

# UIAA Mountain Medical Centre Information Sheet 3

## DIAMOX, DEXAMETHASONE & NIFEDIPINE AT HIGH ALTITUDE

### Introduction

Diamox (acetazolamide) is of some value in the **prevention** of Acute Mountain Sickness (AMS). Dexamethasone (Decadron) has a place in the **treatment** of established AMS and Cerebral Oedema. Nifedipine (Adalat) is used for treating Pulmonary Oedema. I have used the names by which these drugs are commonly known in Britain.

### Diamox

Diamox, a drug often used in the treatment of the eye condition glaucoma, is also useful in the prevention of Acute Mountain Sickness (AMS). AMS occurs commonly during visits to 3000-4500m and may cause a severe headache, exhaustion and general feelings of illness. In rare cases (but sometimes even at these altitudes), the condition progresses to cause more serious problems that are potentially fatal – High Altitude Pulmonary and Cerebral Oedema (HAPE & HACE).

Diamox reduces the headache of AMS and helps the body acclimatise to the lack of oxygen - it also probably reduces the incidence of the complications of AMS mentioned above (HAPE & HACE). Whether or not one takes Diamox is obviously a matter of personal choice - travel to high altitudes is quite possible without it. I do not recommend the drug as a routine treatment, though there is variation of opinion about this many people choose to use it if travelling quickly to altitude (eg. if flying into Lhasa).

### How to take Diamox

If you decide to use the drug, I suggest Diamox 125mg (half of one tablet) is taken twice daily as a trial at sea level for two days **several weeks before** a visit to altitude. Assuming no unpleasant side effects are experienced, take the drug in the same dose for three days before staying at 3500m and thereafter for two or three days until you feel acclimatised, for about five days in all.

### Side Effects

Like all drugs, Diamox may have unwanted side effects. Tingling of the fingers, face and feet is the commonest, but this is not a reason for stopping the drug unless the symptoms are intolerable. Dizziness, vomiting, drowsiness, confusion, rashes and more serious allergic reactions have all been reported but are unusual. In exceptional cases, the drug has caused more serious problems with blood formation and/or the kidneys. Those who are allergic to the sulphonamide antibiotics may also be allergic to Diamox.

More commonly, the drug makes many people (including me!) feel a little "off colour"; carbonated drinks and beer also taste strange when you are taking Diamox.

### Dexamethasone for established AMS

The potent steroid dexamethasone (Decadron) has an important place in the treatment of AMS - I usually suggest it when someone has an incapacitating headache.

### Dexamethasone for cerebral oedema.

Dexamethasone is also used in the treatment of the life threatening complication of AMS, cerebral oedema, which is due to fluid collecting within the brain. Victims develop headaches become irrational, drowsy and confused over a period of hours - their walking also becomes unsteady. Double vision may occur, and they may vomit and experience nausea. A simple test for HACE is to see if someone can walk heel to toe.

### **How to take dexamethasone**

Take dexamethasone 8mg as tablets (usually 2mg size) initially followed by 4mg every 6hrs. Treatment would normally only last for one day, i.e. a total of 20mg in one day.

If AMS symptoms (headaches) persist, you should certainly not ascend further, descend if you can and seek medical advice immediately if available. You can continue to take dexamethasone for a second day but it is unlikely to help - it usually works within around 8 hours. If cerebral oedema is suspected descent is essential, and oxygen by mask or a PAC chamber should be used if available.

### **Precautions and unwanted effects**

Like all drugs, dexamethasone may have unwanted effects, but in these very short courses the problems are normally few. However, the following may occur:

*Peptic ulceration* - If you have indigestion or are known to have had an ulcer, a medical opinion is usually advisable before taking dexamethasone, as steroids can sometimes cause sudden (occasionally severe) gastric bleeding.

*Mood changes* - Steroid drugs sometimes increase excitability and may make one feel 'high' or confused, but the risk of this is small.

### **Nifedipine in pulmonary oedema**

Nifedipine (Adalat), a drug used for angina and high blood pressure, has an important role in the treatment HAPE. If the condition is diagnosed (symptoms are breathlessness and crackly or bubbling chest noise) you should evacuate the victim to low altitude, giving oxygen by mask and using a PAC chamber if available. Give nifedipine 20 mg by mouth immediately and nifedipine 20mg every 6 hours for one day – slow release capsules are the usual form of the drug. Side effects can include a sudden drop in blood pressure or faintness (lie down!), but if the diagnosis is in doubt treatment should be given anyway, as it is unlikely to cause anyone much harm.

### **Undiagnosed serious illness at altitude**

It may be very difficult to diagnose what exactly is wrong when someone is gravely ill at altitude. The above two treatments (dexamethasone and nifedipine) can be given simultaneously, and in my view all climbers should carry these drugs in a small first aid kit - in the context of high altitude climbing, they can be used without medical supervision.

In Britain, these drugs are sold only on a doctor's prescription: since they would be used for foreign travel a private prescription would usually be given.

### **Suggested Prescriptions**

Some physicians may be uncertain about prescribing these drugs for altitude-related illnesses, if so the following guidelines may be helpful:

Acetazolamide - 125mg (half of one tablet), twice daily for five days and re-start treatment if symptoms return.

Dexamethasone (2mg tablets) - 8mg at once & 4mg six hourly for 24 hours (12 x 2mg tablets).

Nifedipine (20mg tablets) - one six hourly for 24 hours (7 x 20mg tablets).

**NOTE:** Anyone taking these medications should be aware of potential unwanted side effects, written details of which should be supplied by the dispensing pharmacist.

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