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Bacteriological survey of tuberculous lymphadenitis in southeast England, 1981–1989

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Abstract

***Study objective*—The aim was to detect any changing trends in the nature and incidence of tuberculous lymphadenitis in southeast England and to determine whether there is any evidence for an increase in this disease that could be related to HIV infection.**

***Design*—Mycobacteria isolated from patients with lymphadenitis in the years 1981 to 1989 were identified. Information was available on the age, sex, and ethnic origin of the patients and the anatomical site from which the mycobacterium was isolated.**

***Setting*—The Public Health Laboratory Service Regional Tuberculosis Centre at Dulwich, which receives over 95% of mycobacteria isolated in southeast England.**

***Main results*—From 1980 to 1989, cultures were received from 1817 patients with mycobacterial lymphadenitis: 1677 were *M tuberculosis*, 25 *M bovis*, 21 *M africanum*, and 94 were other (environmental) species. In comparison with a survey conducted in the same region in 1973–80, the number of ethnic Indian subcontinent patients with lymphadenitis due to *M tuberculosis* had dropped by 30% and the number of European patients had dropped by 43% and showed a continuing decline and a shift towards an older age group. By contrast, there was a 20% increase in the number of cases due to environmental mycobacteria. The number of species causing such infections had increased and a greater proportion of patients were adults. Three patients infected by environmental mycobacteria were known to be HIV positive.**

***Conclusions*—The incidence of lymphadentis due to *M tuberculosis* is declining but cases due to environmental mycobacteria are increasing, with a greater diversity of species and more adult patients. There is no conclusive evidence for an impact of HIV infection on the incidence and nature of mycobacterial lymphadenopathy in southeast England, but this cannot be ruled out.**

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Tuberculous lymphadenitis, or scrofula, is a disease of great antiquity yet it is still encountered in Great Britain and other developed nations. In such countries, tuberculosis has, for many years, been in decline but the appearance of the human immune deficiency virus (HIV) threatens to alter this. Indeed, the association of this virus and tuberculosis has led to an increase in the incidence of the latter in the USA. Thus a continued surveillance of all forms of tuberculosis is required. In addition, various species of mycobacteria that normally exist as environmental saprophytes occasionally cause opportunist disease, including lymphadenopathy, in man and the incidence of such disease is unaffected by tuberculosis control measures. Futhermore, immunosuppressed persons, including those infected with HIV, are particularly prone to such opportunist mycobacterial infection which often manifests as non-pulmonary disease, including lymphadenitis. Indeed, such disease is one of the criteria for the definition of AIDS.[1]

A bacteriological survey of tuberculous lymphadenitis was carried out in southeast England during the period 1973 to 1980.[2] As a further nine full years have passed, we have conducted a further survey in order to see whether there are any changing trends in the epidemiology of this form of tuberculosis and, in particular, to determine whether there is any evidence for an increase in the disease that could be related to HIV infection.

Methods

About 95% of all mycobacteria isolated in southeast England are referred for identification and drug sensitivity testing to the Public Health Laboratory Service Regional Tuberculosis Centre at Dulwich. Information is usually supplied on the age and sex of the patient and the anatomical site from which the mycobacterium was isolated. Patients are divided into those of apparent European, Indian subcontinent, African, and Far East ethnic groups on the basis of their names.

Tubercle bacilli were divided into the classical and Asian types of *M tuberculosis*, *M bovis*, and *M africanum* types I and II according to their oxygen preference (aerobic or microaerophilic), nitratase activity, and susceptibility to pyrazinamide and thiophen–2–carboxylic acid hydrazide (TCH)[3 4].

Other mycobacterial species (environmental, opportunist, or "atypical") were identified according to cultural and biochemical tests[4 5] supplemented, when necessary, by lipid chromatography.[5]

Results

During the nine year period, a total of 1817 patients with mycobacteria isolated from lymph nodes were registered at the Public Health Laboratory Service Regional Tuberculosis Centre, Dul-

wich; 1677 cultures were identified as *M tuberculosis*, 25 as *M bovis*, 21 as *M africanum* (16 type I and five type II), and 94 as environmental species

Table I shows the annual numbers of isolates of *M tuberculosis* from Indian subcontinent, European, and other ethnic groups. Most isolates (69·9%) were from Indian subcontinent patients. The disease was more frequent in females than males—2·12:1 in the Indian subcontinent group and 1·12:1 in the European group.

