Determinants of acclimatisation in high altitude

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Dear Editor,

I read with interest the article 'Determinants of acclimatisation in high altitude'¹ and wish to congratulate the authors on their pioneering work on this pertinent topic. I have the following observations, for consideration by the authors:

1. Thirty-one cases of effects of high altitude have been reported to be admitted to the field hospital in 2008 and this has been quoted as an unusually large number. However, neither the data for hospitalisation for similar illnesses in the previous year's nor the total number of transients in the year 2008 has been provided so the incidence could be calculated and compared.
2. A re-entry (RE) individual has been defined as one entering the high altitude area (HAA) after absence of > 10 days but < 30 days. In the analysis of the hospital admission cases due to effects of HAA in the year 2008, it has been mentioned that of the 19 cases of high altitude pulmonary oedema (HAPO), 15 were RE cases, of which, nine were away for periods ranging from 10 days to 30 days. It is not understood if 15 were RE cases; then how is that only nine were away for periods of 10–30 days. Was a different criterion of re-entry being applied?
3. The rate and mode of ascent to high altitude has been implicated in the occurrence of HAA-related illnesses.² In this study, the authors have not mentioned the transients' mode of transport and rate of ascent to the altitude of transit camp, i.e. 3,142 MSL (mean sea level). Air travel to the altitude of transit camp vis-à-vis road travel might have an implication in being given extended period of acclimatisation and subsequent development of HAA-related illness. Further, the altitudes to which the RE individuals descended before re-entry is also important in being given an extended acclimatisation period and occurrence of HAA-related morbidity.² Hence, an individual, who descended to sea level during the absence period, is more likely to suffer from HAA-related illness, rather than one, who descended to a relatively higher altitude. This data, if available, will make this study even more comprehensive.
4. Pulse, blood pressure (BP) and oxygen saturation (SpO₂) have been taken as markers of adequate acclimatisation in

this study. The authors have mentioned increase in red blood cells (RBC) production and consequent rise in haemoglobin concentration (Hb%) as one of the acclimatisation responses to high altitude. If RBC count and Hb% would have been conducted as a long-term follow-up, as haematological markers of acclimatisation, it would have been interesting to study and compare the relative changes in these values for individuals, who were found to be fully acclimatised, with those who were found inadequately acclimatised. Further, the authors have mentioned 'increase in lung size' as another of the acclimatisation responses. Perhaps this could have been quantified by conducting spirometry, if available, as a physiological marker of adequacy of acclimatisation.

5. Lastly, I wish to emphasise that albeit the mainstay of treatment of HAA-related illness is urgent descent, simulated descent, in pressurised chambers such as the emergency evacuation hyperbaric chamber (EEHS),³ is an option where available and in scenarios where actual descent is not practical due to extreme weather conditions, concomitant trauma, or the tactical situation.

REFERENCES

1. Syed VS, Sharma S, Singh RP. Determinants of acclimatisation in high altitude. *MJAFI* 2010;66:261–265.
2. Young AJ, Reeves JT. Human adaptation to high terrestrial altitude. In: *Medical Aspects of Harsh Environments* Vol 2. Washington DC: Bureau of Medicine and Surgery, US Navy 2002:644–688.
3. Roach R, Stepanek J, Hackett P. Acute mountain sickness and high-altitude cerebral edema. In: *Medical Aspects of Harsh Environments* Vol 2. Washington DC: Bureau of Medicine and Surgery, US Navy 2002:760–788.

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(The authors have not replied to the above Letter to the Editor despite numerous reminders therefore the letters to editor are published without author reply.)