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TUBERCULOSIS IN SOHO

BY

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Of the 3,105 catering establishments in the City of Westminster over 400 are concentrated in Soho. Tinker (1959) suggested that workers in the catering trade in this area have a particularly high incidence of pulmonary tuberculosis. The present survey was made to try to find out the true position and to answer certain questions. For instance, is tuberculosis usually contracted before or after joining the trade? If before, is it because catering attracts workers whom tuberculosis has incapacitated for other types of work, or is it, in the case of workers from abroad, because they already have the disease when they arrive in Britain? If after, is it because previously uninfected workers get their primary infection after entering the crowded working conditions of the trade, or is it simply that those who have already had their primary infection break down as a result of adverse working or living conditions?

Method

The area chosen for the inquiry was the electoral ward of Soho, which covers about 1/7 square mile (0.37 sq. km.) in the City of Westminster. The names of some 400 catering establishments were provided by the Public Health Department and 240 were included in the survey. There were 47 public-houses and 193 restaurants, cafés, and coffee-bars. It was not administratively possible to include the clubs, staff canteens, and theatre bars which made up the total figure.

A personal letter was written to each proprietor, manager, or licensee, explaining the purpose of the survey and asking him to supply the names of his staff so that each individual could be sent an explanatory letter and an appointment for an x-ray examination. Replies to these letters were received from 105 establishments; 96 gave the names of their staff and 9 gave numbers only. One of us (G. B.) visited the 135 employers (56%) who did not reply, and on this approach a further 99 gave the names of their staff and

34 gave numbers, thus leaving only two establishments from which no information could be obtained. In this way the total sample was estimated to be 4,733 workers.

Arrangements were made with the South-West London Mass X-ray Service for one of their mobile units to make 12 visits to various sites in Soho between January and June, 1960, and for their static unit to make a four-day visit to one large establishment which employed approximately 1,800 people. It was not possible to send each of these 1,800 workers an individual letter, but the management publicized the visit and encouraged their employees to attend during working hours; 930 (52%) of the 1,800 were interviewed and x-rayed.

Each of the sites chosen for the mobile unit was as near to as many restaurants as possible. About four days before each visit of the unit an explanatory letter was sent to each person in the appropriate restaurants telling them the time and place for their x-ray examination. In this way personal letters were sent to 2,933 workers and 1,319 (45%) kept the appointment to be interviewed and x-rayed. Those who failed to attend were sent another appointment and asked to state whether they were already attending a chest clinic or hospital. Information and x-ray films were obtained for a further 362 (12%).

Thus, of the 4,733 workers approached in various ways, 2,611 (55%) responded. Before being x-rayed each person was interviewed and helped to complete a questionnaire answering the following questions: Age? Sex? Address? Occupation? Place of work? In which country did you spend your childhood? How many years have you spent in the catering trade? How long have you been at this café/restaurant/public-house? How long have you been in Great Britain?

Those workers whose miniature chest radiographs were normal were so informed and those with abnormal films were recalled for further radiological and clinical assessment at Westminster Hospital Chest Clinic. After any necessary investigations the workers with radiographic evidence of pulmonary tuberculosis were classified as follows:

1. Active pulmonary tuberculosis requiring treatment with antituberculous drugs: (a) sputum negative for tubercle bacilli, (b) sputum positive for tubercle bacilli.
2. Pulmonary tuberculosis not requiring active treatment but requiring observation at clinic.
3. Healed pulmonary tuberculosis not requiring observation and therefore discharged from further attendance.

In the patients who showed evidence of pulmonary tuberculosis an assessment was also made of the duration of the disease, with particular reference to the time of joining the catering trade and, in the case of immigrants, the time of arrival in Great Britain. This assessment was made on the clinical history, the radiographic appearances, and the history of previous radiographic examinations.

Results

Of the 2,611 workers examined, 86 showed radiological evidence of past or present tuberculosis. The 86 cases were divided into three groups. In the first or "active" group there were 21 patients suffering from active tuberculosis requiring treatment with antituberculous drugs: sputum examinations for tubercle bacilli were positive in 6 and negative in 15. In the second or "observed" group there were 32 patients with tuberculosis requiring clinic observation only; two of these patients were already attending a chest clinic elsewhere.

