

Erythropoiesis-Stimulating Agent (ESA) Use Among Medicare Patients Receiving Hemodialysis and Observations About Pruritus

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Introduction

- Data by Nunley et al. show > 90% of dialysis patients report pruritus, ranging from mild to severe.¹
- The Dialysis Outcomes and Practice Patterns Study (DOPPS) reported 70% of hemodialysis (HD) subjects with end-stage renal disease (ESRD) suffered from pruritus; 42%-45% had moderate-to-extreme itchiness.²
- The Kidney Disease Quality of Life 36 (KDQOL) assesses dialysis-specific, patient-reported health-related QOL for individuals with ESRD who are undergoing dialysis.³ It includes SF-12 physical and mental component scores (PCS and MCS, respectively), subscales for burden of disease, symptoms and problems (including skin itch), and effects on daily life. This survey is administered yearly to dialysis patients treated by a large dialysis organization.

Objective

We hypothesized that ESA use, as an important health outcomes measure, would generally be reduced across the 6-month period following the KDQOL survey, consistent with label changes and prescribing patterns, but ESA use would be higher with increased patient-reported skin itchiness and dryness.

Methods

- We examined health records for patients (N = 38,315) undergoing dialysis who had also completed the KDQOL survey.
- Patients were ≥18 years old receiving in-center HD thrice weekly between Dec 2008 and Jun 2012.
- Patients were included if they had a KDQOL assessment ≥3 months after starting dialysis and had Medicare as their primary payer.
- Generalized linear mixed models were fit to determine differences in ESA use across categories of itchy or dry skin severity during the first 6 months following the KDQOL survey.
- Models were adjusted for age, BMI, vintage, gender, race, cause of ESRD, vascular access, comorbid conditions, history of transplant, and time.
- ESA costs were determined by calculating the ESA dose and multiplying by unit prices published in Red Book.

Results

- Overall ESA use was reduced across the 6-month observation period (p < 0.0001).
- Patients reporting the most severe itch/dryness were associated with increased ESA utilization.

Table 1. Patient Characteristics by Itchiness Score

		Itchi	ness Score			
	1 n = 15,319	2 n = 11,567	3 n = 5,867	4 n = 3,571	5 n = 1,991	P-value
Age (years, mean SD)	62.32 ± 14.44	61.96 ± 14.25	61.55 ± 14.3	61.32 ± 14.61	59.37 ± 14.25	< 0.0001
Gender (% female)	46.3	45.47	45.36	48.19	50.88	0.0022
Race/Ethnicity (%)						
African American	41.94	41.71	39.34	41.89	45.61	< 0.0001
Asian	1.88	2.12	2.44	2.63	1.46	
Caucasian	37.57	37.82	39.82	36.26	34.2	
Hispanic	14.28	13.74	13.87	15.23	14.97	
Other	4.33	4.61	4.53	3.98	3.77	
Vintage (mean SD)	3.83 ± 3.85	4.01 ± 3.89	3.98 ± 3.89	3.9 ± 3.56	4.07 ± 3.88	0.004
DaVita Vintage (mean SE	D) 3.08 ± 3.06	3.2 ± 3.03	3.19 ± 3.05	3.17 ± 2.94	3.19 ± 3.03	0.0155
Comorbidities (%)						
Cardiovascular	28.53	29.45	31.36	31.5	32.7	< 0.0001
Cancer	2.21	2.43	2.49	2.8	2.71	0.0215
COPD	3.39	4.05	4.57	5.26	6.48	< 0.0001
Liver disease	1.81	2.03	2.03	2.38	2.66	0.0029
Pruritus	3.46	4.88	5.37	7.17	10.1	< 0.0001
Bacteremia	27.39	29.2	31.57	32.68	33.85	< 0.0001
Septicemia	5.88	6.57	7.12	7.2	7.89	< 0.0001
Dry Skin Category (How	Bothered) (%)					
Not	58.05	19.24	11.2	7.5	5.63	< 0.0001
Somewhat	25.69	58.51	16.06	9.66	6.43	
Moderately	9.64	12.17	52.91	14.37	9.09	
Very	4.45	7.09	14.64	59.12	13.71	
Extremely	2.17	2.98	5.2	9.35	65.14	
Vascular Access						
Catheter	17.56	16.25	17.33	17.36	17.43	0.005
Fistula	60.95	60.74	61.72	61.72	58.92	
Graft	21.49	23.01	20.95	20.95	23.66	
Kt/V (mean SD)	1.56 ± 0.52	1.56 ± 0.5	1.57 ± 0.49	1.55 ± 0.51	1.56 ± 0.49	0.7504
Use of IV Antibiotics (%)	4.52	4.86	5.06	5.82	6.98	< 0.0001
Use of Pruritus Treatmen	its (%)					
IV	3.69	3.74	4.33	4.56	5.68	0.0003
Oral	10.74	13.24	14.88	19.04	24.71	
Topical	2.17	2.37	2.66	2.8	3.37	
Missing	83.39	80.64	78.13	73.59	66.25	

