

# Renal Function in a Perinatally HIV-1 Infected Cohort

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## Abstract

**Background:** Renal disorders are among the top ten noninfectious complications occurring in perinatally HIV-1 infected children. In a study performed in 2009, we demonstrated for a perinatally HIV-1 infected population a 10% frequency of abnormal renal findings.

**Objective:** Determine, for the interval 2008 to 2015, the frequency of renal disorders in a cohort of perinatally HIV-1 infected individuals and test for relationships of microalbuminuria with laboratory and clinical outcomes.

**Results:** 69 patients were included who had microalbumin/creatinine ratio (MC) determined between 2008 and 2015 and for whom viral load (VL), CD4%, CD8%, CD8+CD38+%, CD8+HLA-DR+% and complete demographic data were available. 13 patients (19%) met preset definitions for microalbuminuria (>2 findings of MC >30 mg/g, separated by at least 1 month). Selected outcomes for the microalbuminuria patients were compared to those of the 56 patients who had normal MC values.

**Conclusions:** 19% of a single practice cohort of perinatally HIV-1 infected children was found to have microalbuminuria. The microalbuminuria group exhibits marked activation of CD8+ but were not discernable by the most common measures of HIV clinical status, CD4% and VL. In spite of the current patient population being in better clinical status with respect to HIV disease (higher CD4 % and lower VL) than our past population we found an ~10% increase in frequency of abnormal renal findings as compared to ~10 years ago.

## Background

- Individuals with perinatal HIV infection are at risk for different types of renal disease, most importantly HIV-associated nephropathy (HIVAN) for which proteinuria is a reliable clinical marker.
- Pathogenesis of HIVAN is not fully understood but viral, host and genetic factors are involved.
- Longer life span of perinatal HIV patients has led to an increase in renal diseases as a co-morbidity.
- MC, a good reflection of 24 hours urinary protein excretion, can detect early stages of glomerular disease.

## Objective

- Determine the frequency of renal disorders in a cohort of perinatally HIV-1 infected individuals and test for relationships of proteinuria with laboratory and clinical outcomes.

## Methods

- The study is a retrospective review of 69 HIV infected patients, receiving care in an urban pediatric HIV clinic.

- Clinical and laboratory data, obtained from patient records at routinely scheduled clinic visits between 2008 and 2015. Patients were divided into 2 groups based on the results of MC ratio: Microalbuminuria group (Micro) including patients with at least 2 abnormal MC ratio (>30mg/g) more than one month apart and a non-microalbuminuria group (Non-micro).

## Results

Table 1. Demographics and Laboratory Findings

	Non-micro	Micro	P value
n (%)	56 (81)	13 (19)	
Age, median (IQR)	11.7 (6.8)	12.3 (9.62)	NS
Gender (% female)	50	84	<0.01
Black	71	69	NS
Hispanic	19	30	NS
MC, mg/g, median	5	51	<0.01
VL copies per ml, median (range)	180 (20-485,460)	110 (20-165,140)	NS
CD4%, median	32	32	NS
CD8%, median	41	43	NS
CD8CD38%, median	12	22	<0.01
CD8DR%, median	7	15	<0.01

NS: Not significant

- 69 patients had 2 or more MC reported between 2009 and 2015 and had complete demographic and laboratory data (HIV-1 viral load and lymphocyte subsets).
- 13 patients (19%) met the definition of microalbuminuria.
- Apart from the presence of more females in the Micro group, demographic outcomes did not differ between the 2 groups.
- CD4 and viral load were not significantly different between the 2 groups however CD8CD38 and CD8DR were higher in the microalbuminuria patients.

## Conclusions

- About 19% of a cohort of perinatally HIV-1 infected children was found to have persistent proteinuria, suggestive of glomerular disease.
- CD4% and viral load were not significantly different between the with or the without microalbuminuria groups suggesting an important role of other factors contributing to development of proteinuria.
- CD8CD38 and CD8DR, markers of immune activation, were significantly elevated in the microalbuminuria group. This correlates well with results found in adults.