OESOPHAGEAL CANCER IN NATAL BANTU: A REVIEW OF 516 CASES*

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Carcinoma of the oesophagus has been shown in a recent survey to be the commonest cancer in Bantu males of Natal and is far more prevalent than in other countries.[1] Table I gives the incidence of cancer of the oesophagus in several South African groups, and in England and America.

TABLE I. STANDARDIZED MORBIDITY RATES* FOR OESOPHAGEAL CANCER

Population group	*Males*	*Females*
Durban Bantu (1964–1966)[1]	26·1	8·3
Pietermaritzburg Bantu (1964–1966)[2]	20·7	5·7
Rural Natal Bantu (1964–1966)[3]	10·3	1·7
Transkei, East London Bantu (1955)[4]	37·9	12·1
England and Wales (1960–1962)[5]	2·3	1·3
USA, New York State (1959–1961)[5]	2·1	0·5

*Rates/100,000 *per annum*. All rates are standardized to the African Standard Population.

A large number of cases of oesophageal cancer (516) were noted among Natal Bantu during the years 1964 - 1966, and the material pertaining to these cases is presented in relation to other studies under the headings: rising tendency, tribal affiliations, regional incidence, sex ratios, age distributions, percentage of all cancers, level of the growth, histological cell type, and survival periods.

RISING TENDENCY IN POST-WAR PERIOD

Oettlé[6] summarized the evidence which indicated that oesophageal cancer was not common in Bantu before World War II. The rising tendency in the occurrence of oesophageal cancer became noticeable in the decade 1950 - 1960 and continues to be apparent to those who work in Bantu hospitals. The rate measured by Higginson and Oettlé for Johannesburg Bantu residents[7] in the years 1953 - 1955 was 7·7 for males and 0·6 for females, but it is thought that a new measurement there today would show much higher figures.[8] Coetzee,[9] working at a large Natal midland hospital, noted a 6-fold increase in oesophageal cancer between the years 1953 and 1964.

The rising tendency in Natal is indicated further by the following comparisons:

Boulle and Kark,[10] working in Durban, noted that 117 Bantu cases of oesophageal cancer were admitted to a large Durban hospital in the 7 years 1952 - 1959. We note that during the 3 years 1964 - 1966 328 Bantu cases were admitted to the same hospital, which represents more than a 6-fold increase.

During the 7 years 1950 - 1956 inclusive, Wainwright and Roach[11] found 119 cases of oesophageal carcinoma in Bantu when reviewing all surgical and postmortem material for Natal. During the 3 years 1964 - 1966 inclusive, we note that the same sources revealed 270 cases. This represents a 5-fold increase.

This material is presented in Table II. This rough comparison shows that the increase is about 5-fold in both sexes, over the period of approximately one decade.

Factors such as better attendance at hospital and improved diagnosis may account for some of the increase, but as the hospital and pathology services did not change very substantially during the years which separate these surveys, it clearly cannot account entirely for the increase, and these comparisons indicate the rising incidence in Natal and the magnitude of the problem.

TABLE II. YEARLY AVERAGE OF OESOPHAGEAL CANCER OVER A DECADE IN NATAL

Series	*Males*		*Females*	
	Total	*Yearly average*	*Total*	*Yearly average*
Boulle *et al.* (1952–59 cases)	102	14·6	15	2·1
Present series (1964–66 cases)	273	91·0	55	18·3
Wainwright *et al.* (1950–56 hist.)	94	13·4	25	3·6
Present series (1964–66 hist.)	224	74·7	46	15·3
Average annual increase over the 10-year period	±14 to ±80		±3 to ±16	

PRESENT SITUATION

Tribal Affiliations

Bantu of Natal are mainly Zulus (93%—population census, 1960).[12] The racial composition of the Natal oesophageal cancer group is shown in Table III.

TABLE III. TRIBAL AFFILIATIONS IN 516 NATAL CASES OF OESOPHAGEAL CANCER

	Zulu		*Non-Zulu*		*Total*
Durban residents (158 cases)	*No.*	*%*	*No.*	*%*	*No.*
Male	117	86·0	19	14·0	136
Female	20	90·9	2	9·1	22
Rest of Natal (358 cases)					
Male	273	92·5	22	7·5	295
Female	62	98·4	1	1·6	63
All Natal (516 cases)					
Male	390	90·5	41	9·5	431
Female	82	96·5	3	3·5	85

There are more non-Zulus in the Durban group than in the group from the rest of Natal, as might be expected in view of the better opportunities for work offered in the Durban region, but the general disposition of Zulu and non-Zulu conforms to the tribal composition of Natal.

