

# HIV NEPHROPATHY IN CHILDREN DETECTED BY QUANTITATIVE PROTEINURIA

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## Abstract

The prevalence of HIVN in the pre-HAART era has been reported as 10-15% with a median age of onset of 30 months. The objective of the study was to determine the prevalence of HIVN using random urine protein/creatinine ratio (U P/Cr) among HIV infected children in the HAART era.

**Methods:** retrospective, chart review of patients, from 1/98 to 1/03, of a single urban, tertiary care, clinic population of HIV infected children in Miami in whom at least two measurements of U P/Cr were done. A scoring system based on degree of proteinuria, renal function, radiological studies and histologic changes was developed (See table in Design/Methods section)

**Results:** Of 315 patients (pts) being followed during the interval, 286 were included. Of these 142 (49.7%) were male, 242 (86.5%) were Black or African-American (AA), 283 (99%) were perinatally infected, 92 (32.2%) were CDC Immunologic Category (IC)C3 and 244 (85.3%) were on HAART. A total of 98 (34.3%)pts had HIVN, 59(20.6%) based on the presence of persistent proteinuria\*(PP) alone, while 39 (13.6%) had overt HIVN\*\* Of the 39 pts with overt HIVN, the mean age at diagnosis was 8.7 years, 26(66.6%) were male, 36(92.3%) were Black or AA, and 35 (87.7%) had C3 disease. HIVN was more prevalent in pts with C3 disease independently of other factors. **Outcome:** 12 (31%) pts progressed to chronic renal insufficiency and 3 required dialysis. Mortality was 15.4 %. Mortality adjusted for C3 IC was higher for pts with HIVN than for pts without HIVN (21.4 vs. 7.4%, Z test 1.84, p=0.07, CI 95%). Severity of HIVN correlated significantly with high Viral load\*\*\* (VL)(r=0.74; p<0.0001). No correlation with the assigned IC as determined by the standard CDC criteria was found, however there was significant correlation between severity of HIVN and Reassigned IC \*\*\*(RIC) (r=0.624; p<0.001). Two pts developed overt HIVN despite good VL control but both were severely immuno-suppressed.

## Introduction

HIVN typically presents with persistent proteinuria, histopathologic changes and renal echographic/scintigraphic abnormalities. The prevalence of HIVN in the pre-HAART era has been reported as 10-15% based upon proteinuria detected by urine dipstick with or without associated radiologic or histological findings. The objective of the study was to determine the prevalence of HIVN using a more sensitive and quantitative tool with random urine protein/creatinine ratio (U P/Cr) among perinatally HIV infected children on HAART.

## Design/Methods

Retrospective, chart review of patients (pts), from 1/98 to 1/03, of a single urban, tertiary care, clinic population of HIV infected children in Miami.

## Definitions

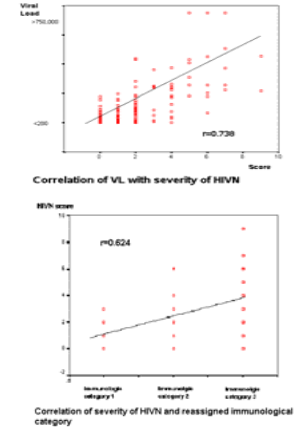
**\*Persistent Proteinuria (PP):** U P/Cr >0.2 in 2 occasions at least 2 weeks apart in the absence of acute illness.

**\*\*Overt HIVN:** PP associated with renal ultrasound and/or scintigraphic changes. Severity of HIVN was assessed by the scoring system (1 - 9) described below.

**\*\*\*Viral load (VL)** was calculated as the mean of the VL values obtained around the time U P/Cr was determined.

**\*\*\*\*Reassigned Immunologic Category(RIC):** based on the criteria established by the CDC, an IC was re-assigned to each patient, using the mean values of the CD4 cell counts obtained around the time U P/Cr was determined ( values coincident with VL values mentioned above.

**HIVN Score**  
**Proteinuria (based on values of U P/Cr)**  
0 = absent: < 0.14  
1 = intermittent/minimal: ≥ 0.14 to < 0.2  
2 = persistent: ≥ 0.2 to < 2 (at least two values)  
3 = nephrotic: >2.0  
**Renal Histopathologic changes**  
0 = normal kidney biopsy  
1 = glomerular involvement in kidney biopsy  
**Renal function**  
(based on serum Cr /Schwartz formula)  
0 = no renal insufficiency (RI)  
1 = renal insufficiency  
2 = renal insufficiency requiring dialysis  
**Renal Ultrasonography (U/S)**  
0 = normal  
1 = nephromegaly / hydronephrosis  
2 = increased echogenicity  
**Renal Scintigraphy (Mag 3 scan)**  
0 = normal  
1 = mild cortical retention/dysfunction  
2 = severe cortical retention/dysfunction



## Results

	Total Pt N=286	PP only N=59	Overt HIVN N=39
male	142 (49.7%)	26 (44.1%)	26 (66.6%)
mean age	11.4 (1-23)	8.7 (0.2-18.2)	8.7 (0.4-17.6)
HIV cat. C3	92 (32.2%)	29 (49.2%)	35 (87.7%)
black	242 (84.6%)	53 (89.8%)	38 (92.3%)
white	44 (15.4%)	6 (10.2%)	3 (7.6%)
* Z test = 6.9 ( P < 0.001, CI 95% )			

	PP only N=59	Overt HIVN N=39
Renal insufficiency	0 (0 %)	12 (30.8 %)
Nephrotic Syndrome	1 (1.2 %)	8 (20.5 %)
Dialysis	0 (0 %)	3 (7.7 %)
Mortality	4 (6.7 %)	6 (15.4 %)

Mortality adjusted for HIV CDC category C3	
Total category C3 Pts N=54	4 (7.4 %)
Category C3 pts with Overt HIVN N=28	6 (21.4 %)
* Z test = 1.84 ( P = 0.07, CI 95% )	

## Conclusions

1. Screening for quantitative proteinuria in urine is essential for the early diagnosis of HIVN.
2. HIVN is more prevalent in patients with C3 disease independently of other factors.
3. Severity of HIVN correlates significantly with persistent high VL.
4. Severity of HIVN correlates significantly with reassigned immunologic category.
5. In this retrospective analysis involving primarily perinatally infected children on HAART, there was not an appreciable reduction in the frequency of HIVN ( 10-15% versus 13.6% ) as defined by U Pr/Cr screening, although the mean age of onset of overt HIVN occurred later (8.7 years versus 2.5 years)