Tuberculosis appeared more often before than after joining the trade in those from China and Hong Kong (11:8), in those from Italy (6:2), in those from Ireland (2:1), and in those from the West Indies (1:0). The disease appeared just as often before as after joining the trade in those from India and Pakistan (2:2).

The numbers in Table IV refer to the time of joining the catering trade, whether in this country or abroad, but, although some of the workers from abroad were in the catering trade before coming to the United Kingdom, none developed tuberculosis in the catering trade abroad. Exactly the same numbers are therefore obtained whether the information is considered with reference to either joining the catering trade in the United Kingdom or simply coming to the United Kingdom.

Table IV is based on all the cases of tuberculosis whether active, observed, or inactive. To try to find out when and why tuberculosis occurred in those workers

TABLE V.—Incidence of Active Pulmonary Tuberculosis per 1,000 Persons According to Length of Time in Catering Trade for Chinese and All Other Nationals

Years in Catering Trade	Chinese		Other Nationals	
	No. X-rayed	Incidence of Active P.T.B. per 1,000	Incidence of Active P.T.B. per 1,000	No. X-rayed
0 up to 2 ..	66	45	0	510
2 .. 3 ..	25	80	22	183
3 .. 5 ..	28	107	15	261
5 .. 7 ..	23	87	0	210
7 or more ..	37	0	3	1,183
No reply ..	7	0	0	78
Totals ..	186	53.8 (10 cases)	4.5 (11 cases)	2,425

who developed the disease after joining the trade the time intervals at which the active cases were discovered after joining the trade were studied. Table V shows this as the incidence of active tuberculosis per 1,000 workers according to the number of years in the catering trade. Because the Chinese form such a high proportion of the active as well as the inactive cases they are considered separately from the rest of the workers, the other nationals.

Only 4 of the 21 patients with active disease had been born in Britain; they had been in the catering trade for 2, 3, 34, and 35 years respectively. Their evenness of distribution in Table V means that the findings mainly reflect the incidence of active disease in the immigrants.

For those Chinese who had been in the catering trade for less than two years the incidence of active tuberculosis was 45 per 1,000 persons, whereas the incidence in the same period among the other nationals was nil.

In the subsequent years the Chinese still showed a high incidence until the beginning of the seventh year, after which there were no active cases among the few who had been in the catering trade so long. The other nationals showed an incidence of 22 and 15 active cases per 1,000 among those who had been in the catering trade between two and less than three years and between three and less than five years respectively. The incidence was only 3 per 1,000 among those who had been in the catering trade more than seven years.

Discussion

We realize that the results of this survey are based on a 55% sample which was to some extent selected. On account of the language difficulties among many different nationalities and the constant movement in the trade in Soho, even this response was obtained only by considerable effort and personal visiting. There is no reason to suppose that the 45% who did not co-operate were any less likely to have tuberculosis. In fact, there must have been many who knew that they had tuberculosis or who were already attending clinics and who

deliberately avoided the survey for fear of losing their work as food-handlers.

We know of no other x-ray survey figures for the incidence of tuberculosis in catering workers in Great Britain. The only other similar surveys were done in the United States over 10 years ago (Martin *et al.*, 1934; Boucot and Sokoloff, 1948). The Report of the County Medical Officer of Health for London for the year 1959 (L.C.C., 1960) gives the tuberculosis notification rates for London workers in the "personal services" (among whom are the food and restaurant workers) as 2.1 per 1,000 males and 0.6 per 1,000 females. The rates for the general population of London are 1.2 per 1,000 males and 0.7 per 1,000 females. These figures indicate that, although tuberculosis is more common in catering workers generally than in the ordinary population, it is less than twice as common.

