

Burkitt's lymphoma in the Sudan

B. VERESS, M. O. A. MALIK, A. A. SATIR AND A. M. EL HASSAN

Department of Pathology, Faculty of Medicine, University of Khartoum, Khartoum, Sudan

Summary

During the period 1962-73 twenty-nine cases of Burkitt's lymphoma were seen and examined histologically in Khartoum, Sudan. Burkitt's lymphoma formed 20% of the cases of childhood lymphomas. The average age at presentation was 6.8 years and the male to female ratio was 3.8:1. The clinical features, the anatomical localization and histological appearances were similar to those reported in the literature. The geographical distribution of the tumour showed close correlation to that of holo- or hyperendemic malaria.

Résumé

A Khartoum durant la période 1962-1973, nous avons vu et examiné 29 cas de lymphoma de Burkitt.

La lymphoma de Burkitt constitué 20% des cas de lymphoma de l'enfance. L'âge moyen étant de 6,8 ans et la proportion garçons:filles 3.8:1.

Les aspects cliniques, la localisation anatomique et les aspects histologiques sont similaires à ceux rapportés dans la littérature.

La distribution géographique montre une relation étroite avec celle de la malaria endémique.

Burkitt's lymphoma was first reported in the Sudan in 1962 when Lynch and El Hassan described three cases. In the next decade twelve more cases were reported (Nabri, 1964; El Hassan, 1967; El Sheikh *et al.*, 1971). These fifteen cases were all in patients from the Southern Sudan with the exception of one patient who came from the western part of the country. The present communication describes the

clinico-pathological features of all the twenty-nine cases of Burkitt's lymphoma verified clinically and histologically in the Sudan up to date.

Material and methods

The cases were collected from the biopsy and autopsy records of the University Department of Pathology and the National Health Laboratory during the period 1962-73. The clinical and morbid anatomical details were obtained from the case sheets and the pathology reports and all available histological preparations were re-examined. In addition to the routine haematoxylin and eosin, special stains were done including PAS, methylgreen-pyronin, Sudan IV stainings and silver impregnation. Imprint preparations (Wright, 1970) were stained with May-Grunewald-Giemsa.

Results

General frequency ratio

During the period under study 715 biopsies of malignant lymphomas were reviewed (8-9% of total cancer). Out of those, 135 (18.8%) occurred in childhood (0-14 years), the distribution of which is shown in Table 1. It can be seen that there were twenty-seven cases of Burkitt's lymphoma forming 20% of all the childhood lymphomas.

Furthermore, two cases of Burkitt's lymphoma have been seen at autopsy during this period and are included in this survey.

Geographical distribution

This is shown on the map (Fig. 1).

Correspondence: Dr B. Veress, P.O. Box 102, Department of Pathology, Khartoum, DR of the Sudan.

TABLE 1. Distribution of childhood lymphomas in the Sudan during the period 1962-73 (biopsies)

	Lymphocytic lymphoma	Histiocytic lymphoma	Hodgkin's disease	Burkitt's lymphoma	All types
Number of cases	68	5	35	27	135
Percentage	50.3%	3.8%	25.9%	20.0%	100%

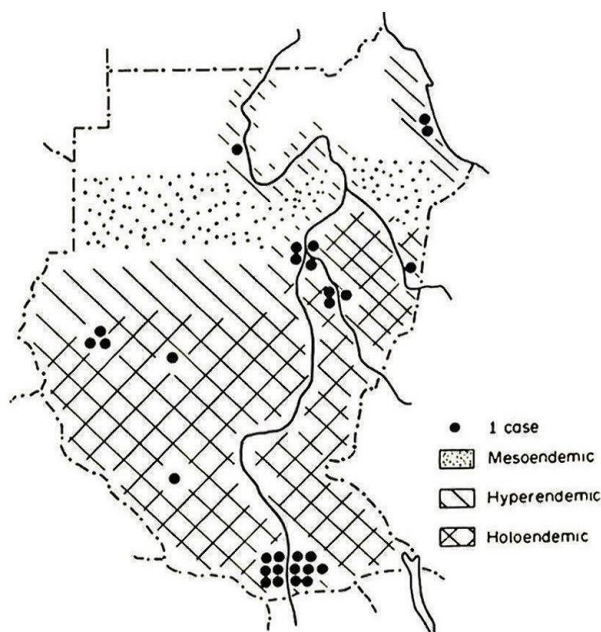


FIG. 1. Map showing the distribution of cases of Burkitt's lymphoma and malaria in the Sudan.

