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# Managing Hypertension in a Hill-farming area of Darjeeling

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The Karmi farm clinic is a privately run and funded clinic at a home stay (www.karmifarm.com), situated North West of Darjeeling at about 1500 metres above sea level. Prior to the clinic opening in 2002 the nearest hospital had limited resources. It was often difficult for local people to access for reasons of cost and poor transportation. The main hospital at Darjeeling is 4 hours away by jeep which effectively results in an overnight stay for the patient and a relative, plus any costs involved. These are often too great for subsistence hill farmers in terms of money and time. The Karmi clinic is sponsored by Nomad Medical and the staffing consists of a locally trained, paid health worker/translator together with a range of UK based health professionals who visit the clinic for longer periods of time. These health professionals have included doctors, midwives, nurses, physiotherapists and pharmacists as well as alternative therapists. However, during some periods such as the monsoon season, the clinic is regularly only manned by the health worker. The clinic is able to provide a range of services including general health advice, wound management, treatment of acute minor ailments, management of chronic conditions such as hypertension and diabetes, minor injury and as a referral centre for the major hospital in Darjeeling town. Importantly, the clinic supplies at low cost, or in some cases free of charge, medication obtained through a reliable supplier. This article describes some of the issues facing practitioners in the management of a chronic condition such as hypertension and the difficulty of applying those protocols designed for the UK population.

**Demographics of the population and hypertension**

Those attending the clinic are largely within walking distance of 1- 2 hours from a rural community, where there has been no official census of population size, but it is believed to be approximately 3,000. The population consists of predominantly subsistence hillside farmers, many of Nepalese origin. They have very limited resources since the cash crop of cardamoms has failed several years in a row due to diseased plants. A regular observation of health professionals working at the clinic, was the perceived high levels of hypertension and the quantities of hypertensive medication needed, to attempt to manage the condition in the local population. This was in the light of the absence of risk factors usually associated with hypertension e.g . obesity and low levels of exercise.

**Audit of Clinic records**

Since 2007 a record has been kept of all those visiting that have been prescribed anti-hypertensive therapy. These records were audited for the years 2008/2009. 40 patients were audited. The mean age of the patients was 62.5 years (10.7 SD), 64.6 years for males ( n=21, 8.2 SD) and 59.6 for females (n =19, 12.6 SD). The age difference was not significant (P=0.15, t test). The details regarding treatment were noted and are summarised in table 1.

**Table 1**
**Audit of patients receiving antihypertensive therapy**

| | Number (%) |
|---|---|
| Thiazide | 3 (7.5) |
| Atenolol | 20 (50) |
| Amlodipine | 7 (17.5) |
| Enalapril | 16 (40) |
| Combinbation therapy | 8 (15) |

There are a number of potential inaccuracies associated with these figurers:

- Record keeping may be inconsistent due to the large number of individuals involved in manning the clinic
- Ages are likely to be inaccurate as there is no official recording of birth dates
- Patients having similar names are likely to be recorded twice

**Discussion**

It is difficult to conclude whether hypertension is a particular problem in this area without information on the true population demographics. Apart from this there are a number of issues concerned with defining a potential problem and managing the condition as discussed below. The family history of the condition is largely unknown and in most cases there has been no screening to identify possible secondary causes of hypertension such as renal disease. Further, it is uncertain to what degree hypertension may ontribute to any long term complications such as stroke or renal damage in this population. The blood pressure norms in this population have not been identified and hypertension has been defined by western parameters. There may not be the same relationship between development of complications and a history of hypertension as exists in the UK. Optimal treatment for the population has not been studied so again, the condition has been managed broadly according to western algorithms. However, it was noted that a high proportion were prescribed beta-blockers, although these are no longer recommended as first line management according to UK guidelines.[1] This must be balanced against the consideration of using ACE inhibitors without reliable and regular blood screening. When a health professional is not available in some cases the local health worker has had to make decisions regarding dosage adjustment or occasionally initiating therapy. It is difficult to systematically review patients on long term medication, given the periods of time when no health professional is present. Patients will also obtain repeat supplies from sources outside the clinic which may be of variable quality. It was reported that the local milkman was a source of cheap medication. Adherence is also an issue, when obtaining supplies might be difficult due to cost or transportation. If some of the usual risk factors associated with developing hypertension are not applicable to this population, there may be others that need to be identified. For instance, although the diet is vegetarian and low fat, salt does appear to be used quite liberally. Alcohol consumption of a local weak beer (Chang) is high. Also consumed in large quantities is a home distilled spirit (Rakshi), although analysis has shown this to be around just 13% alcohol. Farm workers do not tend to have access to water supplies for most of the day and fluid consumption may be inadequate. Issues during pregnancy related to hypertension are not known. It is possible that minerals from glacial waters may contribute to the incidence of hypertension. For instance, there is an association with chronic arsenic poisoning from drinking water contaminated with naturally occurring arsenic and this has been reported in Bangladesh.[2]

**Conclusion and future work**

This article describes some important considerations when attempting to manage chronic conditions in non-western remote communities. UK protocols and systems of management may not necessarily be applicable and should be adapted carefully to local need. Thought should be given to the value of treating moderate to mild cases of hypertension in the clinic, until it is practical to properly monitor prescribed medication and ensure a regular and reliable supply. To make this judgement the following needs further
consideration:

- Definition of the population, blood pressure distribution and level warranting treatment
- Investigation of the outcome of long term antihypertensive therapy and what may be optimal in the population
- Identify the dietary factors and secondary causes that may contribute to the incidence of hypertension
- How to institute a system of accurate record keeping and follow up

References:
1 Clinical guideline 34: 'Hypertension: management of hypertension in adults in primary care: partial update
www.nice.org.uk/CG034guidance
2 Rahman Mahfuzar. Arsenic and hypertension in Bangladesh. *Bulletin of the World Health Organization* 2002; 80(2): 173-173

*If you are interested in volunteering to work on Karmi farm send an email to .Cathy@nomadtravel.co.uk*

Karmi farm clinic and local health worker Photo – Paul Goodyer

*Karmi farm Photo – Paul Goodyer*

*Inside the clinic* *Photo – Paul Goodyer*