OCTOBER CASE DISCUSSION

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***Q**uestion 2. A patient complains of serious insomnia when he goes above 2000m. He has lived and worked at 2500m and cannot sleep very well. He now has a job at 2500-3500m for 6 months and is very concerned to find a way to deal with the insomnia. What do you think is going on and what would you advise?*

Brownie Schoene, USA
How long has he been at altitude before? Could be Cheyne-stokes respiration to which he may be particularly vulnerable, but at that altitude you'd expect it to go away with acclimatization. I'd probably try acetazolamide initially for the first week or so (125mg qds) and stop it. If it works, that would be great. If it doesn't, then I'd try some sleep med - dealers choice.

Stephen Bezrushka, USA
I would be flexible, and try and see if he has any obvious causes for the insomnia, sleep apnea, etc. If not, then if he is flexible, and can try it out, see how he does, and if problematic, leave. He could try Acetazolamide for a few days upon arrival, and see if it helps.

John Severinghaus, USA
Simple enough to try Diamox and see if it works. If not, he may need a sleep study at sea level to see if he obstructs and if so, get nasal CPAP.

Buddha Basnyat, Nepal
I would try to 125 mg diamox before supper for a couple of days and If that did not work I would try something like temazepam or even low flow oxygen if that were possible and not too cumbersome. As at regular altitudes for insomnia I would stay away from caffeine and Alcohol and try relaxation techniques.

John West, USA
Many people have insomnia at high altitude probably related, in part, to the periodic breathing. Although 2000 m is rather low for that, if does occur.

Depending on how seriously he wants to pursue this, he might consider oxygen-enriching the bedroom. We now have an oxygen-enriched room at the White Mountain Research Station facility at 3800 m and I have never slept better in my life. Plenty of oxygen and nice low density air to breathe! The oxygen concentration is increased to 24% that is equivalent to reducing the altitude by 900 m.

A double blind study showed that the oxygen enrichment greatly reduced the degree of periodic breathing. In addition the subjects who slept in the oxygen-enriched atmosphere reported that they slept better, and had a lower AMS score in the morning than when they slept in ambient air.

For each person in the room, this degree of oxygen enrichment can be obtained by

one AirSep New Life oxygen concentrator, costing about $1,200 and consuming 350 watts. The room needs to be reasonably well sealed and there should be a double door to provide a small air lock. I could give him more information if he is seriously interested.

Erik Swenson, USA
This sounds like a bad case of periodic breathing with sleep fragmentation. Both could be treated with Diamox, or even temazepam, which Dubowitz (BMJ 1998; 316:587) showed at Everest Base Camp was quite effective at improving sleep quality without surprisingly causing any deterioration in nocturnal oxygenation. Either drug could be taken for several days until he adapts to the new altitude.

James Milledge, UK
Insomnia, even at the lowish altitude of 2000 m is not uncommon. Patients frequently over-estimate the time they spend awake, tossing and turning. I would first advise the patient that, a, it is not uncommon and b, is not serious. I would encourage him that in all probability after two to three weeks at 2500 - 3500 m he will have acclimatized and the insomnia will lessen. I would explain that on arrival at altitude he might well have periodic breathing which will disturb his sleep but that at that altitude it should disappear after two or three weeks. If his arrival at altitude is abrupt, e.g. by air, I would give him some acetazolamide for the first 3-5 days. Finally, since we now know that 10 mg of temazepam improves sleep without causing desaturation from respiratory depression, I would prescribe him a 10 day course to be started if he finds the problem is severe. I would advise him not to take sleeping tablets for longer than that.

Charles Houston, USA
If this man had trouble sleeping even after living at 2500 meters it's unlikely that Diamox or any other similar drug will help - but it might be tried. I suspect some other cause should be investigated: certainly the Hypoxic ventilatory response, and cardio-pulmonary condition too. We aren't given any medical history. My vote would be against sleeping pills because they do tend to depress ventilation. Benadryl or generic might help and is not habit forming. But look for the cause first. I don't believe anything will be found, but I don't believe he should go to live at 2500 m or higher.

David Murdoch, New Zealand
I am assuming this man has no other medical history of note. Periodic breathing is the most likely cause of this person's poor sleep at high altitude, and a good clinical history should support this. This should improve with acclimatization, but until this occurs I would try acetazolamide 125-250 mg at night. If this does not work a sedative such as temazepam would be worth a try.

Tom Hornbein, USA
Smell like periodic breathing of altitude-maybe. How old is the guy? Obese? etc. In other words does he have a problem with sleep disordered breathing at sea level that might be exacerbated at altitude? Some anecdotes with an aging trekking-high altitude climbing population that SDB and altitude may not be easily miscible and Diamox might not help.

