

SOME EXPERIENCE WITH PARAPLEGIA IN A SMALL HOSPITAL IN NEPAL

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With Extracts from an Essay

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Key Word: Paraplegia in Nepal.

Introduction

NEPAL is a mountainous country with very few roads. Distances are measured in time. Patients may walk or be carried for 10 to 12 days to attend hospital, and for some months of the year swollen rivers may make their attendance impossible. There are a small number of hospitals and dispensaries, not all equipped with X-ray or anaesthetic facilities, and drugs are in very limited supply. This is an account by a physician, self-taught and inexperienced in the care of paraplegia, working in a small British Military Hospital which made its surplus capacity (after the care of Gurkha soldiers and depot staff) available to anyone who came to the gates. Except for the occasional case of lathyrism the material is almost certainly similar to that in most developing countries, in nearly all of which paraplegia will be a serious problem, from the point of view of the general physician probably the most important problem after malnutrition, tuberculosis and alcoholism.

Material

Though cases of paraplegia will constitute perhaps only $\frac{1}{2}$ per cent of the outpatient material, they differ qualitatively from the other cases. The management of leprosy, malaria and amoebiasis is simple and treatment is quickly effective. Paraplegia is different. Of ominous prognosis: their care dreaded by nursing staff and relatives alike, often with numerous sores; fever from urinary infection; incontinent of faeces and urine; their working and earning ability removed; their admission sometimes regarded as wasteful of resources, these are the sick most to be pitied in the developing world today. Their demand on one's human feelings is irresistible. Since a very great deal can be done for them, however limited resources are, it is essential for the physician working in a developing country to know what to do. The author recalls a middle-aged man staggering into his consulting room. His hands were behind his neck and he held his elderly mother by her wrists and she hung down his back. He had climbed across the Himalayan foothills for a week with her held in this way. Most patients came carried on someone's back or slung on a bamboo pole between two men. One young man carried his father to the hospital holding him under the armpits with his hands gripping each other in front of his father's chest. His father meanwhile lifted his own paralysed legs off the ground with his normal arms. A quadriplegic, breathing apparently mainly with his sternomastoids following a cervical injury, travelled

sitting upright between two friends in a native bus over a very bumpy road. Many had had paraplegia for months and had enormous sores over both greater trochanters with dead muscle bellies and eroded bone. One such lady died in the hospital compound while she was waiting to be seen.

Methods

If these patients are told that there is nothing to be done to help them, the opinion will be sadly and politely accepted, the party will turn round and return home and the gospel of the hopelessness of paraplegia is spread. If they are admitted to a hospital with enthusiasm for treating paraplegia, however limited its resources, they will all be benefited to some degree and in most cases dramatically so. They will be discharged with a knowledge of how to look after themselves. Male medical assistants under training are very good with these patients. It is an advantage to have several paraplegics in the same ward. They soon become very cheerful and, need it be said, grateful. Paraplegia is very common in developing countries and a terrible condition for the patient and his family. Opposition to admission of paraplegics springs from the philosophy that there is little place for curative medicine in developing countries, that resources should go to prevention, and that these cases are wasteful. This is rubbish. Carried to its logical extreme it would deny treatment to a child with a fractured femur.

What is essential is to use resources as sparingly and profitably as possible. The care of these paraplegic patients involves relatively inexpensive investigation and treatment in most cases at first, and thereafter depends on what can be taught. Neurosurgery is rarely necessary, if possible at all. Staff drawing low salaries are easily trained to a high degree of skill. The patient is trained and his relatives can be. Expensive equipment, *e.g.* high quality wheel-chairs, is relatively useless where there are no roads and poor paths, no spare parts or maintenance service. Strong parallel bars for exercise, and railing to give support, can be made by villagers out of bamboo. Home-made wheelchairs based on bicycle wheels can be made, the wheels being the main expense. (Intermediate Technology Group, 9 King Street, London WC2, Tel. 01-836 9434, will provide for a few pence, designs and constructional drawings for making wheelchairs and paraplegic turning-frames as well as much other hospital equipment.)