Increasing score means increased itchiness (1 = Not Bothered At All; 2 = Somewhat Bothered; 3 = Moderately Bothered; 4 = Very Much Bothered; 5 = Extremely Bothered); Abbreviations: SD, standard deviation.

- The additional ESA use for the worst itchiness and dryness scores added \$270 to \$500 to the per-patient, per-month cost of treatment.
- Hemoglobin (Hb) concentrations did not differ with increasing itchiness severity (range, 11.28–11.34 g/dL; p = 0.812) during the 6-month follow-up period.
- Serum phosphorus was slightly greater among HD patients with the worst itch/dryness scores.
- The proportion of HD patients requiring IV antibiotics during the 6-month follow-up period increased across itchiness severity scores (range, 14.09%–20.74%).
- Kt/V did not differ with increasing itch (range, 1.55–1.57, p = 0.7504) during 6-month follow-up.

Figure 1. Adjusted Monthly ESA Utilization Differences by Itchiness or Itchiness + Dryness

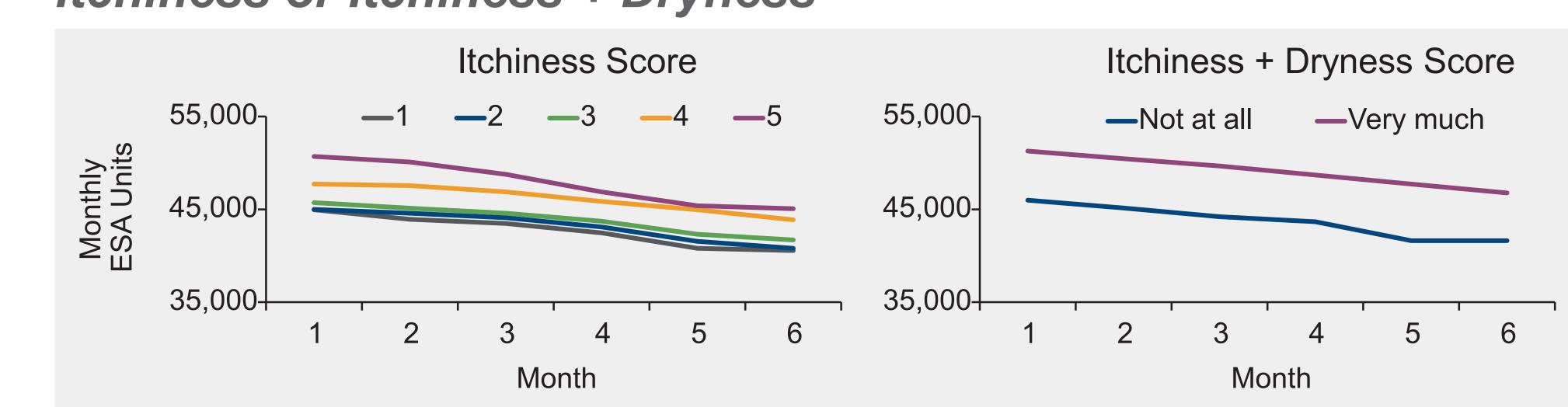


Figure 2. ESA & IV Antibiotic Utilization by Itchiness Score

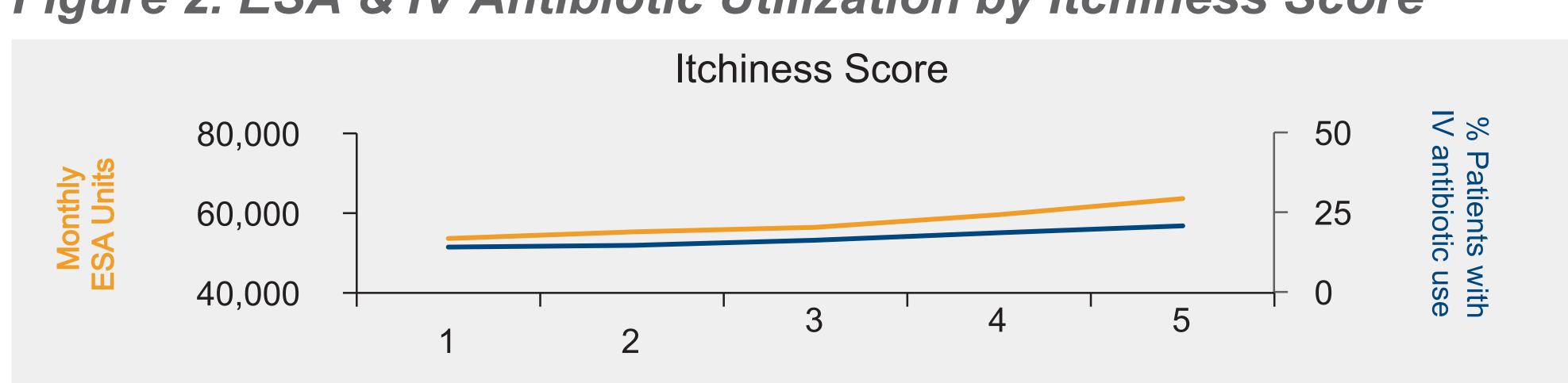


Table 2. Clinical Laboratory Values by Itchiness Score

Itchiness Score								
	1	2	3	4	5	P-value		
	n = 15,319	n = 11,567	n = 5,867	n = 3,571	n = 1,991			