Simon Gibbs, UK
The chronic nature of his sleep problem at only moderate altitude makes me wonder if he has sleep apnoea as well as the periodic respiration induced by hypoxia. I would advise that he be questioned further and I might suggest a sleep study to make the diagnosis.

Andy Pollard, UK
The first question to answer is why the patient gets insomnia at altitude. Insomnia is not necessarily related to altitude and first both organic (sleep apnoea due to upper airway obstruction perhaps worsened by the climate at altitude) and psychological (depression, anxiety etc) should be excluded by the physician. Other environmental causes for insomnia should also be considered (uncomfortable bed, inadequate warmth etc). Other causes of insomnia, which might be worsened by the decrease in oxygen levels at altitude (such as heart and lung diseases) should be excluded by the physician.

If everything else is excluded then altitude itself could be the cause of the insomnia. However, it is unusual for someone to fail to acclimatize at such moderate altitude and I would expect any altitude related insomnia (periodic breathing due to poor acclimatization) to settle down after a week at the longest. An interested physician might be able to do a sleep study on ascent to altitude to help clarify the diagnosis.

Assuming underlying causes of insomnia have been excluded, how should altitude insomnia be treated? I am generally not in favour of using any drugs at altitude except in emergency situations. Indeed, it would be hard
to justify taking acetazolamide (diamox) or any other drug for 6 months. Its use is not usually considered necessary until ascending over this altitude anyway. My first choice would be to do nothing expecting the insomnia to settle over a week or so as the patient acclimatizes. If it does not, or it is already known that it won't, I would try to find an interested respiratory physician to help with proving that the problem is altitude related (a sleep study) and does not improve with time.

If the insomnia is proven to be altitude related and settles after a week or so, then a short course of acetazolamide may speed the process of acclimatization the next time. Some people will not tolerate the side effects of acetazolamide and it should be tested for a few days at sea level to see if it suits the patient. I would then use it for the first week at altitude only.

Sleeping pills could be considered if oximetry is normal on a sleep study but may affect the patient’s ability to work safely.

Dr. Ton Ricart, Spain
The information we have, rather limited, says nothing about this patient having insomnia at sea level. He has previously lived at altitude and again he has accepted a new job at altitude. He just complains of not sleeping very well without more serious complications, if so he has not suffered from Acute Mountain Sickness. Insomnia may express a chronic intolerance to altitude. Since he accepts to go back to altitude insomnia is probably a nuisance and not a real intolerance. I think the patient may

benefit from explanations about what's happening and usual treatment for insomnia. Therefore it should be interesting to think about:

a) Do not prescribe hypnotic drugs that may enhance the situation by decreasing ventilation and oxyhaemoglobin
b) In case we find data about previous altitude intolerance I should study hypoxia tolerance and if needed I should suggest to change the job

Gerald Dubowitz (Pheriche, Nepal)
Insomnia is a feature of Acute Mountain Sickness, AMS (Lake Louise score) it is also commonly reported during sojourns to altitude in otherwise well individuals. It is in part due to episodes of periodic breathing and desaturation. In addition it occurs because of environmental changes such as cold and discomfort.. Initially I would enquire about his trekking programme. How fast has he trekked in previously? Can he trek in more slowly to allow better acclimatization? Is the insomnia an early feature which improves or does it last the duration of the sojourn at altitude?

If we have identified a good trekking profile, but he still has symptoms; has he taken diamox? If he acclimatizes well otherwise I would initially suggest a nightly dose of diamox e.g. 125mg nocte (or less cf Peter Hackett) taken perhaps 3-4 hours before bed (to initially avoid nocturesis) assuming he has no known contraindication to taking this (e.g. sulphur allergy etc). This would be safe even if he has mild AMS (e.g. headache + one other symptom). If we are sure he is acclimatizing well and he only has insomnia and this is not a feature of poor acclimatization or AMS he can alternatively (or additionally consider taking a low dose hypnotic). I agree with Simon Gibbs a paper in the BMJ (BMJ 1998; 316:587) in February indicated a LOW dose of temazepam a (short acting) benzodiazepine hypnotic was shown to improve sleep without a detrimental effect on oxygen saturation. This contrasts previous studies using large doses of benzodiazpines and other hypnotics that were indeed detrimental to nocturnal oxygenation. The result of this study clearly indicated it (temporarily) reduced episodes of periodic respiration and marked desaturations). At this point it is important to note that this particular study done a relatively small number of individuals, none of whom scored significantly on the Lake Louise score (i.e. they did not have AMS) so there may be individuals in any given population who may react differently, especially if they have significant AMS. If a low dose does not work there is no evidence that a higher dose will be beneficial and fairly good evidence that it may in fact be detrimental.

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