Aetiology

Potts Disease is the most common aetiology; next a miscellaneous, rather obscure group including lathyrism, transverse and ascending myelitis, tropical spastic paraplegia (South Indian paraplegia), and arachnoiditis; and finally, trauma is common—usually the result of falls from trees while in search of leaves for fodder.

Potts Disease

In the very best centres, and where the surgeon has a particular interest in the subject, there is a small benefit from surgery at considerable cost in resources. There is no place for the occasional spinal surgeon in Potts Disease. Results are good with drugs and bad results can often be due to drug default. Surgeons are particularly tempted by sinuses. These nearly all heal in the end on drugs alone and if operated on generally recur. The backbone of treatment in Potts Disease

in the small hospital is the avoidance of drug default and the maintenance of staff and patient morale.

Case 1. Male Nepalese aged 28. Deformed spine for many years, paraplegia for over a year and bladder involvement for a month. The patient lived 10-12 days' trek away and was carried in by his friends. There were massive bed sores over both greater trochanters with large erosions of bone. X-ray revealed dorso-lumbar Potts Disease. After 3 months in hospital on Streptomycin, PAS and INAH there was considerable healing of the sores but no neurological change was detected. During the next month bladder function returned and catheters were dispensed with; soon afterwards sensation returned and the beginnings of voluntary movement. After 5 months in hospital he was walking with sticks and knee splints, with his sores healed. His friends had been sent for and they escorted him home with 18 months' supply of Thiazina. The effect of this case on the medical assistants, the trained nursing staff and on other paraplegics was all that could be hoped for. In particular, the physiotherapy department felt their professional status elevated. It became possible to admit any paraplegics when necessary and the nursing staff were pleased to care for them. At the time this patient was admitted there was some slight depression when paraplegics came in.

Lathyrism

This is a spastic paraplegia with very marked spasticity, very brisk clonus and reflexes without sensory loss or bladder involvement. The legs are much more involved than the arms. Lathyrism is due to eating the pulse *Lathyrus sativa* (Khesari dhal). This pulse, grown in many areas of the world, is most nutritious and a good source of calories, proteins and B complex vitamins; it will grow well in areas of low rainfall and poor soil. In some areas of Nepal and North India a large proportion of the population are very dependent on it. The toxin has been identified and can largely be removed by soaking in warm water for some hours and throwing away the water. India's expert Green Revolutionaries are, it is understood, trying to breed Khesari dhal of low toxicity.

Case 2. An elderly Nepalese appeared, supported by his two sons. He had a very spastic paraplegia with no sensory loss or bladder involvement. He admitted to eating Khesari dhal (*Lathyrus sativa*) in quantity; 1 mg of vitamin B₁₂ was injected. He was instructed to eat no more Khesari dhal which he said he could manage to do. Two weeks later he stated that he had walked for the first time for over a year. After a further 2 weeks he was obviously better.

Paraplegia of Obscure Cause

This is common enough in Nepal as it is no doubt everywhere; a spastic paraplegia—generally of slow onset—involving usually one leg before the other, sometimes with sensory change and occasional bladder difficulty. In Africa such cases may be due to syphilis or to bilharzia. I saw no syphilitic cases but I treated all obscure paraplegia with 10 days' Penicillin. Autopsies are very rarely obtainable but posterolateral softening has been described. Substantial recovery is not to be expected, but in my experience these cases were no exception to the rule that in most cases of paraplegia in tropical practice improvement occurs soon after admission to hospital. As well as Penicillin all cases of this sort were treated with a short course of steroids and a routine course of anti-tuberculous drugs. It is well-known that multiple sclerosis is virtually unknown in the tropics, neuro-myelitis optica being commoner, but I saw no cases of either as far as I could tell. A myelogram was done if spinal compression seemed likely.