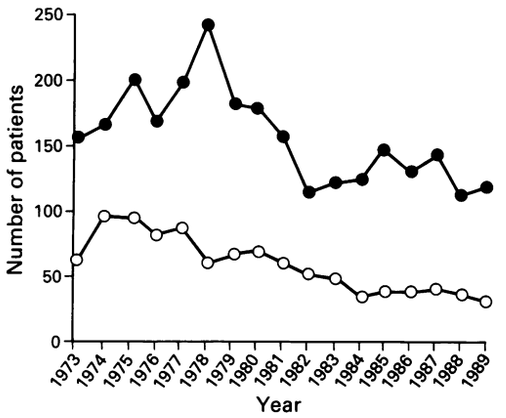

Figure 1 Annual number of patients with lymphadenitis due to mycobacterium tuberculosis, *1973–1989.* ●——● *Patients of Indian subcontinent ethnic origin;* ○——○ *Patients of European ethnic origin.*

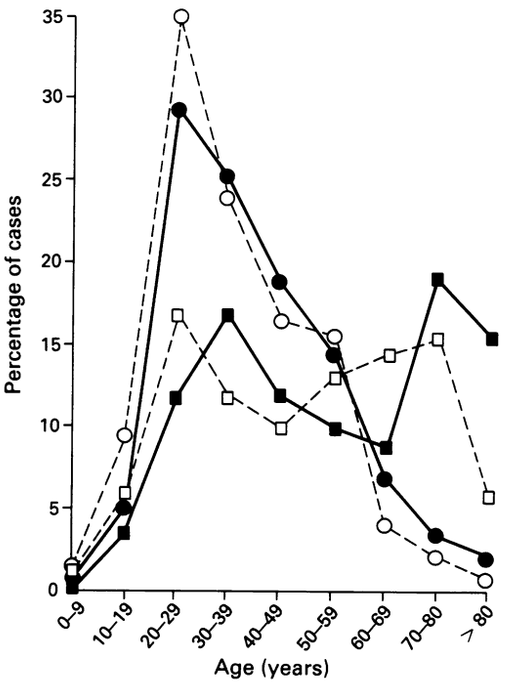

Figure 2 Age distribution of patients with lymphadenitis due to Mycobacterium tuberculosis. ●——● *Patients of Indian subcontinent ethnic origin, 1981–1989;* ○– –○ *Patients of Indian subcontinent ethnic origin, 1973–1980;* ■——■ *Patients of European ethnic origin, 1981–1989;* □– –□ *Patients of European ethnic origin, 1973–1980.*

Figure 1 shows the annual number of cases in the Indian subcontinent and European groups for the two study periods 1973–80 and 1981–89. The annual number of European patients has declined since 1973 while the number of Indian subcontinent patients has been more erratic, with a steep decline from a peak in 1977 until 1981 but with no significant decline since that year.

Figure 2 shows the age distribution of patients in the Indian subcontinent and European groups and, for comparison, the age distribution during 1973–1980.

Table II shows the distribution of disease according to the anatomical site of the affected lymph nodes. The Asian type of *M tuberculosis* (sensitive to TCH) was isolated from 47 European patients (12%) and 241 Indian subcontinent patients (21%).

Table III shows the ethnic origin of the patients infected with *M bovis* or *M africanum*. With the exception of a 23 year old patient with a French name, none of the European patients were infected with *M africanum*. Thirty seven of the 46 isolates were from cervical nodes, five from the axilla, one each from the mediastinum and abdomen, and two from unspecified sites. The European patients were, with the exception of the patient infected with *M africanum*, aged 48–85 (mean 72) years. The Indian subcontinent patients were aged 24–78 (mean 37) years and the Africans 23–45 (mean 31) years. The European patients were significantly older than both Indian subcontinent and African patients ($p < 0{\cdot}001$).