Bantu of the Transkei are Xhosas. Bantu of Johannesburg in Oettlé's study were a mixed group of several tribes. It is possible that tribal customs may be relevant to the high incidence in Xhosas and Zulus, and yet we have to explain the post-war increase, and the fact that oesophageal cancer is also common in Johannesburg.

Regional Pathology in Natal

The country districts of Natal (excluding Durban and Pietermaritzburg) have been examined[3] and it has been shown that oesophageal cancers are more prevalent in south and mid-Natal and less common in north Natal and the outlying areas than might be expected. This observation is of interest as the southern border of Natal abuts on the Transkei, which is well known to have a high incidence of oesophageal cancer.

*Date received: 27 August 1968.

Coetzee[9] considered that certain parts of north inland Natal had a high incidence but his observation was based on the case admissions to only one hospital.

Nevertheless, the highest Natal rates were found in Bantu of the Durban and Pietermaritzburg regions who are a fairly urbanized group, while the population-at-risk in the Transkei is largely rural. In view of the migratory pattern of Bantu labour in South Africa, we cannot say at present whether oesophageal cancer is related specifically to urban or rural life.

Sex Ratios

The preponderance of male cases is more marked in the Natal series than in Transkeian or British studies (Table IV).

TABLE IV. SEX RATIOS IN OESOPHAGEAL CANCER

	M:F	*Numbers*
Natal		
Boulle and Kark[10]	6·8:1	(102:15)
Wainwright and Roach[11]	3·8:1	(94:25)
Present series	5:1	(431:85)
Transkei		
Burrell[4]	2·5:1	(73:29)
Rose[13]	1·5:1	(65:42)
Britain		
Raven[14]	1·7:1	(1,475:850)

Age Distributions

The distribution of 516 oesophageal cancers by age is shown in Table V.

TABLE V. AGE DISTRIBUTION OF 516 OESOPHAGEAL CANCERS, NATAL SERIES, EXPRESSED AS PERCENTAGES

Sex	*Age-group in years*							
	15–24	*25–34*	*35–44*	*45–54*	*55–64*	*65–74*	*75+*	*Mean age*
Bantu male	0·2	3·5	19·5	28·5	30·4	13·5	4·4	54·14
Bantu female	2·4	2·4	16·5	25·8	31·7	20·0	1·2	54·97

The mean age for Bantu males was 54·14 years, and for Bantu females 54·97 years. These age distributions confirm the observation by Boulle and Kark[10] that the age of onset of this cancer is much earlier in Natal Bantu than in Raven's series in England. Raven[14] obtained a mean age of 69·74 years for males, and 69·04 years for females. The age of onset of our cases appears to be similar to that recorded by Boulle and Kark. The youngest case in the series was a Bantu female aged 18 years with a squamous carcinoma at 18 cm., and a tracheo-oesophageal fistula. The tendency to find younger cases was mentioned by Coetzee;[9] we have observed that the urban cases from the Durban region were younger than those in the series from the whole of Natal.

Percentage of All Cancers

Oesophageal cancer, in the years 1964 - 1966, formed 9·8% of all Bantu cancers in Natal. These percentages may be compared with the figures given by Wainwright and Roach of 6·1%,[11] with Burrell's figure for Transkeian Bantu of 14·7%,[4] and with Davies's report[15] of 3% for Kampala Africans.

As oesophageal cancer has such a high rate in Natal Bantu males, it may be useful to consider these percentages by sex. This cancer formed 18·3% of all Bantu male cancers in Natal (1964 - 1966) (19·8% of the males living in Durban and 17·6% of the group from the rest of Natal). This figure is almost identical with that obtained by Cohen[16] in a large series on Transvaal Bantu males. In the female Bantu, oesophageal cancer formed 4·6% of all cancers in Natal (6·2% of cancers in females resident in Durban and 4·2% of cancers in females from the rest of Natal). The percentages found by Raven[14] for England and Wales were 3·25% of all male cancers and 2·01% of all female cancers.

