Case holding in patients with tuberculosis in Botswana

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Abstract

***Objective*—To evaluate the effectiveness of daily supervised short course chemotherapy in a national tuberculosis programme.**

***Design*—Observation of programme during 1984-90. In October 1986 short course chemotherapy was introduced with patients receiving treatment daily from staff in their nearest health facility.**

***Setting*—Botswana national tuberculosis programme.**

***Subjects*—All patients with tuberculosis.**

***Main outcome measures*—Proportions of patients complying with and defaulting from treatment (missing ≥43 days' treatment).**

***Results*—2938 cases of tuberculosis were recorded in 1990, 1528 of which were of sputum positive pulmonary disease. 2711 (92·3%) patients complied with treatment and 227 (7·7%) defaulted. Before introduction of short course chemotherapy compliance was about 60% compared with over 90% in 1987-90.**

***Conclusions*—A programme using daily supervised short course chemotherapy integrated into the primary health care system is an effective method of treating tuberculosis. The costs of the programme need to be evaluated.**

Introduction

The Botswana national tuberculosis programme is unique in both its approach and its implementation. Short course chemotherapy is given to all patients who have tuberculosis diagnosed and treatment is supervised daily for the entire six months. This approach has achieved high compliance rates. The successes can be attributed to intensive repeated health education, commitment of health workers, well developed health infrastructure, and integration of the programme into the primary health care structure.

Developing countries often have difficulty implementing the tuberculosis case finding and case holding components of their programmes.[1-3] This paper illustrates the success of daily supervised treatment of all patients with tuberculosis in Botswana with short course chemotherapy.

Methods

The Botswana national tuberculosis programme was established in 1975 with the aim of reducing the number of tuberculosis cases in the country to as low a level as possible in as short a time as possible, bearing in mind the financial constraints pertaining to the health services in the country.[4] The four major components of the programme are BCG vaccination, case finding, case holding and treatment, health education and staff training.

At the programme's inception the official regimen of treatment was long course chemotherapy for one and a half to two years and follow up of up to two years thereafter. After a pilot study in two of the 19 districts in the country, streptomycin, short course chemotherapy was introduced in October 1986. Treatment consisted of a short course regimen (two months' treatment with isoniazid, rifampicin, and pyrazinamide and four months' treatment with isoniazid and rifampicin) for all forms of the disease—that is, irrespective of whether patients had sputum positive pulmonary tuberculosis, sputum negative pulmonary tuberculosis, or extrapulmonary tuberculosis. Treatment was ambulatory in most cases, and fully supervised daily by health workers at the nearest health facility throughout the whole six month course.

The programme has been integrated into the primary health care system to ensure effective implementation. Nationally it is headed by an epidemiologist, who is assisted by two tuberculosis coordinators. At the district level it is headed by district medical officers, assisted by district tuberculosis coordinators. Other important health workers are nurses and family welfare educators, who are the first contact between the community and the health care system at the peripheral health facilities.

Once patients with tuberculosis are ambulatory they are discharged to the nearest health facilities to their homes. Patients obtain daily treatment from health workers in that facility, who record attendance daily on treatment cards. Those who fail to attend are followed up and traced by health workers the day after default, usually by family welfare educators during home visits in their catchment population. Any patient who at any point has missed 43 days of treatment or more is regarded as a defaulter and would be restarted on treatment after return. Those who have missed more than 22 days but less than 43 days of treatment by six months are regarded as irregular attenders and given an additional six weeks' treatment when traced. Patients who have missed 21 days of treatment or less at six months are regarded as having completed treatment.

District tuberculosis coordinators check treatment cards for all patients in their districts monthly, compile the statistics, and calculate compliance of patients. Reports are received at the national centre from all districts every quarter. Data are analysed by the quarterly cohort analysis system and compliance calculated as the total number of days attended for all patients receiving treatment divided by the total number of days expected for treatment during that quarter. Although the exact number of irregular attenders is not recorded, reports from district tuberculosis coordinators indicate that this proportion of patients is small and that most patients attend health facilities regularly or are followed up by family welfare educators immediately on default.

