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Title: Relationship among Vascular Access Insertions, Infections, and Anemia Management among Hemodialysis Patients.

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Abstract:

Arteriovenous (AV) fistulae are the recommended type of permanent vascular access (VA) for chronic hemodialysis (HD). However, in the U.S. most patients begin chronic HD with a catheter, and polytetrafluoroethylene grafts are more common than AV fistulas. Recent data suggest that VA type contributes to erythropoietin (EPO) resistance. We examined catheter insertions, VA infections and anemia management in chronic HD patients. Hemoglobin (Hb) levels, EPO and intravenous (IV) iron doses were compared with concurrent VA insertions and infections in 186,348 prevalent Medicare EPO-treated HD patients in 2000. We also studied anemia management following VA insertions and infections in 67,410 incident Medicare EPO-treated HD patients from 1997 to 1999. Follow-up Hb and EPO per week were analyzed by numbers of temporary or permanent catheter insertions and hospitalizations for VA infection. Multiple linear regression models for incident patients controlled for demographics, baseline Hb, IV iron use, blood transfusions, hospital days and comorbidities.

	Mean values for prevalent EPO-treated HD patients in 2000					
	Temporary catheter insertions		Permanent catheter insertions		Hospitalizations for VA infection	
	0 (N=154,755)	2+ (N=10,409)	0 (N=160,046)	2+ (N=7,013)	0 (N=173,365)	2+ (N=2,415)
Hb (g/dL)	11.5	11.2	11.5	11.2	11.5	11.1
EPO per week (units)	14,793	19,841	14,847	20,578	15,018	21,807
IV iron per month (vials)	1.62	1.79	1.62	1.89	1.63	1.87

In the prevalent cohort, increasing temporary and permanent catheter insertions and VA infections were associated with slightly lower Hb, higher EPO doses, and higher IV iron. In the incident cohort, compared to 0 VA infections or 0 temporary or permanent catheter insertions, respectively, patients with 2+ VA infections or 2+ catheter insertions had 0.12 g/dL and 0.06 g/dL lower mean Hb ($p=0.0028$ and $p<0.0001$) and 25.7% and 12.2% higher mean EPO per week ($p<0.0001$). We conclude that higher EPO doses are required to maintain the same or slightly lower mean Hb levels

among chronic HD patients with increased numbers of catheter insertions and VA infections compared to those without any.