TUBERCULOSIS AMONG THE GURKHAS AND THEIR DEPENDANTS*
SERVING WITH THE UNITED KINGDOM FORCES IN THE FAR EAST

BY
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The Gurkhas serve in Malaya, Singapore and Hong Kong (FARELF). Wherever in FARELF the Gurkhas are found to have tuberculosis, steps are taken immediately to have them admitted to the Gurkha Sanatorium (100 beds) in the British Military Hospital, Kinrara, some nine miles from Kuala Lumpur, the capital of Malaya.

The Gurkha recruit

Provided the Gurkha is physically fit and fulfills the required standards, and that always includes a normal chest radiograph, he is accepted for service. The Heaf test is carried out in every case. All negative reactors have B.C.G. vaccination. Careful documentation is carried out in all cases. After the Heaf test becomes positive all such cases have an annual Heaf test and radiograph of the chest for the next five years.

Recruits who have a normal radiograph of the chest and a positive Heaf test on first acceptance for service have a radiograph of the chest every three years, provided, of course, they do not subsequently become contacts of cases of notifiable tuberculosis, when other arrangements, to be mentioned later, are followed.

The Gurkha soldier

Every three years of completed service the Gurkhas have six months’ leave in Nepal. Radiographs of the chest are taken immediately before and on return from this leave.

Gurkha infants and children

All Gurkha infants and children aged three years and under who have a positive Heaf test, in the absence of evidence of active disease, radiological or otherwise, are given routine anti-bacterial drug therapy for tuberculosis.

Notification

On the diagnosis of tuberculosis being established, all cases are notified in writing to the unit concerned, the medical directorate and the civil authority. However, in order to get action with the minimum of delay a signal is sent to

the unit concerned notifying the case and requesting immediate "contact action" (see below). A copy of this signal is sent to: (a) the D.D.M.S. (or equivalent) for the information of the A.D.A.H., who keeps a central register of all cases of tuberculosis; and (b) the Colonel, the Brigade of Gurkhas.

Contacts

A contact may be defined as a person who has been living, working or otherwise associating intimately with a person who has notifiable tuberculosis. Where there is a case of tuberculosis, all individuals in the same household, in the same regimental (or pipe) band, or who work in the same office or classroom, or sleep in the same barrack room, hut, tent or bivouac, share the same jungle patrol, or eat at the same table are examined to discover the source of the infection.

The unit medical officer immediately takes action to trace all contacts as defined above and gets in touch with the nearest British Military Hospital. Frequently within twenty-four hours of receipt of the signal of notification, contacts report for a chest radiograph.

Those contacts with a normal chest radiograph also have a Heaf test carried out and have chest radiographs repeated every three months for two years, six-monthly for the next two years, and then at the end of the fifth year after contact. All such contacts are carefully documented. The dates and results of each chest radiograph are sent to the A.D.A.H. for his central contact register.

Civilians employed with the Brigade of Gurkhas

All such civilians have routine M.M.R. by the Army Mobile M.M.R. teams. All cases of tuberculosis, so-called quiescent disease or otherwise, are referred to the civil authority for investigation and management.

Army Mobile M.M.R. teams

There are two M.M.R. teams in Malaya and one in Hong Kong. The former tour Malaya and Singapore, taking routine M.M.Rs. of Gurkha troops, families and locally employed civilians. The latter does likewise in Hong Kong. Two observers read the miniature radiographs. Large films are taken in doubtful cases.

Unit Tuberculosis Registers

Each Gurkha unit maintains a register in respect of dates of: (a) routine radiography in all cases; (b) follow-up of all B.C.G. vaccination cases; (c) follow-up of all contacts. As regimental medical officers are never very permanent these days, the commanding officer of each Gurkha unit has a responsibility in the keeping up to date and accuracy of this register.

Six-monthly conference

Every six months a conference is held in Malaya to review the progress of
the campaign against tuberculosis and to discuss problems which may have arisen. Those present include all specialists connected with the tuberculosis campaign in Malaya, a representative R.M.O. from the Brigade of Gurkhas, together with the Colonel, the Brigade of Gurkhas, and the Gurkha Liaison Officer (a Lieutenant-Colonel—in command of a Gurkha unit). The medical staff officer of the Federation Army attends as an observer. The presence of combatant officers from the Brigade of Gurkhas shows how much the combatant officers realise their responsibility in the successful prosecution of this campaign against tuberculosis. Their help and co-operation are invaluable.

