

Cancer in Blacks, Whites and Asians in a British Hospital

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Cancer is still the second biggest cause of mortality in the UK, accounting for over 20 per cent of all deaths. The overall impact of cancer has been greater in whites than non-whites and it has been suggested that this link is due to an increased risk from environmental carcinogens due to industrialisation[1]. However, Burbank and Fraumeni[2] have shown that cancer mortality is now greater in non-whites than in whites in the USA and this disparity is steadily increasing. This implies that some of these ethnic differences in cancer are of environmental rather than of genetic origin. Information relating genetic and racial differences to changes in environment can be obtained by studying the various types of cancer in migrant populations. One study of Japanese migrants in the USA showed a high mortality rate for gastric cancer, similar to that of their country of origin[3]. Second generation Japanese migrants had lower gastric cancer rates, although they were still higher than those of the native whites. Conversely, colonic and rectal cancer rates in these immigrants rose rapidly towards those of the native population. A similar trend for breast cancer[4], which became commoner in second generation Japanese migrants, suggests that cultural patterns have a greater influence than ethnic origin on the development of the disease.

Dudley Road Hospital serves a large community with a high number of Asians and blacks. We were struck by the few cases of cancer (of any type) seen in these two groups compared with the high incidence in whites. This provides a unique opportunity to study the incidence of cancer and any possible aetiological or histological differences between the ethnic groups; little information is available about cancer rates in the immigrant population of the UK.

Methods

Using the Hospital Activity Analysis (HAA) for the 12 years 1970 to 1981, we studied all new admissions to

Dudley Road Hospital of patients over the age of 30 years. We used the ICD code (9th edition)[5], taking all cases of cancer recorded in the principal, first, second and third diagnoses. The HAA diagnoses at our hospital are completed by the medical staff[6]. The following cancers were studied: lung (ICD code 162), breast (174), stomach (151), colon (153), rectum and sigmoid (154), pancreas (157), cervix (180), uterus (182), ovary (183) and bladder (188). The HAA forms do not record ethnic origin, so place of birth was used as a marker of ethnic group. In previous studies we have found this to be a reliable guide to ethnic origin for those aged 30 years and over and, in the records examined, only one case was found where place of birth did not indicate ethnic grouping. In only 1.8 per cent of all cases examined was place of birth not recorded. We have, however, no independent way of checking how many cases were not recorded. During examination of the records no false positive or negative cases recorded as cancer were found. Ethnic groups were recorded as: Asian—those born in India, Pakistan and Bangladesh, black—born in the West Indies, and white—born in the UK and Republic of Ireland. Patients born in Africa were not included in this analysis.

An approximate figure for the catchment population of Dudley Road Hospital and ethnic breakdown were calculated from the 1971 and 1981 censuses from information obtained from the Central Statistical Office using the Small Areas Statistics (Table 1). There has been a recent reduction in the catchment population caused by resettlement, reorganisation of the catchment area and expansion of a nearby District General Hospital, but the ethnic minorities still comprise nearly 15 per cent of the catchment population. We calculated crude incidence rates for the three ethnic groups for the periods 1970-74 and 1980-81 and also the age standardised incidence rates for the 1980-81 period for each type of cancer. We also looked at the ethnic breakdown of admissions for all causes to Dudley Road Hospital (excluding obstetrics and gynaecology) for the 12-year study period (Fig. 1).

Table 1. Ethnic breakdown of catchment area, males and females (>30 years). (Figures in brackets represent total catchment population.)

		White %	Asian %	Black %
1971	201,400 (355,000)	79.0	11.2	9.6
1981	153,000 (294,000)	85.0	8.9	5.3

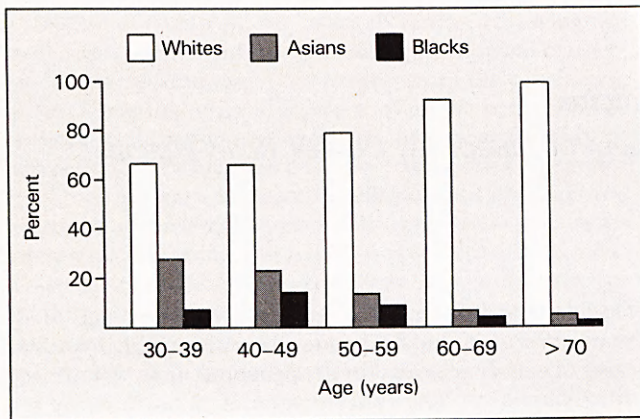


Fig. 1. Ethnic breakdown of admissions by age (>30 years), males and females. Yearly admissions >30 years = 13,500.