Level of the Carcinoma

In this series of 516 cases, the level of the growth is known in 370 cases (71·7%), measured in centimetres from the teeth to the upper edge of the lesion. The distribution of cancers at different sites is shown in Table VI. The thoracic oesophagus is the commonest site in both sexes, but the level of the growth appears to be higher in Bantu females.

TABLE VI. SITE OF OESOPHAGEAL CANCER IN 370 CASES, NATAL BANTU 1964–66

Region of oesophagus	*Male*		*Female*	
	%	*No.*	*%*	*No.*
14-19 cm.: postcricoid and cervical	4·6	14	12·3	8
20-25 cm.: upper thoracic	32·1	98	36·9	24
26-31 cm.: mid-thoracic	32·1	98	27·7	18
32-38 cm.: lower thoracic	28·2	86	21·6	14
39-40+ cm.: abdominal	3·0	9	1·5	1
Number of cases, all sites		305		65

Histological Cell Type

In this series of 516 cases, histological examination of biopsy or postmortem material was carried out in 411 cases (79·7%), while in the rest of the cases the diagnosis was made on radiological examination or clinical impression only. Analysis of the cell type showed that squamous-cell carcinomas were overwhelmingly predominant (Table VII).

TABLE VII. CELL TYPE IN 411 CASES OF OESOPHAGEAL CANCER

Cell type	*No. of cases*	
	Males	*Females*
Squamous-cell carcinoma	332	63
Adenocarcinoma	3	2
Undifferentiated carcinoma	9	2
Total	344	67

The majority of the squamous-cell carcinomas were well differentiated, and a large number showed keratinization.

Study of the site of the 5 adenocarcinomas showed that of the 3 male adenocarcinomas, one was at 23 cm., one at 25 cm., and one was in the abdominal oesophagus; of the 2 female cases with adenocarcinoma, one was in the abdominal oesophagus and the site of the other was not measured. Thus in 2 male cases we have found adenocarcinomata which are not near the gastric cardia, but this is a rare occurrence.

Survival Periods

Carcinoma of the oesophagus presents a well-defined and easily recognizable syndrome in Natal Bantu, the patients complaining of dysphagia for solids and later for liquids,

and loss of weight; the clinical impression is usually easily confirmed by barium-swallow radiological examination. The ease of diagnosis is unfortunately due to the fact that almost all cases are well advanced at the time of first presentation. As pain is not an early feature of the disease, the growth may go unnoticed for a long period, and survival periods once the diagnosis is made are very short.

Survival after first admission to hospital. In this series of 516 cases the date of first admission to hospital and the date of death are known in 242 cases (46·9%) and the period of survival is so short that it has been measured in days. Table VIII gives the percentage of cases where the period of survival was known, the average survival and the range of survival period.

The average duration of survival after first admission is seen to be in the region of 2 months in both sexes. These depressing figures represent the known survival period of under half the Natal cases in the 1964 - 1966 series. It may be argued that the remaining cases survived for longer periods, and that the outlook may not be as bleak as Table VIII suggests.

TABLE VIII. SURVIVAL AFTER FIRST ADMISSION TO HOSPITAL IN 242 CASES OF OESOPHAGEAL CANCER—NATAL CASES 1964 - 66

Sex	*No. of cases*	*% all cases*	*Average No. of days of survival and range in days*
Males	198	45·93	61·34 days (1 - 365)
Females	44	51·76	68·25 days (1 - 240)

If one considers the Durban region only, between 1964 and 1966 there were 158 cases of oesophageal cancer among Bantu residents, and the date of first admission and of death were known in 114 cases (72·1%) which gives a more complete follow-up. Analysis of this group shows a slightly longer period of survival after first admission, as is shown in Table IX.

TABLE IX. DURBAN BANTU RESIDENTS, 1964 - 66: SURVIVAL AFTER FIRST ADMISSION TO HOSPITAL IN 114 CASES OF OESOPHAGEAL CANCER

Sex	*No. of cases*	*% all cases*	*Average No. of days of survival and range in days*
Males	97	71·3	70 days (1 - 365)
Females	17	77·3	90·2 days (1 - 240)

In the remaining 44 cases from the Durban region, only the date of first admission of the cases was known and no survival period could be calculated. The evidence suggests that these cases retired to rural areas after diagnosis and treatment and died there, rather than that they represent a long-surviving group. However, in view of the fact that we do not have 100% follow-up, no absolute conclusions can be drawn.