_Gurkha Sanatorium, B.M.H., Kinrara_

In the last quarter of 1951 the Gurkha Sanatorium came into being when an 18-bedded ward was officially opened. By the second quarter of 1952 this had increased to 90 beds, including accommodation for Gurkha women. In 1953-4, 125 beds in all were occupied at one time. The peak was reached in 1956 when 146 beds were occupied.

The staff consists of a senior medical specialist and medical officers who have either been trained in the modern treatment of tuberculosis at Midhurst or at the Army Chest Centre in the United Kingdom, nursing officers Q.A.R.A.N.C., a British lady welfare officer, British and Malayan nursing orderlies, a Gurkha N.C.O. interpreter, a Gurkha clerk and a senior N.C.O., R.A.E.C. All members of the staff have a positive Heaf test and normal chest radiograph on first appointment. They have a repeat chest radiograph every six months. Some have had B.C.G. vaccination.

The senior N.C.O., R.A.E.C., holds education classes. All Gurkhas are now trained in the "24 Procedures" and for the first aid certificate of the St. John Ambulance Brigade, while selected Gurkhas are trained as laboratory technicians and radiographers.

The Gurkha liaison officer is a frequent visitor to the sanatorium and is readily available at all times should his services be required. The British lady welfare officer devotes her entire energies to the welfare of the Gurkhas, with conspicuous success. Her efforts are well known and include being in charge of their library. Briefly she is their "father and their mother." The patients have excellent facilities for gardening, handicrafts, hobbies of all sorts, including photography, reading, entertainment and sport. The Brigade of Gurkhas' own newspaper, written in Gurkhali, _Parbate_, is very popular and contains information of great interest to the Gurkhas.

As far as possible all patients are accommodated in wards according to their regiment. Outside each ward there is the crest of the regiment. There may be more than one. The regimental and therefore corporate spirit is further fostered by the sanatorium medical officers, who wear the black badges of rank and the Gurkha divisional shoulder flash (crossed _kukris_) worn by officers of the Brigade of Gurkhas. All Gurkha festivals and customs are honoured with due respect. There is a special Gurkha kitchen where all Gurkha food is handled, prepared
and later served by Gurkha cooks from electrically heated trolleys. Meat is "on the hoof" and is duly dispatched in traditional style outside the kitchen.

There is keen friendly rivalry between the wards, who compete eagerly for the gardening cup which is awarded every month and for a shield containing badges of all regiments in the Brigade of Gurkhas which is awarded weekly to the best ward, so judged on the hospital commanding officer's weekly inspection.

The high morale of all patients is to be experienced to be fully appreciated. This is particularly aided by the fact that all families of patients are accommodated as far as possible in the family lines of a neighbouring Gurkha unit. In this way they can visit their menfolk at frequent intervals.

Ambulant non-infectious cases of pulmonary tuberculosis and also cases of pleural effusion are eligible to apply for leave at intervals after at least six months’ chemotherapy, but depending of course on the case. They proceed to a special leave centre where chemotherapy is continued. There are also special occasions which arise when leave may be granted if particularly indicated—for example, Dashera, Delhi Day, Deepvali, birth leave, christening leave.

Thoracic surgery

The officers, warrant officers, N.C.Os. and men are sent to the Army Chest Centre in the United Kingdom. There are facilities for thoracic surgery for women at the Lady Templer Hospital, Kuala Lumpur, where emergency thoracic surgery in either case would be performed.

The first batch of Gurkhas (21) for thoracic surgery in the Army Chest Centre left Kuala Lumpur by air on 19 June 1957. Eight were operated on in July, and were on their return journey to Malaya by sea in October 1957. On arrival in Kinrara they were all in great heart. They had all been to London and said it was "a very nice village" and they had all seen the "Queen's house," too.

Seven of these cases were accepted for further service in the Army. The exception had had a resection of the left upper lobe, including the lingula. To date, 101 Gurkhas have had partial lung resection. Five of them have had the operation performed on both lungs. Three Gurkhas have had thoracoplasty carried out—one of these cases had bilateral thoracoplasty. All operations have been successful, and it is anticipated that all cases of unilateral resection at least are fit for retention in the service. Cases are normally accepted for resection when the site, character and extent of the irreversible disease makes the advantages of resection self-evident (Mackay-Dick, 1958).