As lung and breast cancer are the most common types of cancer in males and females respectively in the UK, and two of the commonest found in India and the West Indies[7], we studied all hospital case notes for the Asian and black patients with lung and breast cancer and 50 age- and sex-matched cases for the Caucasian group.

Little data are available on the risk factors related to lung and breast cancer among the three ethnic groups and no reliable data could be obtained from these records. Some information on current smoking habits was obtained from a local factory screening survey of 753 black, Asian and white males and females[8]. We also looked at age, parity and breast-feeding habits from a survey of all women attending the Obstetric Department at Dudley Road Hospital during the year 1979[9].

Results

Despite a small decrease in our catchment population we were still able to compare the admission diagnoses in 8,180 black and 13,962 Asian patients, with 121,532 whites over the 12-year period. The ethnic breakdown of our catchment population closely mirrored our hospital admissions, suggesting that the results obtained are a true reflection of the population served by the hospital.

Figure 2 shows the 12-year incidence of gastric, pancreatic, colonic and rectal carcinoma. The most striking aspect was the very few cases of these cancers found among either of the two ethnic minority groups. The incidence of carcinoma of the stomach and pancreas in whites was virtually unchanged over the 12-year period,

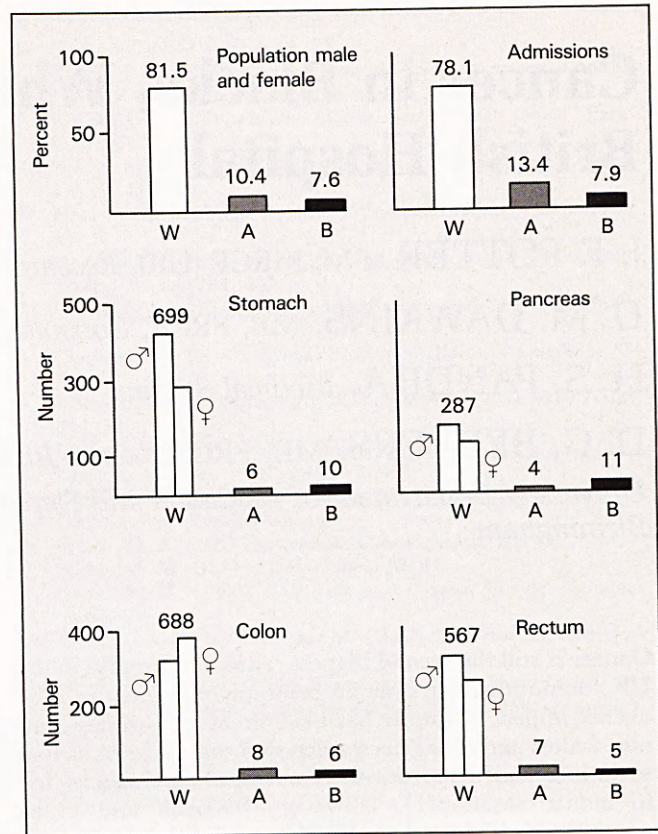


Fig. 2. Ethnic distribution of catchment population, hospital admissions and new cases of gastric, pancreatic, colonic and rectal cancer (1970-81). (W = white; A = Asian; B = black).

although incidence rates were higher than figures obtained from the Birmingham Cancer Registry[7]. However, carcinoma of the colon and rectum did show an increase during the period. An increased frequency of colonic carcinoma in females, as reported in UK national figures, was also noted. Under-representation among the blacks and Asians was seen for all four cancers and there was no obvious increase in the incidence rates during the study period.

