**Background:**

Endemic Burkitt's lymphoma (eBL) has been associated with Epstein–Barr virus (EBV) and holoendemic *Plasmodium falciparum* malaria. But recent evidence suggests that other risk factors are involved.

**Methods:**

We hypothesised that selenoprotein glutathione peroxidase (GPx), a surrogate of nutritional status, is an important biomarker for eBL risk. We measured plasma GPx, anthropometric markers of malnutrition, EBV viral loads and malaria parasitaemia in children aged 1–9 years (*n* = 258) from two locations in Nyanza Province, Kenya, with higher-than-expected and lower-than-expected incidence of eBL. The study participants were malaria asymptomatic children from the community.

**Results:**

Children from eBL high-incidence areas had significantly lower GPx levels, high EBV viral load and more evidence of chronic malnutrition than children from eBL low-incidence areas (all *P* < 0.001). Additionally, GPx levels were significantly lower in children with the highest EBV viral load and for those with *P. falciparum* infections (*P* = 0.035 and *P* = 0.004, respectively).

**Conclusions:**

These results suggest that selenium deficiency may be a risk factor for eBL.