Age and sex incidence

This is shown in Fig. 2. The average age at presentation was 6.8 years and the tumour did not occur below the age of two. The male to female ratio was 3.8:1.

Clinical features

The site of the tumour was multicentric in origin in seventeen cases (58.6%). Different parts of the maxilla and mandible were involved in all cases with the exception of one. In four patients the orbit was infiltrated resulting in unilateral proptosis. The ovaries were the site of origin in five cases (17.2%). In both autopsies the tumour was found in the mandible, maxilla, kidneys and mesenteric lymph

nodes while in one case the thyroid, liver and both ovaries were involved as well.

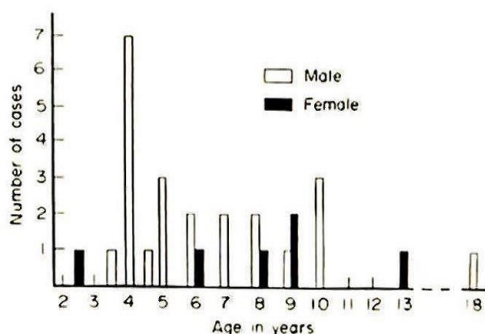


FIG. 2. Showing the age and sex distribution of Burkitt's lymphoma.

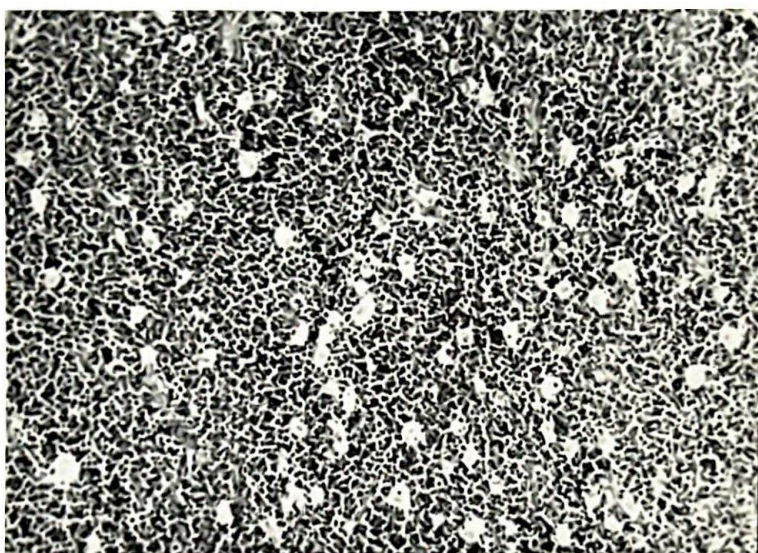


FIG. 3. Showing 'starry sky' appearance of Burkitt's lymphoma. (H & E, $\times 60$)

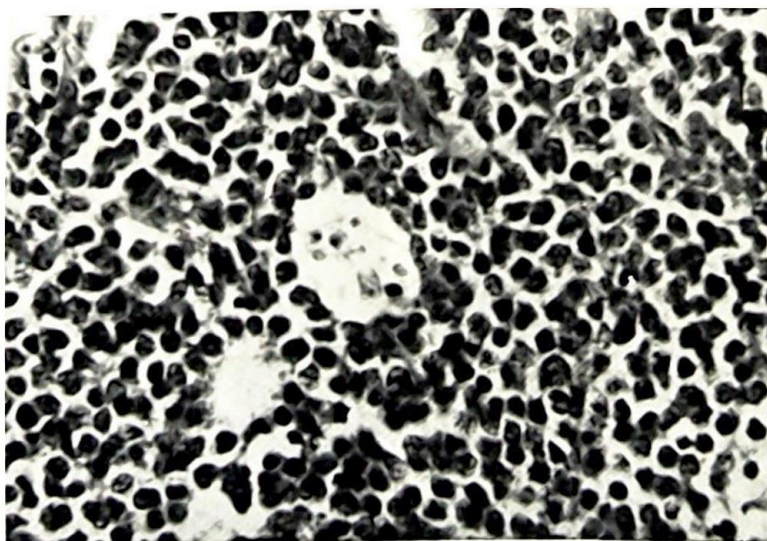


FIG. 4. Detail of the tumour with a large histiocyte engulfing cellular debris and the lymphoid cells. (H & E, $\times 320$)

