

Trends in mean hemoglobin levels & erythropoietin use at dialysis initiation in pediatric chronic dialysis patients

Blanche Chavers, MD, Eric Frazier, BS, David Gilbertson, PhD, Allan Collins, MD, FACP

United States Renal Data System, Minneapolis Medical Research Foundation, University of Minnesota Twin Cities

Introduction

- The Kidney Dialysis Outcomes and Quality Initiative (K/DOQI) guidelines previously recommended a target Hgb of 11 to 12 g/dl in pediatric (age <20) and adult (age 20+) patients with Stage 5 chronic kidney disease (CKD) glomerular filtration rate (GFR) <15 ml/min.
- New K/DOQI practice guidelines for anemia were published in May 2006 (AJKD vol. 47, Suppl 3, 2006) and now define anemia as a Hgb level of <13.5 g/dl in adult males, <12.0 g/dl in adult females, and less than the 5th percentile of normal when adjusted for age and gender in pediatric patients.
- Recombinant human erythropoietin (EPO) became available for use in the treatment of anemia due to CKD in 1989.
- Previously, we reported that mean Hgb levels and EPO use at the initiation of dialysis years 1996 to 2000 were lower in pediatric dialysis patients compared to adult dialysis patients (Chavers et al, Kidney Int 65:266-273, 2004).
- We continue to study mean Hgb levels and EPO usage in US Medicare incident pediatric and adult dialysis patients to determine ongoing trends.

Methods

- We used data from the United States Renal Data System to study mean Hgb levels and EPO use in Medicare patients who started dialysis during 1995 to 2004 and who reached day 91 of Stage 5 CKD between January 1 and December 31 of the study year.
- Anemia was defined as a Hgb level of <11.0 g/dl; Hgb values were calculated by dividing the hematocrit by three.
- Demographic data, including age, gender, race, and primary cause of Stage 5 CKD were obtained from the Identification and Medical Evidence sections filed between May 1995 and June 2006 of the Renal Beneficiary Utilization System of the Centers for Medicare and Medicaid Services.
- Data on Hgb levels and EPO use were obtained from institutional outpatient Medicare claims.
- Trends in mean Hgb values and EPO use were identified by age and year and we used a T-test to compare pediatric patients with adult patients.

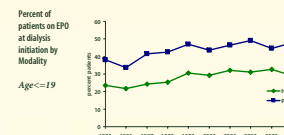
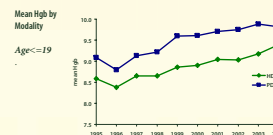
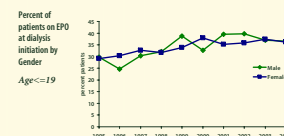
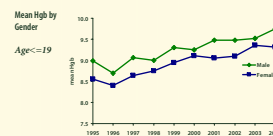
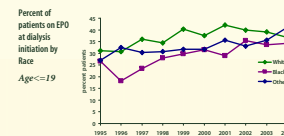
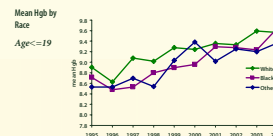
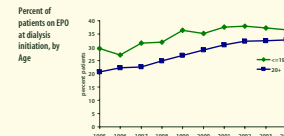
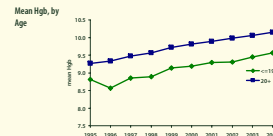
Results

- From 1995 to 2004, mean hemoglobin levels have generally increased from 8.8 to 9.6 g/dl and 9.3 to 10.2 g/dl, respectively, in pediatric and adult patients initiating chronic dialysis (P values for trend <.00001).
- The percentage of patients on EPO at dialysis initiation increased from 29.5% and 20.6% in 1995 to 20.6% and 32.8% in 2004 for pediatric and adult patients, respectively.

Distribution of 2004 incident dialysis patients by age, gender, race, primary diagnosis, and dialysis modality.

	Age 19		Age 20+	
	N	(%)	N	(%)
Male	498	56.76	54,366	55.1
Female	486	43.24	44,287	44.9
White	676	60.14	63,002	63.88
Black	324	28.83	27,565	27.95
Other	124	11.03	8,066	8.18
Diabetes	24	2.14	45,142	45.77
Hypertension	77	6.85	27,659	28.04
GN	333	29.63	3,368	3.41
Cystic Kidney	32	2.85	1,948	1.97
Other Urologic	36	3.2	1,345	1.36
Other Cause	503	44.75	11,487	11.65
Unknown/mis	119	10.59	3,744	3.8
HD	672	59.79	92,146	93.42
PD	452	40.21	6,486	6.58
Unknown/mis	.	.	0	0
All	1124	100	98,633	100

	Age 19		Age 20+	
	N	(%)	N	(%)
Male	618	66.76	54,366	55.1
Female	486	43.24	44,287	44.9
White	676	60.14	63,002	63.88
Black	324	28.83	27,565	27.95
Other	124	11.03	8,066	8.18
Diabetes	24	2.14	45,142	45.77
GN	331	29.65	3,368	3.41
Lupus erythematosus, (SLE nephritis)	84	7.47	1,012	1.03
Chronic pyelonephritis, reflux nephropathy	2	0.18	217	0.22
Chronic interstitial nephritis	0	0	166	0.17
Hypertensive/Large Vessel Disease	2	0.18	217	0.22
Cystic/Hereditary/Congenital Diseases	77	6.85	27,659	28.04
Alports, other hereditary/familial disease	218	19.4	2,719	2.75
Renal hypoplasia, dysplasia	1	0.09	30	0.03
Other	68	6.05	93	0.09
Other	319	28.38	14,915	15.12
HD	672	59.79	92,146	93.42
PD	452	40.21	6,486	6.58
Unknown/mis	.	0	1	0
All	1124	100	98,633	100



Conclusions

- Improvement in Hgb levels and use of EPO has occurred in US Medicare patients who started chronic dialysis therapy between 1995 and 2004.
- Hgb levels in children continue to lag behind those in adult patients and warrant further attention.