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Brain Tumours in Malawi, Rhodesia and Zambia

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Summary. This paper is a comparative study of the expanding intracranial masses seen in the African and European populations of Malawi, Rhodesia and Zambia during the 15 years between January 1957 and December 1971 inclusive. Meningiomas accounted for 21% of all the total of 258 space-occupying lesions seen among the Africans and 12% of the 305 cases seen in the European population. On the other hand, the incidence of astrocytomas was 15 and 30%, respectively, in the African and European populations. Tuberculoma which formed 14% of the intracranial masses in the Africans was not seen at all in the Europeans.

While there appears to be no racial difference in the anatomical location of these tumours, one major point of contrast was that the tumour size was much larger in the African than in his European counterpart.

Résumé. Ce teste est une etude comparative des masses intra-craniennes rencontrées parmi les populations africaines et europeennes en Malawi, Rhodesie et Zambie durant les 15 années entre janvier 1952 et decembre 1971 compris. Les meningiomes comptaient pour 21% du total des 258 lésions dans es espaces rencontrées parmi les africains et 12% des 305 cas rencontrés dans la population europeene. D'un autre cote l'incidence des astrocytomes etaient de 15 et 3% respectivement dans les populations africaines et europeenne.

Le tuberculome que formait 14% de masse intra-cranienne chez les africains ne se rencontrait pas du tout chez les europeens.

Pendant qu'il n'apparait aucune difference raciale sur la localisation anatomique de cette tumeur, un point majeur de contraste etait que la taille de la tumeur, etait beaucoup plus grande chez les africains que chez les europeens.

The author began the establishment of a neurosurgical facility in Salisbury for the three territories that comprised the then Federation of Rhodesia and Nyasaland, 15 years ago. The subsequent division of the Federation into Malawi, Rhodesia and Zambia has entailed significant modification and much surgery has had to be performed on an itinerant basis.

The last few years have seen great strides in the development of the Medical School in Lusaka, with a new teaching hospital almost complete, and neurosurgery may now be

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established in its own right and as a speciality in Zambia. In Malawi, much preparation toward this stage is still needed.

These three territories have provided the opportunity for a very interesting comparative study of disease as it affects two of the races of mankind because although the vast majority of the inhabitants are of African descent, there is nonetheless a considerable population of

TABLE 1. Classification of 258 African and 305 European brain tumours or space-occupying lesions

	Africans		Europeans	
	No.	%	No.	%
Meningioma	54	21	37	12
Astrocytoma (Supratentorial)	39	15	92	30
Grade I	5		8	
Grade II	5		17	
Grade III	6		34	
Grade IV	23		33	
Unclassified glioma	4		5	
Ependyoma	12	(inc. 4 (4.6) posterior fossa)	7	(inc. 4 (23) posterior fossa)
Astrocytoma of the cerebellum	11	4.3	12	4
Hemisphere	6		6	
Midline	5		6	
Medullo-blastoma	14	4.6	11	4
Acoustic neuroma	1	0.4	7	2.5
Posterior fossa tumours	—		2	
Metastatic carcinoma	26	(inc. 4 (%) posterior fossa)	67	(inc. 4 (23) posterior fossa)
Pituitary tumours	17	6.5	22	7.2
Craniopharyngioma	8	2.5	5	2
Polar spongioblastoma	—		3	
Schwannoma	1		1	
Malignant melanoma	2		7	
Sarcomata (various ? primary)	—		8	2.4
Dermoid cysts	1		4	
Eosinophilic granuloma	—		1	
Hemangio-endothelioma	1		—	
Arachnoida inclusion cysts of brain	—		3	
Tuberculoma	36	14	—	
Blastomycotic granuloma	1		—	
Brain tumour. Suspects or type undiagnosed	29		6	
Total	258		305	

European origin. The neurological service in Salisbury has provided facilities for members of all races, and in consequence, this communication not only deals with tumours of the nervous system seen in the African population, but also attempts to make comparisons between them and those seen amongst the European population of these territories.

During the 15 years from January 1957 to December 1971 inclusive the author has undertaken 4830 neurosurgical operations. Of these, 3158 were undertaken on African patients, 1672 on European patients, 258 expanding intracranial masses were seen in Africans, 305 were seen in Europeans. The vast majority of these tumours were diagnosed histologically, either by resection or biopsy. A few, such as a very obvious metastasis from an established carcinoma of the lung or elsewhere, were diagnosed by inference since one would not wish to operate on such a patient. In the European group a slightly higher percentage was diagnosed by inference since metastases of the brain and malignant neoplastic growths are so much more common in that group. Many of these patients were subsequently subjected to a post-mortem examination which confirmed the clinical diagnosis.

There were fifty-four meningiomas in our 258 African patients making 21% of all our space-occupying lesions. By contrast there were thirty-seven meningiomas in 305 European space-occupying lesions which formed 12% of the total. There is no difference as far as side is concerned, left and right hemispheres being equally affected in both races, and there is no significant difference in regard to distribution. There is, however, a very significant difference in the size of the tumour; that which is seen in an African patient always being much larger than that which is seen in a European patient. This is purely a cultural and educational difference and has no significance whatsoever as far as neoplasia itself is concerned.