To date all cases for resection, with very few exceptions, have had at least twelve months' chemotherapy, and in most cases for considerably longer.

The absence, presence and characteristics of *Mycobacterium tuberculosis* (if any) in the resected specimens should be a pointer as to the value or otherwise of prolonged chemotherapy in sterilising caseous lesions or resulting in non-virulent strains or strains so attenuated that they are incapable of growth on culture or of producing characteristically fatal disease on animal inoculation.
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Resected specimens in all cases are being carefully examined by Dr. Lynno Reid and Dr. R. W. Riddell at the Institute of Diseases of the Chest, London, and by pathologists at the Army Chest Centre. The results of these examinations to date appear to confirm the hopes of long-term chemotherapy in sterilising residual caseous foci (Eade et al., 1959) and confirm the efficacy of one particular régime of chemotherapy used at Kinrara (Mackay-Dick & Slattery, 1958).

Not all apparently solid disease, assessed as such on tomography, is necessarily caseous or fibro-caseous. It is interesting to note how some apparently solid disease shows progressive clearing after twelve months and more of chemotherapy (Eade et al., 1959). That and the effect of the sterilising of caseous lesions with long-term chemotherapy in no way weakens the case for resection in selected service cases, but may lead to further discussion as to the optimum time for resection where facilities for skilled thoracic surgery are available.

Post-operative chemotherapy is continued for twelve months after thoracic surgery has been performed. Many cases therefore have much more than twenty-four months' chemotherapy in all.

The Gurkha's natural dislike of having a planned operation on his chest for reasons other than trauma had to be overcome, particularly when that necessitated removal of part of a lung. He is far from proud of scars on his body which are not the result of battle. That difficulty was surmounted by explaining to him that we were all in the battle against the unseen enemy, the germ of tuberculosis, and that operation scars on the chest were really battle scars, the result of victory in the battle with tuberculosis. That view the Gurkha has accepted and now he wants to know when he is going to have an operation. And if not Why Not?

On first admission to hospital all patients are mentally attuned to the fact that if they do as advised by their medical officers cure will follow. Their faith is touching and rewarding.

It is our intention that every case of tuberculosis, whether or not thoracic surgery is carried out, should receive at least twenty-four months' drug therapy on full pay and allowances. If necessary that period may be increased to thirty months in special cases. On completion of active treatment it is then decided how many Gurkhas will be selected for continued service in the Army.

We define "quiescent disease" as "quietly active disease" necessitating at least twenty-four months' chemotherapy whether or not thoracic surgery is carried out. These twenty-four months of treatment are carried out in at least three of the following locations and in all four when thoracic surgery is carried out: (i) Gurkha Sanatorium, Kinrara; (ii) the Army Chest Centre in the United Kingdom; (iii) the country (convalescent) branch of the Gurkha Sanatorium, B.M.H., Cameron Highlands, situated 5,000 feet above sea level, some 150 miles from Kinrara; and (iv) the Gurkha Rehabilitation Centre at Seremban, some 40 miles from Kinrara.

All cases in Malaya receive a complete review every six weeks by the senior specialist at Kinrara, who also visits B.M.H., Cameron Highlands and Seremban, at intervals.
Sanatorium régime

Every Gurkha on admission to the Gurkha Sanatorium, Kinrara, receives a new copy of the Sanatorium Booklet printed in Gurkhali. It gives much useful information concerning the modern approach to tuberculosis, its cure and prevention. Each Gurkha reads and re-reads it repeatedly. It is given a place of honour in each bedside locker. There is a foreword by the Major-General, the Brigade of Gurkhas.

The Gurkha, fine soldier that he is, does not understand having to be confined to bed when he feels well, so up he gets. As a result, once he becomes bacteriologically negative he is officially allowed up except for the two hours' strict bed rest, compulsory for all patients, every day from 12 noon to 2 p.m. Originally it was the intention to keep patients with cavitiated disease in bed preferably at posture, until cavity closure and resection at the optimum time, but a compromise had to be made.