Table IV shows the annual numbers of isolates of environmental mycobacteria according to species. The site of the affected lymph node was known in 82 of the 94 cases: 63 of these were from the cervical region, three each from the axilla and mediastinum, two from the inguinal region, and one from an abdominal node. Most isolates were from patients of European ethnic origin: 31 from children under 5 years, 11 from children aged 5–9, six from children aged 10 to 16, 18 from adults and six from patients of unknown age. Eighteen isolates were from Indian subcontinent patients; eight from children under 5 years, two from children aged 5–9, five from adults, and three from patients of unknown age. Two isolates were from patients with African names (aged 3 and 83) and two were from patients with Chinese names (aged 1 and 5). Table V summarises the details of the adult patients. Three of the patients, including one haemophiliac, were known to be HIV positive.

Table I Annual number of isolations of M tuberculosis *according to ethnic origins of the patients*

Ethnic Origin	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*Total*	*%*
ISC	158	114	123	126	147	131	142	113	118	1172	69·9
European	61	53	50	35	40	40	42	38	33	392	23·4
Other	13	9	8	10	9	12	18	12	22	113	6·7
Total	232	176	181	171	196	183	202	163	173	1677	

ISC = Indian subcontinent

Table II Site of origin of strains of M tuberculosis

Site of disease	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*	*Total*	*%*
Neck	183	146	136	127	164	137	153	111	116	1273	75·9
Axilla	19	11	17	16	9	13	12	10	11	118	7·0
Inguinal	3	1	2	5	2	1	1	2	0	17	1·0
Abdomen	5	1	2	2	2	3	4	6	0	25	1·5
Mediastinum	3	4	5	6	4	9	4	5	5	45	2·7
Unspecified	19	13	19	15	15	20	28	29	41	199	11·9
Total	232	176	181	171	196	183	202	163	173	1677	

Discussion

The number of patients with bacteriologically confirmed lymphadenitis in southeast England due to *M tuberculosis* (1677 cases) was less than in the period 1973 to 1980 (2207 cases), even though the former period only covered eight years. The number of cases in the Indian subcontinent group dropped from an expected 1676 to 1172, a 30% decrease, while in the European group the decrease was from an expected 686 to 392, a 43% decrease. Furthermore, the decline in the annual incidence in the European group between 1981 and 1989 was significant and there was a shift in the age range towards an older age. Tuberculous lymphadenopathy has been reported in HIV positive individuals but we found no evidence for an increase in the incidence of this infection in young adults. However, HIV related tuberculosis is still uncommon in southeast England.[6]

Before 1978, isolates of *M africanum* would have been identified as "bovine" strains; thus a direct comparison of the data for 1973–80 and the figures from this study is not possible. The total number of isolates of both species, however, dropped from 65 to 46. The age distribution of the European patients with lymphadenopathy due to *M bovis* suggests that these cases represent reactivation of old infection. In a survey of all forms of tuberculosis due to *M bovis* in southeast England between 1977 and 1987, this species was responsible for 201 cases (1·2%) of bacteriologically confirmed tuberculosis but only two of 167 European patients were born after 1960, the year when the bovine tuberculosis eradication programme was completed.[7] Thus we conclude that human tuberculosis due to *M bovis* among the indigenous British population is a residue from the days when milk borne infection was common and therefore this type of tuberculosis is likely to decline in this population. *M africanum* was responsible for 209 cases of tuberculosis (1·25%) in the same region and over the same period of time.[8] Disease due to this species occurred in 47 patients with European names but lymphadenitis was rare, accounting for only two cases, one of which occurred in the period covered by this study.