Serum phosphorus (mg/dL) 4.92 ± 1.48	5.08 ± 1.57	5.11 ± 1.57	5.16 ± 1.69	5.3 ± 1.7	< 0.0001		
Corrected calcium (mg/dL)	8.71 ± 1.81	8.75 ± 1.8	8.81 ± 1.64	8.76 ± 1 .77	8.88 ± 1.59	< 0.0001		
Serum PTH (pg/mL)	350.45 ± 368.28	362.35 ± 372.45	358.45 ± 356.37	375.08 ± 376.29	368.92 ± 367.93	0.0003		
TSAT (%)	26.63 ± 16.88	26.92 ± 16.81	26.75 ± 16.79	26.6 ± 16.6	26.9 ± 16.92	0.65		
Serum ferritin(ng/mL)	516.88 ± 432.04	519.69 ± 422.30	519.62 ± 426	524.58 ± 447.44	495.94 ± 412.25	0.562		
Hemoglobin (g/dL)	11.3 ± 1.21	11.34 ± 1.21	11.33 ± 1.23	11.29 ± 1.28	11.28 ± 1.29	0.8122		
Albumin (g/dL)	3.83 ± 0.75	3.83 ± 0.75	3.84 ± 0.73	3.78 ± 0.79	3.77 ± 0.73	3.84 ± 0.73		

Conclusions

- Self-reported skin itch is highly correlated with validated KDQOL component and subscale scores.
- Skin itch is an independent predictor of clinical and quality-of-life issues for HD patients, suggesting that skin itchiness is an important condition to address in this patient population.
- With increased itchiness, ESA use increased and mean Hb concentration remained consistent while IV antibiotic use increased. Further investigation is needed to understand this constellation of results.

References

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