CASE REPORT

Burkitt's lymphoma patients in Northwest Cameroon have a lower incidence of sickle cell trait (Hb AS) than healthy controls

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Contradictory findings have been reported from Africa with regard to the risk of developing Burkitt's lymphoma (BL) in sickle cell trait (AS) carriers. Haemoglobin electrophoresis was performed in 78 BL patients in the Northwest region of Cameroon, and in 78 nearest-neighbour controls of the same age, sex and tribe from the same village. AS was confirmed in 4 of 78 (5.13%) BL patients and in 11 of 78 (14.10%) controls (χ^2, p=0.052; Fisher's exact, one-tailed, p=0.050). Sickle cell trait carriers had a marginal statistically reduced risk of developing BL.

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Burkitt's lymphoma (BL), the most common childhood cancer in sub-Saharan Africa, occurs mainly in areas with holo-endemic malaria.[1] Young children with haemoglobin (Hb) AS (sickle cell trait) are largely protected against severe *Plasmodium falciparum* malaria.[2] The prevalence of AS in the Northwest region of Cameroon, a holo-endemic malaria area, is between 10% and 30%.[2] The annual incidence of BL between 2003 and 2010 was 2.58/100 000 children <15 years of age, and the monthly average of malaria cases was 10 938 in the dry season and 11 499 in the rainy season.[3] It is hypothesised that the AS trait lowers the risk of developing BL.

One hundred Nigerian Yoruba children with BL had a significantly lower incidence of the AS genotype than hospital controls. No difference in frequency of AS was, however, subsequently observed between 306 Kenyan children with BL and age-, ethnically and geographically matched controls.[4,5]

We observed an AS incidence of 7% in 167 BL patients treated in Cameroon,[6] and subsequently conducted a prospective study in surviving BL patients resident in the Northwest region.

Methods

Seventy-nine BL patients in the Northwest region of Cameroon were visited at home, where a nearest-neighbour control of the same tribe, age and sex was identified. One parent of a patient with BL refused consent. An ethylenediaminetetra-acetic acid (EDTA) venous blood sample was obtained from the index patients and controls, and paper electrophoresis was performed at pH 8.9 in boric and trisaminomethane (TRIS) buffer. Institutional review board approval and informed parental consent were obtained.

Results

The 79 BL patients included 41 girls and 38 boys aged 4 - 17 (mean 9.9) years. Controls had a similar age and gender distribution. Four (5.13%) BL patients had AS compared with 11 (14.10%) controls (χ^2 (df=1)=3.74, p=0.052; Fisher's exact, one-tailed, p=0.050) (Table 1).

Table 1. Observed frequencies of Hb AA and Hb AS

Subjects	Hb AA	Hb AS	Total
Patients, *n*	74	4	78
Patients, %	94.87	5.13	
Controls, *n*	67	11	78
Controls, %	85.9	14.10	
Total	141	15	156

χ^2 (df=1)=3.74, p=0.052; Fisher's exact, one-tailed, p=0.050.

Discussion

The validity of the Nigerian study[4] was later questioned because controls were not from the same tribe, region and village. It is not clear whether controls in the Kenyan study[5] were carefully matched for age and if they were indeed nearest-neighbour controls. This is of critical importance because of large differences in the distribution of the AS gene.

Conclusion

The relatively small number of patients studied limits the statistical significance of our findings. This study of confirmed BL patients and very well-matched controls did, however, demonstrate that AS carriers in Cameroon probably have a reduced risk of developing BL. Further studies in this regard are justified.

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