The present study not only confirms our expectation that pulmonary tuberculosis is more common in workers in the catering trade in Soho than in the general population, but also suggests that it is commoner among these workers in Soho than in those in the catering trade elsewhere. The incidence of active disease in Soho was found to be 8.0 per 1,000 workers. The most useful figure with which this finding can be compared is the incidence of active pulmonary tuberculosis found in the general public by the South-West London Mass X-ray Service in 1959; this was 1.8 per 1,000 persons x-rayed (F. A. Nash, 1959, personal communication). The definition of active tuberculosis used for such returns made by chest physicians to mass x-ray units is "tuberculosis requiring treatment or close clinic supervision." The phrase "close clinic supervision" has never been defined, and is interpreted differently by different physicians; the definition used in those returns is wider than the one used in this survey, and in the present context over-estimates the number of cases of active tuberculosis in the general population. Thus, comparison of this figure of 1.8 per 1,000 for the general population with the figure of 8.0 per 1,000 for the workers in the catering trade actually underestimates the increased incidence of the disease in these workers in Soho.

Active tuberculosis is therefore well over four times as common in workers in the catering trade in Soho as in the general population, and almost certainly more common than in the catering trade generally.

Some possible explanations for this high incidence were put forward in the introduction to this paper, but the results of the survey show that none of these simple explanations wholly accounts for the situation. Although the workers born in Great Britain have an incidence of active tuberculosis which is more than twice that found in the general population, the immigrants clearly account for most of the tuberculosis in the catering trade in Soho. Although the immigrants as a whole suffer from tuberculosis twice as commonly as the British-born workers, it is not just a matter of the immigrants arriving in this country with tuberculosis, because only about half the affected immigrants had the disease before joining the trade in Great Britain.

The Chinese and to a less extent the Italians and the Irish usually developed tuberculosis before joining the catering trade, and these are all countries with a high national incidence of tuberculosis according to the published mortality rates per 100,000 living persons for 1957-8. In Hong Kong the rate for that year was 103.0, in Italy 21.0, and in Ireland 24.0, compared with 8.9 in

England and Wales (Saliba, 1960). Active tuberculosis is apparently uncommon in West Indian immigrants; there was no active tuberculosis among the 272 West Indians in the present study, and only one showed inactive disease which he had before coming to Great Britain. In a mass x-ray study of 978 West Indians in North-West London, Brett (1958) found only two cases of active tuberculosis—an incidence no higher than that in the general population. The incidence of tuberculosis varies in the different islands of the West Indies, but in Jamaica the mortality rate was 24.0 per 100,000 in 1955 (K. Robson, 1960, personal communication), whereas the figure was 13.1 in England and Wales in the same year (Registrar-General, 1960). The disease appeared just as often before as after joining the trade in those from India and Pakistan, and in these countries the mortality rates for tuberculosis are also high (Heaf, 1957). It seems likely that most of the workers who come from any of these countries have usually already been infected before they arrive in Great Britain and join the catering trade.

The Cypriots, the British, and to a less extent the workers listed as coming from other European countries and elsewhere usually developed the disease after joining the trade. The tuberculosis mortality rates in Cyprus are low (Constantinides, 1958) and the prevalence of infection is low (Bardswell, 1939). It seems likely that many of the workers from these countries acquire their initial infection after joining the trade.

Some support for this idea comes from the incidence of active tuberculosis expressed according to the number of years spent in the catering trade in Table V. Because 10 of the 21 cases of active tuberculosis were Chinese from Hong Kong, and because Hong Kong has such a very high incidence of tuberculosis, the Chinese were considered separately from the other nationals. The fact that a high incidence of active tuberculosis was found among the Chinese who had been in the catering trade less than two years, as well as among those who had been here for longer, is strong evidence that many of those whose disease was active had their infection before entering the catering trade in this country.

In contrast there were no cases of active tuberculosis among any of the other nationals who had been in the catering trade less than two years. Their highest incidence was among those who had been in the trade between two and less than five years; this suggests that most of them arrive healthy or with inactive disease but break down within the first five years after their arrival.

Let us emphasize that we are now talking about all the workers other than the Chinese. There are two possible explanations for the described incidence of active disease in this majority group. The first is that the worker arrives already tuberculin-positive and then breaks down as a result of adverse conditions in the trade. This is possible but perhaps unlikely, because most of the workers have come from abroad to a higher standard of living in this country; it may apply to some of those workers from countries such as Italy and Ireland with a high national incidence of tuberculosis.

