Introduction

Environmental enteropathy (EE), originally termed tropical enteropathy, is very common in overcrowded living conditions in developing countries. It predisposes to growth failure in the young, and probably to poor performance of oral vaccines. By permitting microbial translocation it probably contributes to insidious systemic immune activation. In order to understand the impairment of barrier function in EE, we performed confocal laser endomicroscopy (CLE) in 62 healthy volunteers from a poor community in Lusaka, Zambia.

Methods

These asymptomatic volunteers were drawn from a community in Misisi with which we have been conducting studies for 15 years. On day 1 a 3 h lactulose:mannitol permeability and zinc absorption test was performed. On day 2 CLE of the duodenal mucosa was performed with diazepam/pethidine sedation and 5–10 ml 2% intravenous fluorescein, and images collected for 10 min exactly (mean number of images analysed 135, SD 57). Biopsies were subsequently taken to assess villous morphology and tight junction protein expression (data not yet available).

Results

In the first 22 volunteers (12 female, 10 male) studied, a wide range of villous architectural patterns was observed from leaf-like to convolutions. Similarly, a wide range of barrier abnormalities was observed, with some volunteers showing severe fluorescein leakage within one minute of fluorescein injection. Epithelial breaks, particularly multicellular breaks termed microerosions, were strongly correlated with the rate of fluorescein efflux (Spearman’s rho 0.92; P < 0.0001). The number of plumes was almost as strongly correlated (rho = 0.69; P = 0.0004). All volunteers showed some abnormality, with Watson grade = 3 in all cases, corroborating our previous reports that EE is ubiquitous in this population. We also observed that fluorescein leakage and epithelial barrier defects were not correlated with villous architectural change (rho = 0.01; P = 0.96), suggesting that villous remodelling and barrier defects are differentially determined.

Conclusion

CLE permits imaging of small intestinal epithelial barrier defects and suggests that cellular breaches are major routes of intestinal permeability but independent of villous architecture.

Disclosure of Interest

None Declared.

Environmental Enteropathy: Imaging the Cellular Basis of Disrupted Barrier Function

PTU-036

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