Many chapters in Spillane's *Tropical Neurology* contain accounts of these cases. Mani's chapter on 'Neurological Disease in South India' is particularly useful. Of 249 cases seen in his clinic in a 5-year period, there were some 48 of this type, 50 tumours, and 24 cases of arachnoiditis, but only 15 cases of Potts Disease and seven traumatic cases, indicating very clearly that the series was very selective. Mani found serum B12 levels to be lower in both these cases, and in control paraplegics generally, than in normal controls. Folate, nicotinic acid and ascorbic acid levels were normal. In the tropics generally, folic acid levels tend to be normal especially in regions with a high vegetable intake and where overcooking is not practised. Investigations were thorough, comprehensive, and produced no clues as to the cause. The low B12 levels seem likely to be secondary to poverty or ill health. I gave both intramuscular B12 and a generous Nepalese diet to all paraplegics.

Case 3. Male Nepalese, aged 7, able to walk a little but with a spastic weakness of both legs with bilateral foot drop, extensor plantar responses and no sensory loss. Not a Khesari dhal eater. The condition had come on over some years, starting in the right leg. Cerebrospinal fluid, X-rays chest and spine and cisternal myelogram were all normal. Hb 14G per cent, ESR 7, VDRL negative. Admitted for 10 days and treated with physiotherapy and 1 mg B12 IM daily for 3 days. Bed-state pressure necessitated his discharge after 10 days, during which time his foot drop and walking improved a little. He never attended for follow-up assessment. Had he come later in my time, he would have been treated with INAH at least and, somehow, kept for rather longer to produce more substantial improvement if obtainable, and certainly better motivation.

Arachnoiditis

This is a chronic or subacute spinal meningitis which is perhaps both commoner and more often due to tuberculosis in developing countries than in the West. The condition may be localised or extensive. The sub-arachnoid space may be obliterated or contain dense exudate, xanthochromic jelly, or yellow or clear C.S.F. generally with high protein level. Lumbar puncture often yields a yellow fluid or a dry tap. A cisternal myelogram in the latter case will show a spotty filling, candle gutter appearance—a variety of irregularities. The myelographic appearances of angioma may be similar and a tumour or cord compressing lesion may produce arachnoiditis. Syphilis, tuberculosis, cryptococcosis and local parasites should be considered as possible causes. The clinical features are described in Wadia's excellent chapter in Spillane's *Tropical Neurology* as being subacute or chronic. The former have a sudden onset, often with fever, and may present as acute transverse or ascending, or mixed root and cord syndromes. Untreated, this may progress to tuberculous basal meningitis. All cases of arachnoiditis in developing countries, therefore, should have a full course of anti-tuberculous drugs.

Case 4. Male Nepalese, aged 24. After a few days' fever he developed flaccid paralysis of the legs with retention of urine and loss of sensation. Dry lumbar puncture tap in three places. Cisternal myelography showed spotty, irregular filling and candle gutter appearance. He was in hospital some 8½ months, at the end of which time his sores had not quite healed, he had a small amount of knee and foot extension, he had very severe para-articular ossifications of the hips and had obvious leprosy, his bladder function was manageable generally without catheter but occasionally requiring it. Whilst in hospital he was treated at first with steroids, throughout with anti-tuberculous drugs—at various times

Streptomycin, INAH, Rifampicin, Ethambutol and Thiacetasonone—and one dose 50 mg each Streptomycin and Hydrocortisone into the arachnoiditis region. The leprosy manifested itself as characteristic serpiginous borderline lepromatous leprosy, and this eruption was clearly a type I lepra reaction associated with Rifampicin as I have often seen. It was confirmed histologically. His time in hospital was complicated by an attack of pulmonary oedema, repeated urinary infections and drug sensitivity skin reactions. He was discharged on Thiacetasonone, INAH, Clofazamine and Dapsone. When seen some 3 months later he had a new large sacral sore and had a catheter *in situ*. A locally made wheelchair was obtained for him. Masalawala (1975) has described the danger of too enthusiastic passive movements in producing para-articular ossification. The intrathecal therapy was probably ill-advised and the anti-tuberculous regime unnecessarily extravagant. He probably required more experienced management of his urinary problems. The natural course in most cases of arachnoiditis in India seems to be generally better than this.

