



HIGH ALTITUDE PULMONARY EDEMA POST-TOOTH EXTRACTION

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ABSTRACT

High altitude pulmonary edema (HAPE) is a life threatening condition occurring 2-4 days after entry in areas with heights above 8000 ft, characterised by abnormal pulmonary vascular response to hypoxia. Pre-existing respiratory infection is believed to increase inflammatory mediators which prime the pulmonary endothelium leading to HAPE. Dental caries as well as tooth extraction are known to increase levels of inflammatory mediators. The effect of the inflammatory response to dental caries and tooth extraction on risk towards HAPE still needs to be assessed. In the present case the patient also had other known risk factors like cold exposure and upper respiratory tract infection. Here we are reporting a rare case of HAPE after tooth extraction.

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INTRODUCTION

High altitude pulmonary edema is a life threatening condition occurring 2-4 days after entry in areas with heights above 8000 ft. The condition is characterised by abnormal pulmonary vascular response to hypoxia in the form of non-uniform vasoconstriction in poorly ventilated regions of the lung diverting blood to the better ventilated areas leading to stress failure in these areas manifesting as alveolar edema.1 The risk factors of HAPE are faster ascent rate, greater altitude of stay, and previous history of HAPE, male gender, concomitant upper respiratory tract infections, cold exposure and physical exertion after entry in high altitude.2-6 Of all the risk factors one report describes HAPE associated with tooth infection.7 We describe a case of HAPE which occurred at our hospital located at 11,500 ft after tooth infection.

Case summary

26 year male presented with history of cough, breathlessness at rest, right-sided chest pain since last two days. Patient reported of not having slept the whole night prior to admission due to cough and breathlessness. Examination at our hospital located at 11,500 ft revealed temperature of 98° F, pulse-98/min, blood pressure-140/100 mm of Hg, respiratory rate: 30/min, oxygen saturation 50% on room air, oxygen saturation 86% with oxygen. Chest examination revealed crepts in bilateral infra-scapular and axillary regions. Investigations revealed haemoglobin of 15.2 gm%, total leukocyte count of 8400 cells/mm3.

Chest radiograph showed interstitial infiltrates in bilateral middle and lower zones and alveolar infiltrates in left middle zone. Patient was diagnosed as HAPE and managed with oxygen inhalation and bed rest. Detailed history revealed that patient had toothache and underwent tooth extraction prior to these symptoms. During dental visit, his chest was clear and oxygen saturation on room air was 94% on room air. After oxygen and bed rest, patient showed complete clinical and radiological recovery in three days.

Patient was a participant in a randomised controlled trial to evaluate effectiveness of Ibuprofen in prevention of acute mountain sickness. Patient was part of Ibuprofen arm of the study and was administered Tab Ibuprofen 600 mg thrice a day one day prior entry and continued till three days after entry in high altitude. Medication for prophylaxis was stopped one day prior to medication. Patient was monitored for vitals twice a day for first two days and once a day from third day onwards till admission (Table-1). He was exposed to windy conditions with ambient temperatures of 3 to 18 degrees Celsius. Patient was a resident of an area located at 4200 feet and was staying at an altitude of ~11000 ft since the past one year. He had returned to high altitude after an absence of 60 days. Patient had entered high altitude and acclimatised successfully on one occasion prior to the current entry in high altitude.

Table 1 Vital parameters of the patient

Table with 6 columns: Parameters, Day-1 (e), Day-2 (m), Day-2 (e), Day-3, Day-4. Rows include Pulse, BP, RR, SpO2, LLQ.

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## DISCUSSION

High altitude pulmonary edema is a potentially life-threatening form of non-cardiogenic edema occurring commonly above altitudes of 9000 ft.<sup>1</sup> Previous history of HAPE, male gender, cold ambient temperatures, faster rate of ascent, altitude, intense exercise and pre-existing respiratory infection are risk factors for HAPE.<sup>2-10</sup> Cold exposure at high altitude leading to upper respiratory tract infection is a common occurrence. Pre-existing respiratory illness is believed to contribute to risk of HAPE by increasing levels of inflammatory mediators which prime the pulmonary endothelium leading to HAPE.<sup>11,12</sup> The process is believed to render the pulmonary endothelium more susceptible to leak in response to mechanical stresses associated with physiological vascular response to high altitude. Dental caries as well as tooth extraction are known to increase levels of inflammatory mediators.<sup>13</sup> Dental procedures are known to cause bacteremia.<sup>13</sup> The immune response to these bacteria leads to generation of immune complexes which have the potential to generate acute inflammatory response at the site of deposition.<sup>13</sup> The effect of the inflammatory response to dental caries and tooth extraction on risk towards HAPE still needs to be assessed. In the present case the patient also had other known risk factors like cold exposure and upper respiratory tract infection. We found only one report proposing a possibility of dental infection leading to HAPE.<sup>7</sup> The relative contribution of inflammatory processes involving dental caries and tooth extraction to risk of HAPE remains to be seen.

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