Bladder and ovarian carcinoma were also infrequent among the two ethnic minorities, no cases of ovarian carcinoma being recorded in Asians (Fig. 3). This is unlikely to be due to inaccurate reporting, as the crude incidence rate for ovarian carcinoma in all groups had increased and was slightly higher than that for the Birmingham Cancer Registry[7]. Uterine cancer was also uncommon among Asians and blacks. One of the problems with hospital-based studies is that direct referrals may be made to specialised units at other hospitals outside the catchment area. This may have occurred with carcinoma of the cervix, and our figures for new cases may be slightly low as a result. However, this was one of the few cancers to show any significant numbers among the two ethnic minorities. Again there was no obvious increase in incidence during the 12-year period in any of the three groups studied.

There appeared to be a small increase in the incidence

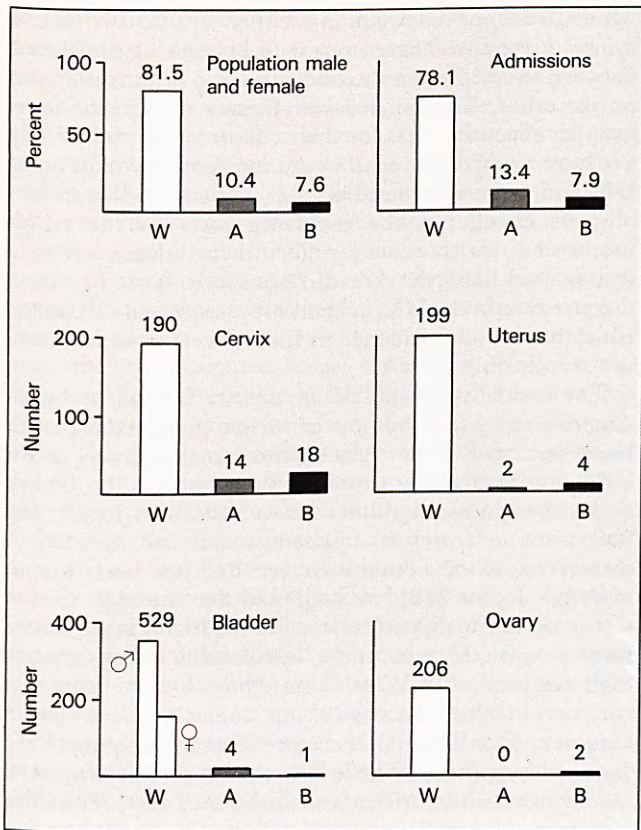


Fig. 3. Ethnic distribution of catchment population, hospital admissions and new cases of cervical, uterine, bladder and ovarian cancer (1970-81). (W = white; A = Asian; B = black).

Table 2. Age, sex and ethnic distribution of all cases of carcinoma of the lung at presentation (1970-81).

	Total	Overall M : F ratio		White		Asian		Black	
		M	F	M	F	M	F	M	F
1970-74	606	3.4		465	135	3	1	2	0
1975-79	717	3.8		557	143	9	0	5	3
1980-81	266	2.9		192	66	5	1	1	1
Total	1589			1214	344	17	2	8	4
Mean age (yrs)				65.6	64.1	53.5	52.0	60.5	59.0

Table 3. Ethnic breakdown of smoking habits and tumour histology of lung cancer patients. (Figures in brackets represent smoking habits of 753 factory workers.)

	Smokers %	Cigarettes/day/smoker median	Histological Types %				
			Epidermoid	Small Cell	Adenocarcinoma	Large Cell	Unknown
Whites	82.0 (52.8)	25.5 (20.5)	42.0	28.0	14.0	4.0	12.0
Asian	84.2 (40.8)	13.3 (15.0)	47.4	21.0	15.8	0	15.8
Black	83.3 (58.2)	12.5 (10.5)	50.0	25.0	0	0	25