Management in Hospital

Towards the end of my time this was as follows:

Drugs

Nearly all cases, unless a clear non-tuberculous aetiology was established, were treated with a full course of anti-tuberculous drugs. Using Streptomycin, Thiacetasonone and INAH, this costs very little—perhaps £10 in all; if only Thiacetasonone and INAH were used for 18 months, about £2. All acute or subacute obscure cases received a 2-week course of steroids and a penicillin regime suitable for syphilis. All cases were given 1 or 2 mg of vitamin B₁₂ IM, lavish vitamin supplementation especially with Thiamine and Nicotinamide (300 mg daily each at first) and a very generous Nepalese diet. Low levels of vitamin B₁₂ are common in paraplegics in the tropics but the evidence is that B₁₂ deficiency is not directly causative.

Sores

All patients with big pressure sores were bathed in a large hospital bath every day. The sores were washed and dead muscle, pus etc. drifted off. It seemed useful to dry the worst sores afterwards with infra-red. The patients were nursed mainly on their abdomens. Where necessary the arrangement of pillows and packs taught in Stoke Mandeville was used. A variety of dressings were used—on the whole the less specific dressing, the better seemed the results. In the tropics wounds and sores are best kept free of maggots.

Physiotherapy

We were fortunate in having two very energetic and experienced Nepalese physiotherapists. One must be cautious not to produce para-articular ossification but at the same time to be enthusiastic.

Bladders

Bladder function returned very often in the first few days after admission. In other patients, intermittent catheterisation was used for a few days and then an indwelling catheter. Urinary infections occurred occasionally but were usually

manageable. Long-term Septrin or Nitrofurantoin was sometimes prophylactically used. Pauls' tubing was used on cases of incontinence. I would advise all physicians going to work in the third world to acquire more knowledge of this subject than I possessed.

After-care and Follow-up

There were some almost unbelievable defaulters. Patients responding well to anti-tuberculous drugs would default, reappear, respond again a little, default again. Prolonged in-patient treatment or fully supervised out-patient treatment are the answers and, above all, explanation to and motivation of the patient are well worth the time involved. This, like any other requirement for sophisticated administration in developing countries, is perhaps the most difficult of all aspects of paraplegic care.

SUMMARY

Paraplegia is a common problem in developing countries. They are the most pitiable group of cases seen, but they can all be offered some help, however limited one's resources. The main causes are Potts Disease, arachnoiditis, tropical spastic paraplegia, trauma, lathyrism and cord compression. The usual trauma is falling from trees and the use of trained monkeys to gather leaves and nuts whilst humorous should not be dismissed. The author saw some 35 cases of paraplegia, of which four are described—two good results and two bad.

The physician going to a developing country is advised to prepare himself for the care of these cases and to be prepared to motivate staff, patients and relatives. He will find local medical assistants are kind and enthusiastic and rapidly acquire the necessary skills. Nearly all cases should receive a simple and inexpensive anti-tuberculous regime, vitamins and a very generous diet. Necessary equipment required for the home should be locally made and nothing requiring more than simple maintenance should be used.

RÉSUMÉ

La paraplégie est un problème commun dans les pays en voie de développement. C'est un groupe de cas des plus pitoyables que j'aie vus, mais ils peuvent tous recevoir un peu d'aide, même si les ressources sont restreintes. Les causes principales sont le mal de Pott, l'arachnoïdite et la paraplégie spasmodique tropicale, le trauma, le lathyrisme et la compression du cordon médullaire.

Le trauma qui est le plus commun c'est de tomber des arbres. L'emploi de singes dressés à cueillir des feuilles et des noix, bien que comique, n'est donc pas à abandonner.

L'auteur a vu à peu près 35 cas de la paraplégie dont 4 sont décrits—deux avec de bons résultats—deux avec de mauvais.

Le médecin qui voyage dans un pays qui se développe, est avisé de se préparer pour le soin de ces cas, et d'être prêt à motiver le service de santé, les malades et la parenté. Il trouvera que les assistants de médecine de la région sont bienveillants et enthousiastes et qu'ils acquièrent très vite les talents nécessaires.