The following system of coloured cards, originally suggested by Captain D. A. D. Slattery, M.B.E., R.A.M.C., is used. These cards are kept at the head of the bed and are quickly understood by the patients.

RED CARD. On admission the patient is confined to bed except for toilets until he is proved to be bacteriologically negative. Every case is initially assessed clinically, bacteriologically, radiologically and from the relevant laboratory points of view, and thereafter every six weeks. All cases have full plate A.P. tomography on first assessment, while lateral tomography is also carried out in all cases of unilateral disease and in selected cases of bilateral disease where the disease is minimal on one side. In this way the nature, character and radiological extent of the disease is determined as far as possible. Tomography may be repeated in selected cases depending on the case, so that the extent and degree of radiological clearing may be adequately assessed where relevant. Zonal tomography, i.e. coning down only on the areas of disease, is only carried out after full-plate tomography has determined its full radiological extent.

GREEN CARD. Being bacteriologically negative, the patient is on restricted activity in and around the wards, walks in the grounds, light gardening, diversional therapy and education classes in the ward, etc.

YELLOW CARD. The patient is up all day, dressed in hospital clothing, but, like all patients, he has two hours' strict bed rest from 12 noon to 2 p.m. daily. For all up-patients there is a carefully regulated physical rehabilitation scheme to suit each category of up-patient.

Drug Therapy

This consists of streptomycin 1 g. daily together with I.N.A.H. 100 mg. twice daily for 60 to 90 days, depending on the case. Thereafter both drugs, in the doses stated, are given on the same day together every second day to complete twenty-four months. This régime was first choice at Kinrara from 1955 to 1958, and was developed from a similar régime which was first adopted in the
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Army Chest Centre in 1953 (Mackay-Dick & Rothnie, 1954). Its particular value appears to have been confirmed elsewhere (Hutton et al., 1956).

If for any reason these drugs cannot be given together we give P.A.S. 10 g. (2.5 g. \times 4) daily with I.N.A.H. 100 mg. twice daily. In recent months we did not give these drugs continuously but for three monthly periods separated by one drug-free month.

Drug reaction and drug intoxication are watched for carefully. Reactions with streptomycin have been rare and when they do occur it is during the daily administration of the drug. (N.B. Almost without exception our patients are well under forty years of age.) I.N.A.H. has caused no trouble whatsoever. P.A.S. we dislike for its well-known disadvantages. We only use it when forced.

Only six cases are recalled where sputum remained persistently positive for many months before eventually becoming negative. In two of these cases the sputum quickly became negative when the total daily dose of I.N.A.H. (given with streptomycin 1 g.) was stepped up to 450 mg. These cases had fibro-caseous and persistently open cavitated disease normally with cavitory systems. Of the two cases where the total daily dose of I.N.A.H. was stepped up, one had an “emergency” right upper lobectomy at the Lady Templer Hospital. The other had resection of the left upper lobe, including the lingula, at the Army Chest Centre.

In cases of pleural effusion chemotherapy is carried out for a minimum of eighteen months in all cases where a parenchymal lesion is not noted on routine tomography. In the presence of a parenchymal lesion chemotherapy is continued for twenty-four months. Otherwise our treatment is as has already been outlined (Mackay-Dick & Rothnie, 1954).

Diet

All patients have an excellent diet supplemented by the following every day: One bottle (or can) of stout; three compound vitamin tablets; three ferrous sulphate tablets; cod-liver oil and malt.

Expectant mothers

Tuberculosis in expectant mothers is not in itself regarded as an indication for the interruption of pregnancy. Parturition proceeds uneventfully. After the birth of the baby the mother insists on her baby having one feed of her breast milk duly expressed for the purpose. Honour is thereby satisfied. The mother is then happy for her baby to be looked after in a tuberculosis-free environment where B.C.G. vaccination is carried out. In due course the baby is cared for in the Gurkha family lines of a neighbouring Gurkha unit.

Other forms of treatment

We do not use A.P. or P.P. while phrenic crush is never used unless associated with resection.
Follow-up

All patients and families remaining in the service after twenty-four months’ chemotherapy, or longer, with or without thoracic surgery, are followed up. For one year they are employed in a restricted category. We have started giving oral out-patient drug therapy during the period.