The second and more likely explanation is that many of the workers originating from countries with a low national incidence of tuberculosis, such as Cyprus, the United Kingdom, and other European countries, join the trade tuberculin-negative, but soon receive their primary infection in the pool of infection which undoubtedly exists in the trade.

It seems likely that if this survey were repeated the yield of tuberculosis would again be high because of the constant movement in the trade. The frequent changes in population probably ensure that the pool of infection is constantly fed by tuberculous workers coming from countries with a high national incidence of tuberculosis.

Much has been written about the advantages and difficulties of routine radiographic examination of immigrants to this country. So far as the catering trade in Soho is concerned, it would clearly be to everyone's advantage if this were carried out at least for the Chinese. As the incidence of tuberculosis is as high in those workers born in Great Britain as in the immigrants other than the Chinese, it is clearly advisable that all new employees in the catering trade in Soho should be x-rayed and tuberculin-tested and, where necessary, vaccinated with B.C.G. This we have already started to do for some of the Chinese restaurants.

Summary

2,611 workers in the catering trade in Soho have been x-rayed and at the same time interviewed and helped to complete a questionnaire. From the information obtained the following conclusions have been reached.

Tuberculosis is more than four times as common in the catering trade in Soho as in the general population and almost certainly commoner than in the catering trade elsewhere in Great Britain. The disease is commonest among alcohol-servers, food-preparers, and other kitchen staff. The overall incidence is 8.0 cases of active tuberculosis per 1,000 workers x-rayed. The disease is twice as common among the immigrants (9.6 per 1,000 x-rayed) as among those born in Great Britain (4.8 per 1,000 x-rayed). The Chinese, who come mainly from Hong Kong, have by far the highest incidence of active disease (53.8 per 1,000 x-rayed). They are responsible for the increased incidence in the immigrants as a whole. The incidence of active disease in immigrants, excluding the Chinese, was 4.4 per 1,000 workers, a lower incidence than in those workers born in Great Britain.

There is evidence that rather more than half the tuberculous workers have the disease before joining the trade, and the majority of these come from Hong Kong and to a less degree from Italy and Ireland, where there is a high national incidence of tuberculosis. Those tuberculous workers born in Great Britain and others from areas such as Cyprus, where the incidence of tuberculosis is low, usually join the trade healthy but develop the disease in the first five years after coming to this country and joining the trade.

It is considered that all new entrants to the catering trade in Soho should be x-rayed and tuberculin-tested, and where necessary B.C.G.-vaccinated, whether they come from abroad or were born in the United Kingdom. For the Chinese these precautions are especially necessary.

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ACUTE NEPHRITIS ASSOCIATED WITH CONGENITAL SYPHILIS

BY

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[WITH SPECIAL PLATE]-

Two clinical forms of renal disease have been described in association with congenital syphilis and early acquired syphilis; these are the nephrotic syndrome and a rare form of acute nephritis, but the latter has been poorly documented. Only two cases of acute glomerulonephritis associated with congenital syphilis are recorded in the English literature (Mitchell, 1951; Yampolsky and Mullins, 1945). In view of the rarity of the condition we describe two further cases of acute nephritis in association with congenital syphilis seen in the paediatric wards of the Baragwanath Hospital.

Case 1

A well-nourished 6-weeks-old male African infant was admitted with a two-day history of blood-stained urine. Before the onset of haematuria the baby was perfectly well, and there was no history of snuffles or skin rashes. On examination he was found to be pale and extremely irritable, with marked generalized oedema. There was an icteric tinge to the conjunctivae. The heart and chest were normal, and the systolic blood-pressure was 100 mm. Hg. by the flush method. The liver and spleen were each enlarged to 2 cm. below the costal margin in the mid-clavicular line, and bilateral regular kidney masses were palpated. Examination of the urine disclosed albuminuria ++++ and innumerable red blood cells and granular casts; an excess of bilirubin and urobilin was also present.