of carcinoma of the lung, with a fall in the male to female ratio similar to that of other industrialised nations[10,11] (Table 2). Although there may be a small increase among Asians and blacks, numbers were too small to draw any firm conclusions. The overall age standardised rate (ASR) of 119.1 per 100,000 for males and 32.9 per 100,000 for females was higher than that for Birmingham Cancer Registry[7] and this may be accounted for by the high number of smokers and the low social class of patients in our catchment area. The mean age at presentation with cancer of the lung was nearly 13 years lower in Asians than it was for whites, the mean age for blacks being somewhere in between (Table 2). Other authors have noted lower age at presentation for Asians[12], although this could reflect the lower age distribution of the Asians in our catchment population. No differences were seen in the histological type in the three groups; as expected, the majority were squamous and small cell carcinomas[13]. The three adenocarcinomas in Asians all occurred in those with a previous history of tuberculosis. Table 3 shows the smoking habits of factory workers compared with the lung cancer patients. It shows that 40 per cent of Asian workers were smokers, and that more blacks smoked than whites, although they consumed fewer cigarettes per day. As expected, the incidence of smoking was high in the three ethnic groups with lung cancer.

There was no change in the incidence of breast cancer in any of the groups during the study and the age distribution and age standardised incidence rates were similar to those for the Birmingham Cancer Registry[7]. Our figures are therefore probably representative of the population (Table 4). Fewer cases of breast cancer were

Table 4. Ethnic distribution of breast cancer cases recorded over 12-year period (1970-81) in women (>30 years). (ASR = 52.0 per 100,000.) (Courtesy *Postgraduate Medical Journal.*)

	1970-1974	1974-1979	1980-1981	Total
Caucasian	316	386	113	815
Asian	7	7	3	17
Black	10	11	9	30
Others	18	2	1	21
Total	351	406	126	883

seen in either ethnic minority when compared to whites. However, the disease was more common in blacks than Asians, a reversal of the ratio seen in the total study population. As with lung cancer, Asians presented a mean of 12 years earlier, though there was little difference in the age at presentation between blacks and Asians (Table 5). Blacks and Asians with breast cancer tended to

Table 5. Age, parity and staging of breast cancer patients at presentation (> 30 years). (Courtesy *Postgraduate Medical Journal.*)

	Mean age years	Parity %			Stage of breast cancer %			
		0	1-4	>5	I	II	III	IV
Caucasians	60.7	15.3	76.5	8.2	46	24	16	17
Asians	48.3	0	75	25	27	7	20	46
Blacks	49.0	3	84	13	28	24	32	16

be more parous than whites and presented with more advanced disease, though no histological differences were seen between the three groups.

Information on age, parity and breast-feeding habits were obtained from mothers attending the Obstetric Department at Dudley Road Hospital during 1979, (Table 6). Less than half the Asians attending the clinic

Table 6. Ethnic distribution, age, breast feeding and parity of 3,996 mothers attending Dudley Road Hospital in 1979. (Courtesy *Postgraduate Medical Journal.*)

	%	Percentage <25 years	Breast feeding (%)	Parity (%)		
				0	1-4	>5
Caucasians	42.2	58.1	45	47	50	3
Asians	44.5	42.3	31	22	60	18
Blacks	10.4	66.1	82	41	52	7

were under the age of 25 years compared with nearly two-thirds of the Caucasians and blacks, though the Asians tended to be more parous. Strikingly, under one-third of Asians were breast feeding compared to nearly half the Caucasians and over 80 per cent of the blacks.

Discussion

Hospital based figures on diseases tend to be biased when compared with data from the surrounding population (Berkson's Bias)[14], so some differences would be expected when comparing our data with national or regional figures. Another source of error might arise from inadequate or inaccurate coding of discharge diagnoses in the HMR 1 document. The use of HMR 1 data in this hospital has, however, proved reliable in several studies[8,15], and while a measurable error rate occurs[6], this is less with definitive diagnoses like cancer. Therefore data from one centre, or from a small number of cases, should be interpreted with care. However, the high incidence rates of most cancers seen among the

whites was not seen among either of the two ethnic minority groups. There appear to be striking differences between the whites on the one hand and Asians or blacks on the other. The much lower figures seen in the latter groups reflect the rates for their countries of origin[7,16]. We have studied cancers that are common in whites in the UK and were interested to see if there had been any obvious change in the incidence rates in the ethnic minorities, which would reflect their adaptation to a westernised life-style. We did not study types of cancer that are rare in the UK, such as oropharyngeal carcinoma which has a high incidence in India, because so few cases are seen in this hospital.