The incidence and nature of lymphadenitis due to, or associated with, environmental mycobacteria in the period 1981–89 showed several differences from the period 1973–80. The incidence increased from 67 to 94 which, allowing for the extra year in the latter period, is a 20% increase. In the period 1973–80, cases of lymphadenitis were due to five species: *M avium-intracellulare*, *M scrofulaceum*, *M chelonae*, *M kansasii*, and *M xenopi*. The number of isolations of these species in the period 1981–89 was very similar—the increase in the number of cases of lymphadenitis was due to species not encountered in the previous study, namely *M malmoense*, *M fortuitum*, *M flavescens*, and unidentified scotochromogens. The reason for the increased diversity of species is unknown but it is of note that there has been a general increase in the isolation rate of *M malmoense*, mostly from sputum, since the early 1980s.[9]

Two other noteworthy changes were seen in the epidemiology of lymphadenitis associated with environmental mycobacteria. First, with one exception, all isolations in the 1973–80 study were from cervical nodes, whereas in this study nine isolations were from other sites. Secondly, in the earlier study, only three of 59 patients (5·1%) of known age were adults (aged > 16), whereas in this study 24 of 83 patients (29%) were adults. It is usually stated that lymphadenopathy due to environmental mycobacteria is predominantly an infection of children aged less than five years[10] but this statement now clearly needs to be modified. Indeed, just under half (41 of 83) of the patients of known age in this study were aged less than five years. The reason for the change in age distribution is unknown. One possibility is the increasing prevalence of HIV infection. Three of our adult patients were known to be HIV positive and all were infected with *M avium-intracellulare* which, apart from *M tuberculosis*, is the most frequently encountered HIV related mycobacterial pathogen.[11] The possibility that some of the other adult patients infected with this or other species were also infected with HIV cannot be excluded. Helbert *et al*[12] described 15 HIV positive patients infected with *M avium-intracellulare* and in four cases cultures were obtained from lymph nodes. An additional patient was infected by *M kansasii* which was isolated from retroperitoneal lymph

Table III Ethnic origin of patients infected with M bovis *or* M africanum *types I and II*

Ethnic origin	*Type of bacterium*			
	Bovine	*African I*	*African II*	*Total*
Asian	6	11	2	19
African	3	4	3	10
European	16	1[a]	0	17
Total	25	16	5	46

[a]French name

Table IV Annual numbers of isolations of environmental mycobacteria

Species	*1981*	*1982*	*1983*	*1984*	*1985*	*1986*	*1987*	*1988*	*1989*
M avium-intracellulare	2	6	11	3	8	10	9	6	3
M scrofulaceum	0	1	2	0	0	1	0	1	1
M kansasii	1	1	0	0	0	0	0	2	0
M chelonae	0	1	0	1	0	0	0	0	1
M xenopi	0	1	0	0	0	0	1	0	0
M malmoense	0	0	1	0	1	3	1	2	0
M fortuitum	0	0	1	0	0	1	1	2	0
M flavescens	0	1	0	0	1	0	0	0	0
Others[a]	1	0	0	1	2	0	0	1	1
Total	4	11	15	5	12	15	12	14	6

[a]Unidentified scotochromogens

Table V Adults from whom environmental mycobacteria were isolated

Year	*Age*	*Ethnic group*	*Sex*	*Site of infection*	*Mycobacterial species*	*HIV status*
1981	29	European	M	Cervical	Scotochromogen	
1982	44	European	F	Axilla	*M flavenscens*	
1982	53	ISC	F	Cervical	*M xenopi*	
1982	59	European	F	Unknown	*M avium-intracellulare*	
1984	57	European	F	Cervical	*M cholonae*	
1984	31	ISC	M	Mediastinum	Scotochromogen	
1985	55	ISC	F	Cervical	*M avium-intracellulare*	
1985	48	European	M	Cervical	Scotochromogen	
1985	88	European	F	Cervical	*M arvium-intracellulare*	
1986	83	African	M	Cervical	*M fortuitum*	
1986	33	European	F	Cervical	*M malmoense*	
1986	31	European	M	Mediastinum	*M avium-intracellulare*	
1987	43	European	M	Cervical	*M avium-intracellulare*	
1987	32	European	M	Unknown	*M avium-intracellulare*	+ve
1987	49	European	M	Unknown	*M avium-intracellulare*	
1987	34	ISC	M	Abdominal	*M avium-intracellulare*	+ve
1987	54	European	F	Unknown	*M xenopi*	
1988	33	ISC	M	Cervical	*M avium-intracellulare*	
1988	29	European	M	Unknown	*M avium-intracellulare*	+ve
1988	38	European	M	Axilla	*M malmoense*	
1988	20	European	F	Cervical	*M avium-intracellulare*	
1988	46	European	F	Cervical	*M kansasii*	
1988	33	European	M	Mediastinum	Scotochromogen	
1989	19	European	F	Cervical	*M chelonae*	

ISC = Indian subcontinent

nodes and pleural fluid. Thus we recommend that, whenever possible, adult patients with lymphadenitis due to environmental mycobacteria should be tested for antibody to HIV and that the epidemiology of such infection in the community should be closely monitored by bacteriological surveillance.