Survival after various forms of treatment. In the Natal series, the type of treatment given was known in 203 cases, and the survival after onset of treatment (both average and range in days) is given in Table X.

From this table it can be seen that the terminal cases (almost a third of all cases), who were too ill to undergo operations and received nursing only, survived less than 4 weeks. The 4 cases given only X-ray therapy appeared to do well, but the series is very small. Of those in whom operations were undertaken, palliative operations gave better survival periods than more radical procedures.

TABLE X. SURVIVAL OF 203 CASES OF OESOPHAGEAL CANCER AFTER ONSET OF VARIOUS TREATMENTS

Treatment given	*Number of cases*		*Average survival and range in days*	
	Male	*Female*	*Male*	*Female*
All treatments	163	40	44·0 (1–335)	51·5 (1–217)
Nursing only	50	10	26·1 (1–105)	25·3 (1–95)
X-ray therapy only	3	1	85·0 (7–198)	147
Dilatation	18	8	65·7 (2–335)	29·6 (2–94)
Celestin tube	71	15	55·9 (1–287)	71·4 (3–217)
Gastrostomy	13	6	26·8 (1–60)	61·5 (2–169)
Radical operations	8	—	12·4 (2·36)	—

With most forms of treatment some died shortly after it was instituted, and some lived for several months. Although intubation was the treatment most favoured, the results were not much better than in the dilated group. It should be mentioned that X-ray therapy was also given to some patients who had undergone palliative operations but we have no further information about this group. The fact that most cases present for diagnosis at a very late stage is undoubtedly the main factor in the very poor results of surgery.

Survival in younger patients. The average over-all survival period and the average survival period after intubation is longer in younger cases as Table XI shows, and may be due to the fact that the younger patients are less advanced and better able to withstand operative procedures.

TABLE XI. AVERAGE SURVIVAL IN DAYS, OVER-ALL AND AFTER INTUBATION, IN DIFFERENT AGE-GROUPS AND SEXES, NATAL BANTU 1964–66

	Average survival after 1st admission				*Average survival after intubation*			
	Male		*Female*		*Male*		*Female*	
Age-group	*No. cases*	*Survival in days*	*No. cases*	*Survival in days*	*No. cases*	*Survival in days*	*No. cases*	*Survival in days*
15–34	7	104·9	3	109·3	4	107·0	1	217·0
35–44	42	72·8	8	121·1	15	68·1	6	96·3
45–54	48	64·8	12	57·2	16	56·6	3	22·3
55–64	62	57·3	16	53·9	18	69·9	3	52·3
65+	39	43·4	5	31·6	18	20·0	2	26·0
All ages	198		44		71		15	

CONCLUSION AND SUMMARY

An analysis of a series of 516 oesophageal cancer cases in Natal Bantu collected between 1964 and 1966 is presented. Comparison with earlier studies in Natal confirms the rising tendency in the incidence of this cancer, which appears to have increased 5-fold in the last decade.

Most Natal Bantu are Zulus, and the frequency among Zulus is as remarkable as Burrell's work showed it to be among Xhosas. Sex ratios showed that male predominance is more marked in Natal than in the Transkei.

Oesophageal cancer is the commonest cancer among Natal Bantu males, comprising 18·3% of all male cancers. It is less common among Natal Bantu females and comprises only 4·6% of all female cancers. The age incidence rises to a peak in the age-group 45 - 64 years, which is much earlier than in Britain. The age of onset is earlier in the urban population.

The commonest site in the oesophagus is the thoracic oesophagus, but the level of the growth tends to be higher in females. The prevailing histological cell type is squamous carcinoma, the majority of tumours being well-differentiated.

Survival after first admission to hospital is short. Although no complete follow-up is available, the average survival after first admission appears to be in the region of 2 - 3 months. Intubation, dilatation and gastrostomy are the favoured methods of treatment, and at present they offer slightly longer survival periods than more radical procedures. Survival after admission, and after intubation, is longer in the younger patients, who are better able to withstand operative procedures, and may be at an earlier stage of the disease.

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