Presque chaque cas devrait recevoir un régime antituberculeux qui est à la fois simple et bon marché, des vitamines ainsi qu'une alimentation très généreuse.

L'appareillage nécessaire pour la demeure devrait être fabriqué dans la localité, et seulement ce qui exige de simples maintiens devrait être utilisé.

ZUSAMMENFASSUNG

Paraplegie ist ein häufiges Problem in Entwicklungsländern. Diese sind die erbärmlichste Gruppe unter den meisten Kranken, die ich gesehen habe, aber sie können alle Hilfe bekommen trotz der beschränkten Möglichkeiten.

Die Hauptursachen sind Wirbeltuberkulose, Arachnoiditis, spasmodische tropische Paraplegie, Verletzungen, Lathyrism und Kompression des Rückenmarks. Die übliche Verletzung ist Fall von Bäumen und dar Gebrauch von trainierten Affen, sollte nicht unterlassen werden, um Blätter und Nüsse zu sammeln.

Der Autor hat circa 35 Krankenfälle von Paraplegie gesehen—4 sind davon beschrieben worden, 2 mit guten Resultaten und 2 mit schlechten.

Der Internist, der in einem Entwicklungsland arbeitet, soll sich für die Behandlung dieser Fälle vorbereiten. Er soll auch bereit sein, Personal, Patienten und Verwandte zu motivieren. Er wird finden, dass örtliche Medizinische Assistenten sehr freundlich und begeistert sind, und sie werden sehr schnell die notwendige Geschicklichkeit erwerben. Fast alle Krankenfälle sollten eine einfaches und billiges anti-tuberculose Regime sowie Vitaminen und auch eine sehr reichliche Diät erhalten. Notwendige örtliche Einrichtungen sollten gebaut werden, die nichts anders als einfache Unterhaltung erfordern.

REFERENCES

- GUTTMANN, Sir LUDWIG (1976). *Spinal Cord Injuries. Comprehensive Management and Research*. 2nd edition. Blackwell Scientific Publications, Oxford.
- HUCKSTEP, R. L. *Poliomyelitis (A Guide for Developing Countries)*.
- MASALAWALA, K. S. (1975). Experiences with traumatic paraplegia patients in India. *Paraplegia*, 13, 29-35.
- RAI, TIKARAM (1977). *The Cord*, 29, 2.
- SPILLANE, J. D. (1973). *Tropical Neurology*.

Extracts from an Essay on

THE HOME AND HOSPITAL NURSING CARE OF THE CHRONIC PARAPLEGIC PATIENT IN NEPAL

By TIKARAM RAI

'KATAI BAREE!' (Oh dear me!), exclaims Mrs Maita, 'however can he make such a journey over these evil mountains, when he can't even get outside his own back door?'

'He will have to be carried, of course', replies Lal. 'You must try to arrange it. Surely you can find several strong young fellows to help you get him to hospital.'

'Brother', says Harka, 'there are such a few strong men left in the village, since almost all are away in some kind of "Service", that at this time of the year no one will agree to go. When the ploughing and field preparation is over in a month's time, we could perhaps arrange something.'

Lal looked at the verandah (downstairs) and decided he would try to prepare as comfortable as possible a bed for him there. So with the family's cooperation he collected several easily washed soft cotton 'shawls' for sheets, a new straw mat, 'rahri', *i.e.* locally woven blanket (from raw sheep's wool), two long-haired goat skins and three locally made pillows. He arranged these on the hard floor of the verandah (no bed-boards necessary!) but before moving the patient to his new bed, he gave him a thorough bath. The area over his sacrum was so red and sore that the skin was about to break down.

'Now', thought Lal, 'one of the biggest problems of keeping him here for a month is how to prevent pressure sores—and bad ones indeed.'

Now Lal turned his attention to the problem of his patient's incontinence. Very ingeniously and taking much trouble, he hollowed out a suitable piece of