An intravenous pyelogram showed that the pelves of the kidneys failed to fill. Radiography of the femora revealed marked periostitis. Haemoglobin level 10.7 g. per 100 ml.; white cell count 52,000 per c.mm. (neutrophils 53%, lymphocytes 23%, monocytes 24%); prothrombin index 45%. Serum bilirubin 5.7 mg. per 100 ml., of which 4.1 mg. direct; blood urea 95 mg. per 100 ml., serum cholesterol 260 mg. per 100 ml. V.D.R.L. tests (Harris *et al.*, 1948) on both mother and child positive.

Treatment was begun with 250,000 units of crystalline penicillin six-hourly. During the next six days massive haematuria and albuminuria continued (results with Esbach's reagent varied between 1 g. and 5 g.), but the blood urea level fell to 54 mg. per 100 ml. On the sixth day the urinary abnormalities began to resolve; the liver had decreased in size and the spleen was no longer palpable. However, the patient became stuporous on the following day, and lumbar puncture revealed a purulent cerebrospinal fluid from which *Escherichia coli* was isolated. Despite vigorous antibiotic treatment he deteriorated steadily and died on the tenth day.

Post-mortem Findings

The body was oedematous, the oedema being most marked over the lower extremities. There was generalized pallor of the skin, and the hair was sparse and lighter in colour than normal. The heart showed moderate generalized enlargement and weighed 45 g. The kidneys were both markedly enlarged (right kidney 50 g.; left kidney 60 g.). The capsules stripped easily, leaving smooth but rather pale surfaces which had some retention of foetal lobulation. The cut surfaces of both kidneys showed marked pallor of cortex and medulla. Histological examination of the brain (520 g.) showed the presence of an acute suppurative leptomeningitis. Microscopical examination of the kidneys revealed marked changes in the glomeruli. These were swollen and showed endothelial and epithelial proliferation and infiltration by occasional neutrophils. Many glomeruli completely filled the glomerular space, and in some there were adhesions between tuft and Bowman's capsule. In addition there was slight focal thickening of the basement membrane. An occasional glomerulus showed focal eosinophilic necrosis (Special Plate, Figs. 1-3). Many tubules contained hyaline and granular casts and there were fine fat droplets in their lining cells. The blood-vessels were normal. The interstitial tissue showed an occasional focus of lymphocytic infiltration and extramedullary haemopoiesis. The histological features were those of an acute proliferative glomerulonephritis. Section of the femur failed to reveal any evidence of periostitis or epiphysitis. Spirochaetes were not isolated from any of the organs.

Case 2

An African female aged 2 months was admitted to the hospital with a history of swelling of the face and feet for one week. There was no history of haematuria, breathlessness, or cough. The mother's pregnancy had been uneventful, and delivery was at full term and normal. There had been no neonatal jaundice or cyanosis; the baby, who weighed 10½ lb. (4.65 kg.), was breast-fed.

Examination showed moderate oedema of the legs and puffiness about the eyes. Mucous membranes were moderately pale and there was no clinical jaundice. Mouth and pharynx were healthy and the heart and lungs normal. The abdomen was slightly distended, but no free fluid was present. The liver edge was palpable 2 cm. below the costal margin in the mid-clavicular line, and the spleen 1 cm. below the costal margin.

There was macroscopic haematuria and the urine contained a marked excess of albumin. Microscopical examination of the urine showed numerous erythrocytes and hyaline and granular casts. The haemoglobin level was 8.6 g. per 100 ml., and the white cell count 10,100 per c.mm. with a normal differential count. The mother gave a positive reaction to the V.D.R.L. test, but the baby's reaction was negative. Radiography of the baby's knees showed a typical syphilitic metaphysitis and periostitis. Further investigations showed: blood urea 26 mg. and serum cholesterol 245 mg. per 100 ml.; total serum proteins 5.5 g. per 100 ml., with albumin 1.3 g., α 1-globulin 0.39 g., α 2-globulin 0.85 g., β -globulin 0.92 g., and γ -globulin 2.04 g.; serum bilirubin 0.12 g. per 100 ml.; alkaline phosphatase 29.2 units per 100 ml.; thymol turbidity 10 units; zinc sulphate turbidity 3.2 units; thymol flocculation 2 units; zinc sulphate flocculation negative.