It should be mentioned that cases returning to civil life in Nepal do not leave Malaya immediately on completion of twenty-four months’ chemotherapy. It takes time to complete arrangements for passages, while no travel is possible during the monsoon period. Therefore for an additional period of three months or so individuals continue with chemotherapy. Finally when they do leave Malaya we arrange for them to have a three months’ supply of P.A.S. and I.N.A.H. In other words, all our patients really receive a minimum of thirty months’ chemotherapy, while those who remain in the Army complete a minimum of thirty-six months’ chemotherapy.

Nepal is mountainous country and communications are poor. Life is rigorous and the normal expectation of life is not normally considered to be greater than fifty to sixty years. There is said to be one doctor to every 174,000 inhabitants.

Action is taken to follow-up radiologically all tuberculous pensioners. These include pensioners who have not had present-day facilities of the Gurkha Sanatorium in Malaya. Action is being taken to offer treatment to such of these cases who show evidence of recrudescence of activity of tuberculosis. Their dependants are to be included in this scheme.

The future

With the detailed prosecution of the anti-tuberculosis campaign among the Gurkhas, and their families, in the Brigade of Gurkhas, FARELF, particularly those cases who have had resection, it is anticipated that the incidence of relapse cases will have been reduced to a bare minimum.

It is understood that successful B.C.G. vaccination in Heaf test-negative reactors will reduce the incidence of tuberculosis in such individuals by some 80 per cent. That being so, as a preliminary, a W.H.O. tuberculin skin test survey of Nepal with successful B.C.G. vaccination of all negative reactors, together with chemotherapy for all Heaf test-positive infants and children of three years and under (in the absence of other evidence of tuberculosis), would be a great first step in the conquest of the disease in Nepal.

Yesterday and today

A few years ago the acquisition of tuberculosis meant to the Gurkha soldier the end of his chosen career and, indeed, the premature end of the road. It was a case of *Lochaber No More* for these Gurkha clansmen who march proudly to the skirl of the pipes and who wear, in many cases, in their headdress-flashes the tartans of Scotland. Today when the Gurkha soldier stands in the shadow of tuberculosis he knows that we shall go forward together to final victory over
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that once dreaded disease; so that he may return to his regiment and “soldier on” or return to a healthy vigorous life in his small holding in Nepal.

I am grateful to Lieutenant-General Sir Alexander Drummond, who first envisaged this entire scheme when he was A.D.M.S., H.Q., Malaya Command, and who has pursued it with inspiring determination to the present day; to Lady Templer, whose productive interest in the welfare, health and happiness of the Gurkhas has been a source of great encouragement; to Sir Geoffrey Todd, honorary consultant physician in pulmonary tuberculosis to the Army, who has trained our specialists in this field; to the Major-General, the Brigade of Gurkhas, and his regimental officers, who recognised and pursued the invaluable part to be played by them in this anti-tuberculosis campaign; and to Mr. G. Kent Harrison, thoracic surgeon at the Army Chest Centre. I must also pay tribute to the tireless devotion of all medical, nursing and welfare officers and all the British and Malayan nursing orderlies, and instructors in the R.A.E.C., for their part in the increasing success of this great work.

REFERENCES


THE WILL TO LIVE*

BY

Lieut.-Colonel E. M. TURNER, M.B.E., R.R.C.

Queen Alexandra's Royal Army Nursing Corps

Probably most of us, at some time during our life, find ourselves up against circumstances when we need all our will-power to help us survive.

The will to live! How deeply rooted is this basic urge? How does it manifest itself, and when, if ever, are we conscious of it? That it is there is indisputable. It is at the core of existence. Because of it nations survive, through travail and tribulation, and the individual no less than the nation. Indeed, in times of acute stress it is, and has always been, the most prominent quality of the social order, the driving force of human achievement. Is this will to survive linked with a faith, or belief? I feel sure that it is.

When I left a blazing Singapore Harbour on Friday, 13 February 1942, for "an unknown destination"—probably Java—it never entered my head that I would not eventually get there. I think I embarked quite cheerfully, though

* A talk given at the Director-General's Exercise, October 1959.
Tuberculosis Among the Gurkhas and their Dependants: Serving with the United Kingdom Forces in the Far East

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*J R Army Med Corps* 1960 106: 28-36
doi: 10.1136/jramc-106-01-05

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