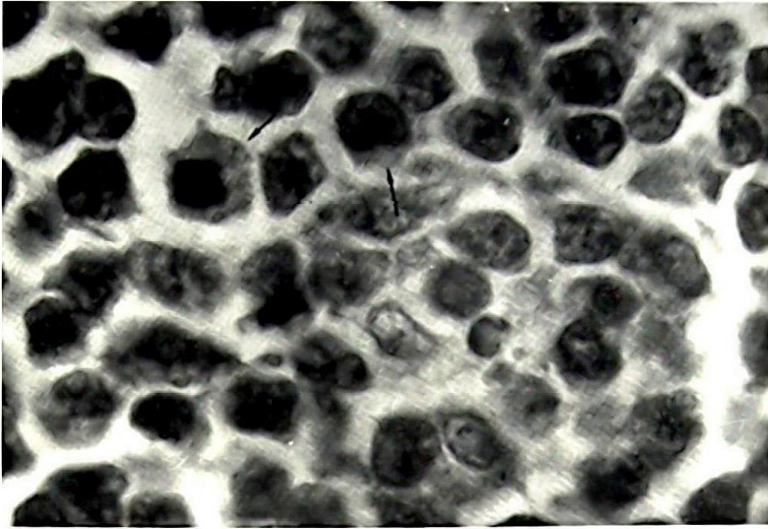


FIG. 5. The lymphoid cells have vacuolated cytoplasm and indented nuclei (arrow). (H & E, $\times 900$)

Apart from the presence of a huge swelling the general condition of the patients was surprisingly good. Ulceration was noted in two cases only, in both occurring over the mandibular region. Otherwise the skin covering the tumour was easily moveable. In some patients the teeth were displaced and loosened. Pain was not a feature in our cases. Radiological investigation showed osteolytic foci in the bones involved with erosion of the cortical bone.

Pathological changes

Grossly the tumour was softish showing haemorrhages and necrosis in some areas. Microscopically the typical 'starry sky' appearance could be observed (Fig. 3) consisting of sheets of uniform, small lymphoid cells with intermingling of scattered histiocytes engulfing cellular debris and nuclear fragments (Fig. 4). The lymphoid cells had indented nuclei and vacuoles in the cytoplasm (Fig. 5). Mitotic figures were also seen. The cytoplasm was pyroninophilic and contained lipid droplets. Occasionally, small PAS positive granules were also found. Reticulin staining did not reveal any reticulin fibres

produced by the tumour cells; however, thick fibres and those around the vessels were demonstrated.

Discussion

Burkitt's lymphoma has three main characteristics (Burkitt, 1970a): (1) close correlation with certain age groups (3–12 years); (2) typical anatomical localization: involvement of the jaws, ovaries, thyroid, kidneys with infrequent affection of superficial lymph nodes; (3) particular geographical distribution (high incidence in Africa's 'lymphoma belt' with relationship to the annual rainfall, certain altitude and malarial regions).

The age distribution of our cases is similar to that reported by other authors (Edington & MacLean, 1964; Burkitt, 1970a). Of the twenty-nine patients, twenty-two were between 4 and 9 years of age and the tumour did not occur below the age of 2 years. The male to female ratio was only slightly higher than that found by Burkitt in Uganda (1970a). The anatomical localization and clinical presentation as well as the histological appearances were also similar to those reported elsewhere (O'Connor, 1961; Edington & MacLean, 1964; Burkitt, 1970a; Wright, 1970).

The present study showed that out of twenty-nine patients, fourteen came from the Southern Sudan whereas fifteen patients were from the Central, Western and Eastern regions of the country. The annual rainfall in these three latter territories is on average only about 400 mm and the average height above sea level is no more than 1000–1500 ft. However, there is one common feature between these three areas and the Southern Sudan: all of them show a high incidence of malaria—either hyper or holoendemic type (Anis, 1968). This might well be an aetiological co-factor in the development of Burkitt's lymphoma and similar views have been expressed by other authors (Dalldorf *et al.*, 1964; Burkitt, 1970b; Sudarsanam *et al.*, 1971).

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