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William Augustus Guy, MD, Examined

Epidemiology of Tuberculosis in the 19th century

There is an opinion abroad that consumption is a national disease; that it is more prevalent in England than in other countries—does this opinion seem to you to be well founded?——No; I believe it to be a vulgar prejudice; it is altogether unsupported by facts: but, as we have at present no means of comparing one country with another in this respect, it is not possible to prove its fallacy. The opinion, whether true or false, has exercised a very injurious influence upon the public health—it has turned men aside from an inquiry into the removable causes of consumption and led them to regard the disease as a sad necessity beyond the reach of prevention. Englishmen, generally, seem to take a sort of pride in making themselves out worse than they are. Not long since we believed ourselves to be the most suicidal nation in the world, and we were not easily convinced to the contrary. We are always croaking about something or other, and our extraordinary liability to consumption is a favourite topic with us. If we are more liable to it than other nations, I am convinced that it is because we have a larger proportion of our population engaged in manufactures, of whom a considerable number lead sedentary lives, and suffer from overcrowding and overwork, joined, in many cases, to habits of intemperance unknown abroad.

You are, then, of opinion, that there is nothing in the climate of England, or in the constitutions of Englishmen, which predisposes them to consumption in a greater degree than the natives of other countries?——I am; but I speak of the European nations only.

You say that you have generally found employers willing to do anything which does not entail great expense, is this very generally the case?——Very generally; but I ought to add that when the greatest willingness has been shown, very slight obstacles have sufficed to prevent these good intentions from being carried into effect. This happened in the case of a poor water-gilder, suffering from trembling palsy, caused by frequent exposure to the fumes of mercury. I suggested to his employer a very simple plan of getting rid of these poisonous fumes, and he promised willingly and gratefully to adopt it. I called after a few days, and found that he contemplated some alteration in his premises in two or three months' time, that he had thought of a plan that seemed to him preferable, and would then adopt it. Though evidently a humane and intelligent man, he seemed to think as little of this delay as if the health and life of a fellow-creature were not in question. Thus it is with all classes. They form a low estimate of the value of life and health. A man dies, and another replaces him without cost to his employer; but if it were a horse or a dog, the owner would have to pay for a new one. This makes all the difference. A man falls sick, and he, and not his employers, has to pay for his illness. A horse or a dog would have cost something. And yet these persons, who would be more anxious about a horse or a dog than about a man, are not necessarily hard-hearted. They have never been roused to a sense of the surpassing value of health and life. Even the educated classes are rendered in some degree indifferent to human life by a false theory, which, I believe, originated with a religious and humane man, or if not, is certainly entertained by many such men, namely, that plagues and consumptions were intended by Providence to keep down a redundant population. We now know better; and it may be hoped that better feelings will spring up with sounder information. There is much ignorance to be removed, and much prejudice to be overthrown before the rich will do justice to the poor, and the employer to the workman. Those who use glazed cards, for instance, little think how many palsied hands are due to the glaze which the manufacturers use. As little effort is made to substitute some wholesome material for common paint as if there were no such thing as painters' colic or the dropped hand. So also men are constantly breathing irritating fumes, and metallic particles, and poisonous air, with scarcely an attempt to get rid of them by ventilation or other efficient means. There is a general indifference on the part of the rich, and a corresponding recklessness on the part of the poor. A long time must elaspe before either party will learn the true economy of health, and become duly impressed with the duty and gain of preserving it.

First Report of the Commissioners
for inquiring into the state of large towns
and populous districts, 1844