 2x250mg/d, the other on placebo, according to a randomized cross-over design. Holter ECG and polysomnography were performed at 490m and at altitude. Results: At altitude on placebo, heart rate was higher and dysrhythmias were more prevalent than at 490m. AC reduced bradycardia events, apneas/hypopneas and improved oxygen saturation [table]. Conclusions: The increased heart rate and the higher prevalence of dysrhythmias at altitude are consistent with increased sympathetic tone associated with hypoxemia. AC reduces bradycardia events at altitude, possibly by improving sleep disordered breathing.

Dysrhythmias, oxygen saturation and breathing disturbances

	490m	Altitude, placebo	Altitude, AC
Heart rate, 1/min.	67 (60;76)	75 (68;83)∗	73 (67;81)∗
Bradycardia events, 1/d	0 (0;14)	3 (0;178)	0 (0;17)§
Ventricular extrabeats, 1/d	24 (0;163)	31 (4;428)∗	26 (4;291)∗

Afib & supraventricular runs, 1/d	0 (0;0)	0 (0;1)∗	0 (0;2)
Nocturnal oxygen saturation, %	93 (92;94)	87 (86;89)∗	89 (87;91)∗§
Apnea/hypopnea index, 1/h	51 (42;73)	70 (56;89)∗	54 (46;63)§

Medians (quartiles), n=43. Bradycardia events=heart rate <50/min. for >4 beats. Afib=atrial fibrillation. ∗ P<0.05 vs. 490m, § P<0.05 vs. placebo.

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