The incidence of gastric carcinoma is high in Latin-America and Japan but low in Africa, intermediate levels being seen in Europe. Among the Japanese living in the USA the incidence is lower in those born in the United States than in immigrants who were born in Japan, and both rates are lower than Japanese national rates[17]. A dietary cause of stomach cancer has not been found, although Joosens[18] has suggested that the high rates of stroke caused by hypertension and the high gastric cancer rates may share a common aetiological factor, namely high salt intake. In West Birmingham hypertension was common in West Indians[19] but stomach cancer was not common. Our findings therefore lend no support to the Joosens' hypothesis. The lower rates of colonic and rectal carcinoma seen in Africa and India may be due to diets high in roughage[20], a low fat intake[21] and alteration of intestinal flora[22], though we have no information on such factors in our study population.

Prior to the 20th century, carcinoma of the lung was uncommon in Britain, but the incidence has increased to such an extent that the UK has one of the highest incidence rates in the world[23]. Recent evidence suggests that mortality from lung cancer is falling[24], though this is still the cancer most commonly seen in men. In India an increase in incidence has also been noted[12] but it may in part be due to better facilities for diagnosis. Although we noted a high incidence of lung cancer in the white population, the rate for Asians and blacks was much more in keeping with their country of origin. The prevalence of smoking in the lung cancer cases among Asians and blacks was as high as among the whites, suggesting that smoking was an aetiological factor in all groups. It is interesting, however, that in our factory study more blacks smoked than whites (though they consumed less than half the number of cigarettes per day) but they still had a markedly lower incidence of lung cancer. As in studies from the Indian sub-continent[25], we found a high ratio of male to female cases for Asians (8.5:1), although the current ratio for Bombay is lower, at 3.5:1[7]. The three Asian patients with adenocarcinomas had a history of previous pulmonary tuberculosis and were non-smokers. It has been suggested that bronchial carcinoma is associated with tuberculous scarring[26], but it is more likely to be a result of lowered immune defence mechanisms[27]. However, it is difficult to draw any definite conclusions on aetiology from the small number of cases in the ethnic minorities.

Our study's age standardised ratio for breast cancer

was only slightly lower than that quoted for the Birmingham Cancer Registry[7], which suggested that our figures are representative. The incidence of breast cancer among Asian and black immigrants is low compared with that of whites, and again is similar to that of their countries of origin. Asians and blacks presented at an earlier age than whites, although they had more advanced disease. This difference in age may reflect the younger age distribution of Asians and blacks in the population but it has been proposed that higher parity (as seen in these two groups) lowers the age of presentation[28] of breast cancer. Age at first birth and, to a lesser extent, parity appear to have a protective effect against breast cancer[29]. None of our Asians and only 3 per cent of the blacks with breast cancer were nulliparous compared with 15.3 per cent of Caucasians. The Asians presented with more advanced disease; this may be due to a more rapidly progressing malignancy or to delay in referral to hospital. One might expect to see changes in the obstetric habits among the immigrant populations. Our figures probably represent a mixture of those born overseas and in the UK but already few Asians appear to be breast feeding. Whether this, combined with a decrease in parity, and an increase in the ages of menarche and of first pregnancy, will influence the incidence of breast cancer remains to be seen.

This study, despite being hospital-based and retrospective, provides unique data about cancer incidence in an urbanised population with a large ethnic minority. Because of the small numbers involved, there are problems in drawing firm conclusions regarding aetiology of disease, but there is no reason to suspect that the small number of cancer cases seen among the Asians and blacks was due to their seeking medical advice outside our catchment area or not being referred to hospital. However, there could have been cultural barriers which prevented early clinical presentation. The incidence rates and types of cancers currently seen in the two ethnic minorities are more representative of their country of origin than of their adopted country. It will be interesting to see if the changes in incidence rates seen in immigrants to the USA will be reflected in subsequent generations of Asians and blacks born in the UK as they adopt westernised life-styles.

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