

Abstract

Background:

Altered susceptibility to HIV1 infection has been observed in multiple cohort studies. One of the best characterized HIV1 exposed yet uninfected groups is a commercial sex worker cohort from Nairobi, Kenya. (Fowke, et al, 1996; Plummer, et al, 1999; Ball, et al, 2007) A gene expression analysis conducted showed differential regulation of the glycolysis/gluconeogenesis pathway in HIV-1 exposed yet seronegative CSWs. (Songok, et al, 2012)

Glucose is utilized by lymphocytes as their primary fuel source for cell survival, size, activation and cytokine production. The first critical regulatory step in glucose metabolism is glucose entry into cells through facilitated diffusion by proteins of the glucose transporter (GLUT) family. (Fox et al, 2005; Jacobs, et al, 2008)

Over-expression of GLUT1 leads to increased glucose uptake and glycolysis which is required to mount a functional immune re- sponse necessary for rapid cell growth and proliferation in T lymphocytes. (Maclver et al, 2008)

Methods:

The study population was drawn from the Pumwani

Sex Worker Cohort, Nairobi including: HIV highly exposed yet seronegative (HESNs) CSWs (> 7 years); newly enrolled HIV- uninfected (< 7 years); HIV-infected and lowly-exposed HIV negative antenatal clinic attendees (low risk group). Total RNA was extracted from PBMCs using Trizol; cDNA was synthesized and relative mRNA expression determined using SYBR Green by quantitative real time PCR.

Results:

Each assay was normalized using 18s rRNA gene. We observed a significant difference between highly exposed yet uninfected (HESNs) and newly enrolled HIV uninfected CSWs.

($p = 0.0056$) There was no significant difference between HESNs with the HIV negative antenatal clinic attendees ($p = 0.8628$) and HIV infected CSWs ($p = 0.5399$).

Conclusion:

We observed significantly lower mRNA expression of Glut1 in HESNs when compared to their uninfected yet susceptible counterparts. Following studies of Glut 1 protein expression and uptake studies are underway to understand the role Glut1 in glucose metabolism in HIV resistance.