

Trends in epidemiology of ESRD incidence among pediatric patients, 1980-2007

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Introduction

- Incidence rates of end-stage renal disease (ESRD) have steadily increased in adults since 1980, and disproportionately affect racial minorities.
- However, few studies have assessed the trends within the pediatric population.
- The purpose of this study was to characterize trends in the incidence of ESRD in a national cohort of pediatric patients in different racial and ethnic groups.

Methods

- Retrospective analysis of US incident ESRD patients aged 0-19.
- The data were obtained from the United States Renal Data System (USRDS) database, enrollment file and CMS 2728 Medical Evidence form.
- Incident rates per million population were calculated for pediatric patients by age, race and gender for the years 1980 to 2007.
- Primary cause of ESRD is determined from diagnosis codes on the CMS 2728 Medical Evidence form.

Results

- There were a total of 29,287 incident cases during the study period.
- Incidence rates increased from 10.2 per million in 1980 to 15.1 per million in 2007—a 49% increase for all pediatric patients during the study period, 73% for patients aged 0-14, and 40% for those aged 15-19.
- Rates were higher in males versus females (Fig 1) and higher in racial and ethnic minorities compared to white patients (Fig 2, 3).
- Incidence rates have increased disproportionately since 1997 in Asians (139% age 0-14 yrs; 45% age 15-19 yrs) and in Hispanics aged 15-19 years (63%; Table 1).
- There does not appear to be an increase in the incidence of ESRD due to type II diabetes (Table 2).
- The incidence of ESRD due to FSGN has almost doubled over the last 20 years.

Table 1
Incidence rates by age, gender and race

	1980	1987	1992	1997	2002	2007
Age 0-14						
Male	6.41	10.59	9.94	9.58	12.12	11.88
Female	5.70	7.11	8.02	8.57	9.77	9.01
White	6.42	8.46	8.88	8.59	10.20	9.23
Black	5.22	10.91	10.52	14.10	15.30	11.60
Asian	-	-	10.01	6.65	8.64	23.94
Hispanic	-	-	-	11.24	12.81	13.81
Non-Hispanic	-	-	-	9.27	10.55	9.56
All	6.06	8.89	9.00	9.58	10.97	10.48
Age 15-19						
Male	21.17	25.32	30.48	28.08	29.02	32.53
Female	19.08	23.85	30.40	24.83	24.58	23.79
White	18.58	20.90	22.90	19.01	22.29	23.16
Black	28.59	44.84	65.65	61.46	49.88	45.97
Asian	-	28.14	47.30	32.46	30.50	47.07
Hispanic	-	-	-	31.00	37.27	50.45
Non-Hispanic	-	-	-	25.70	24.93	23.58
All	20.14	23.87	30.44	26.5	26.86	28.27
All Ages, 0-19						
All	10.17	13.05	14.04	13.76	14.97	15.12

Figure 1
Incidence rates by age

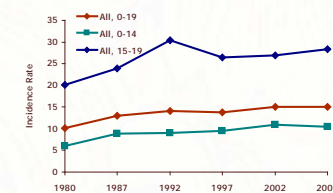


Figure 3
Incidence Rates by Race and Ethnicity, ages 15-19

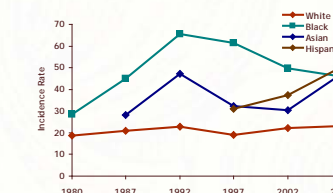
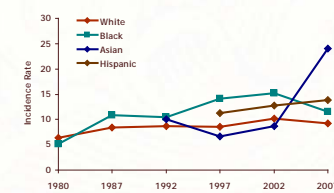


Table 2
Incidence Rates by age and primary cause of renal failure

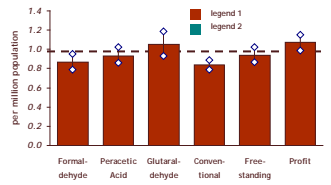
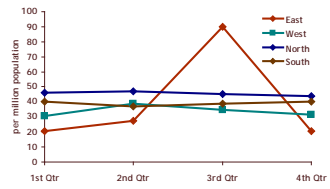
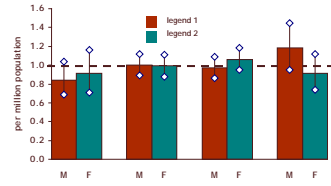
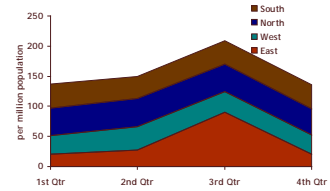
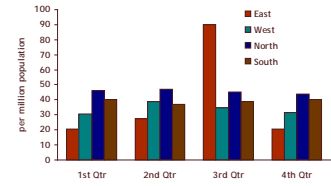
	1980	1987	1992	1997	2002	2007
Age 0-14						
Glomeruloneph.	1.93	2.72	2.60	2.27	2.54	1.86
FSGN**	0.23	0.62	0.77	1.02	1.34	1.00
Cystic Kidney Dis	0.33	0.60	0.55	0.56	0.48	0.64
Diabetes	-	-	-	-	-	-
Hypertension	-	0.37	0.25	0.24	-	0.18
Other Urologic	0.47	0.77	0.85	1.07	1.25	0.38
Other Cause	2.07	3.74	3.91	4.72	5.23	6.39
Age 15-19						
Glomeruloneph.	7.16	11.02	12.99	12.06	8.45	8.52
FSGN**	-	2.30	2.67	3.71	3.49	3.96
Cystic Kidney Dis	0.71	0.59	0.63	0.57	0.64	0.56
Diabetes	0.52	0.64	0.81	0.57	-	0.61
Hypertension	1.33	1.18	3.42	2.27	1.72	1.68
Other Urologic	1.14	1.93	1.60	1.70	2.80	1.63
Other Cause	5.40	7.75	8.70	7.99	9.72	11.27

Figure 2
Incidence Rates by Race and Ethnicity, ages 0-14



Conclusions

- Since 1997, significant increases in ESRD incidence rates have occurred in Asians aged 0-14 and in Hispanics aged 15-19.
- Rates for those with diabetes as a primary cause of pediatric ESRD are low and have remained relatively constant over time.
- Rates for those with focal segmental glomerulosclerosis as a cause of pediatric ESRD have increased markedly since the 1980s.
- Age, racial, and ethnic disparities exist in U.S. pediatric ESRD incidence rates.



10 point

graphs with confidence intervals: the bars have to be colored by hand, and the x-axis labels (if long), line at 1.0, and legend have to be made outside of the graph

TABLES: Please do not use the space bar to align numbers in columns; the numbers will not print properly. If you aren't sure how to set the tabs to create columns, just ask Ed or Sue; we'll be happy to show you.

Group #	1	2	3	4	5	6
Race	white	white	white	white	white	white
Gender	male	male	male	male	male	male
Age	45-64	45-64	45-64	45-64	45-64	45-64
ESRD years	0	0	0	0	0	0
Diabetes	no	yes	yes	yes	yes	yes
Comorbidity	no	no	PVD	PVD	PVD	PVD
Hosp. days	0	0	0	11-20	11-20	11-20
Blood trans.	0	0	0	0	3+	3+
Vascular acc.	0	0	0	0	0	2