Results

In 1990 2938 cases of tuberculosis were recorded, giving an incidence of 223 per 100 000 population. Of these patients 1528 (52%) had sputum positive pulmonary tuberculosis, giving a sputum positivity rate of 115 per 100 000 population. The compliance of all patients was 92·3% (2711) and the defaulter rate was 7·7% (227). During 1984-90 pulmonary cases represented around 71% of all new cases and sputum positive cases accounted for about 70% of pulmonary cases—that is, 50% of the total case load. The table shows that compliance increased considerably after the short course regimen was introduced, from 60%

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Numbers (percentages) of patients complying with and defaulting from treatment for tuberculosis in Botswana, 1984-90

Year	No (%) complying	No (%) defulting
1984	1876 (60·5)	1225 (39·5)
1985	1821 (67·3)	381 (14·1)
1986	2049 (78·0)	360 (13·7)
1987	3011 (94·9)	162 (5·1)
1988	2570 (93·8)	170 (6·2)
1989	2410 (95·2)	122 (4·8)
1990	2711 (92·3)	227 (7·7)

in 1984 to above 90% in 1987-90. Defaulter rates decreased from 40% in 1984 to less than 10% in 1987-90.

The programme did not insist on the sputum status of patients being reported at the end of chemotherapy as it was difficult to obtain sputum from many of the patients who completed the treatment course. Hence meaningful cure rates could not be obtained. This is one aspect in which the programme could be strengthened. Of the sputum positive cases notified in 1987-9, sputum results were available in 788 (44%), 664 (41%), and 546 (35%) of the cases; the cure rates for these years were 772 (98%), 644 (97%), and 546 (98%) respectively.

Discussion

Short course chemotherapy has been shown to be more cost effective than standard 12 month regimens,[5,6] but compliance of patients is essential.[7,8] One of the controversies in the management of patients with tuberculosis has been supervision of treatment.[9] In Botswana we have shown that daily supervised treatment of all patients with tuberculosis improved compliance. High compliance has been achieved by intensive repeated health education to patients and their relatives and constant supervision and follow up of health workers at all levels of the health care system. Health education has been integrated into primary health care activities at district and peripheral levels. Education of health workers and the community on tuberculosis has been incorporated into in service training programmes, which occur at least two to three times a year in each district. At the national level seminars and workshops are held every six months to update district tuberculosis coordinators on the latest advances and methods of preventing and controlling tuberculosis.

Case holding has been one of the main successes of the Botswana tuberculosis programme. This can be attributed to introduction of short course chemotherapy, good health infrastructure, integration of the programme into primary health care system, and vigorous health education. The costs of providing short course chemotherapy and daily supervised treatment to all patients needs to be evaluated. Further study of the epidemiology of tuberculosis is also needed in view of the well established interaction between tuberculosis and HIV worldwide.

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Childhood cancer, intramuscular vitamin K, and pethidine given during labour

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Abstract

***Objective*—To assess unexpected associations between childhood cancer and pethidine given in labour and the neonatal administration of vitamin K that had emerged in a study performed in the 1970 national birth cohort.**

***Design and setting*—195 children with cancer diagnosed in 1971-March 1991 and born in the two major Bristol maternity hospitals in 1965-87 were compared with 558 controls identified from the delivery books for the use of pethidine during labour and administration of vitamin K.**

***Main outcome measures*—Odds ratios for cancer in the presence of administration of pethidine or of intramuscular vitamin K. Both logistic regression and Mantel-Haenszel techniques were used for statistical analyses.**

***Results*—Children of mothers given pethidine in labour were not at increased risk of cancer (odds ratio 1·05, 95% confidence interval 0·7 to 1·5) after allowing for year and hospital of delivery, but there was a significant association (p=0·002) with intramuscular vitamin K (odds ratio 1·97, 95% confidence interval 1·3 to 3·0) when compared with oral vitamin K or no vitamin K. There was no significantly increased risk for children who had been given oral vitamin K when compared with no vitamin K (odds ratio 1·15, 95% confidence interval 0·5 to 2·7). These results could not be accounted for by other factors associated with administration of intramuscular vitamin K, such as type of delivery or admission to a special care baby unit.**

***Conclusions*—The only two studies so far to have examined the relation between childhood cancer and intramuscular vitamin K have shown similar results, and the relation is biologically plausible. The prophylactic benefits against haemorrhagic disease are unlikely to exceed the potential adverse effects from intramuscular vitamin K. Since oral vitamin K has major benefits but no obvious adverse effects this could be the prophylaxis of choice.**

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Introduction

Most studies of the factors acting in fetal or early life that are relevant to childhood cancer have been, for obvious reasons, case-control and retrospective in design.[1-4] Retrospective studies have the advantage that large numbers of affected subjects may be covered, but they can also be subject to biases such as differential recall between cases and controls of events often long since past. It is therefore important to test the findings wherever possible by prospective studies.

Information collected prospectively on a nationally representative sample of pregnancies delivered in 1970 was examined to assess potential factors associated with subsequent cancer in childhood.[5] Information on 16 193 infants delivered in Great Britain in one week of