It has, however, a very significant difference in relation to the prognosis. Of our African patients 34% are dead either as a consequence of the operation or of our inability to remove the entire tumour. Of our European patients 16% are dead. It is understandable that a man from the rural areas with a long distance to travel and tremendous fear in his heart as to what may happen to him in hospital is going to arrive much later and in a much more perilous state than does an educated man. Despite this difference, however, enormous meningiomas have been seen in both races, and there is no doubt that they are an extremely insidious tumour, sometimes assuming a quasi-malignancy as they wrap themselves around nerves and arteries inside the cranium. One such enormous meningioma was successfully removed in three stages in our Clinic. Staged operations, as far as one can see, are the only way to let out these enormous masses.

There were thirty-nine African patients and ninety-two European patients with malignant astrocytomas. The distribution in relation to malignancy is virtually identical in both race groups, Grades 3 and 4 being almost three times as common as Grades 1 and 2. Allowing for the difficulties that there are in judging the site of the tumour and the fact that naturally an infiltrative lesion of this type spreads into many areas, there are, as far as I can see, no differences in the location of the tumours in Africans and Europeans. One wonders why we have seen more than twice as many European astrocytoma patients as African patients and this must be a function of the expectation of life. As far as is known, the expectation of life of rural people is in the 40's, while that of Europeans is in the 60's. It is understandable, therefore, that malignancy will be more common in this latter group. Reliable estimates of the overall incidence of malignant neoplasia in Africans are not available at present let alone a comparative study with European on an age-to-age basis.

TABLE 2. Classification of metastases to the brain by primary site

	Africans	Europeans
Bronchus	8	29
Breast	2	9
G. I. tract	1	4
Uterus	—	4
Pancreas	—	3
Gall bladder	—	1
Chorionepithelioma	—	2
Kidney	1	—
Prostate	—	3
Unknown	4	10
Ovary	1	—
Liver	3	—
Retinoblastoma	1	—
Larynx	—	1
Total	26	67

In the same way metastatic disease of the brain is much more common in Europeans than Africans, and, needless to say, reflects the different patterns of primary neoplastic disease.

In discussing such metastatic neoplastic disease, emphasis is placed not on those cases of obvious spread to the brain as a terminal event in a long-standing previously diagnosed sickness; but those in which the central nervous system is the first evidence of disease, or if neoplastic disease has been present before, there is sufficient doubt about things for one to feel the need to investigate the patient rather fully. To some extent, therefore, these figures are loaded by one's personal opinion of the case, that is in deciding which patients who have had previous malignancy warrant further investigation of a subsequent intracranial upset. In all of the three categories the relationship of the figures for the primary site, one with another, would vary very much.

It is clear that carcinoma of the bronchus is easily the commonest primary site in both race groups—a phenomenon observed throughout the world, and in all of these cases the cerebral signs were the first to make their appearance there was no hint of the primary lesion when the signs appeared. Cancer of the breast is next. The majority were old cases in which a cure had apparently been obtained and the intracranial systems, therefore, warranted investigations in their own right. Amongst the smaller groups the relative absence of gastrointestinal and urogenital neoplasms in Africans is interesting; and of particular note is the absence of chorionepithelioma in Africans, a fact that will probably surprise our colleagues from West Africa. Hepatoma was the primary site in three African cases. It was not seen in Europeans.

It is strange to note that in Europeans a melanoma was found intracranially seven times as a first site of declaration, while in Africans, in whom it is a much more common tumour, we only found it twice. In the same way eight intracranial sarcomata, apparently primary, were found in Europeans; they have never been seen in an African patient. By contrast there are some tumours in which there is no difference whatsoever between the race groups.

Pituitary tumours, for example, form about 7% of tumours in both groups, and of all those that have been examined histologically about 60% have been chromophobes.

Neoplastic tumours of the posterior fossa are every similar. Astrocytomas, for example, were equally divided in both groups between hemisphere and midline. There were eleven such African patients and twelve Europeans. There were fourteen African medulloblastomas and eleven Europeans. Four ependymomas and four metastatic carcinomata appeared in both groups. The only difference, in fact, between the two groups were the ten posterior fossa tuberculomas which were seen in the African patients, and only one of these tuberculomas occurred in a child. Thus the posterior fossa lesions do not really vary between the races in children.

Finally, the one large group of space-occupying lesions that always have to be considered is the tuberculomata. This constituted 14% of space-occupying lesions in Africans—none in Europeans. This difficult problem, however, will be considered in a separate communication.

CONCLUSIONS

The situation regarding tumours of the brain in the African and European races in Malawi Rhodesia and Zambia have been reviewed at length. As far as I can make out from the standpoint of the two race groups that I have attempted to study here, the only difference to be noted is the fact that older people have a greater tendency towards malignancy than younger people and, therefore, there are more malignant growths in the European group than there in the African group. There seems to be no difference in the location of the tumours and, indeed, the only difference that I can see are in the question of tumour size and, of course, the patient's ability to withstand a major surgical procedure. A man who is in poor health and who is suffering extensively from bilharzia and other parasitic disorders is, needless to say, not going to be able to withstand a major neurosurgical procedure well. This is a very important factor in the greater death rate that there has been amongst African patients than there has been amongst European patients. In addition, there is the factor of sheer size. It is obviously not so easy to get a large tumour out as it is to get a small one.