



Hypertension and Anemia Related to Renal Insufficiency

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Case Presentation

In the May/June issue of *Assisted Living Consult* (page 9, <http://www.assistedlivingconsult.com/issues/04-03/alc56-CaseStudy-521.pdf>), we described DH, an 82-year old African-American woman, who was admitted to an assisted living (AL) facility. Her admitting diagnoses were schizophrenia, Alzheimer's disease (AD) with some behavioral disturbances, hypertension, and anemia related to chronic renal insufficiency. DH was recovering from a left hip fracture, but ambulating quite well. She required minimal assistance with her activities of daily living (ADLs). Although DH was having memory problems, her vision and hearing were good for her age. She had occasional incontinence.

DH is 5'1", weighs 130 lbs, has no known drug allergies, and her family relatives are unknown. A nursing note several days after her April admission stated that DH was reluctant to take her medications and that her mental function varied throughout the day. Her medications and lab test results are listed in Tables 1 and 2.

In this issue of *ALC*, we continue to discuss DH's problems, specifically her hypertension and anemia related to renal insufficiency.

Hypertension

The 7th report of the Joint National Committee on Prevention, Detection, and Treatment of High Blood Pressure (JNC-7) recommends that thiazide-type diuretics be tried initially in most patients.¹ In patients with coexisting conditions, JNC-7 recommends specific agents based on the condition.¹ Patients with diabetes or renal disease may benefit from a goal blood pressure of less than 125/75 mm Hg. Many patients need 2 agents to achieve goal blood pressure. With effective antihypertensive therapy, the renal prognosis in hypertension improves. Angiotensin-converting enzyme (ACE) inhibitors and angiotensin-receptor blockers (ARBs) offer organ protection for the kidneys in patients with hypertension and are the preferred agents if there are no contraindications.¹ A diuretic with an ACE inhibitor or ARB is recommended for patients with renal insufficiency or diabetes who need 2 medications to control hypertension.¹

Comments and Suggestions

The pharmacist determined that DH has an estimated creatinine clearance of 19 mL/minute. She is currently

taking amlodipine. DH's chart documented only 1 blood pressure reading in April (when she was admitted) of 140/80 mm Hg, and 1 reading in May of 145/90 mm Hg. Blood pressure readings need to be taken every week. Consideration might be given to changing DH to an ACE inhibitor such as enalapril 2.5 mg/day, which is the recommended dose for a renally impaired patient with a creatinine clearance of 30 mL/minute or less. But first, regular blood pressure readings are needed to provide a clearer picture of her blood pressure.²

Table 1.
DH's Medications

Donepezil, 5 mg PO daily
Ferrous sulfate, 325 mg PO daily
Ziprasidone, 80 mg PO every morning and 40 mg PO every evening (discontinued April 27)
Multiple vitamin with minerals, PO every day
Amlodipine, 10 mg PO daily
Lorazepam, 1 mg PO (1-2 tablets every 4 hours prn for increased agitation)

Table 2.
Laboratory Findings

Test	Result	Reference value
Sodium	126	135-147 mEq/L
Potassium	4.8	3.5-5.0 mEq/L
Chloride	105	95-110 mEq/L
BUN	30	8-25 mg/dL
Serum Creatinine	1.7	0.5-1.7 mg/dL
Glucose	120	65-115 mg/dL
Calcium	9.0	8.6-10.3 mg/dL
Hemoglobin	8.5	12-15 g/dL
Hematocrit	27	33%-43%

Anemia with Chronic Renal Insufficiency

Patients with renal insufficiency often develop anemia due to decreased production of erythropoietin.^{3,4} Renal insufficiency risk factors include diabetes, hypertension, proteinuria, hyperlipidemia, obesity, and smoking. People of races other than Caucasian are at higher risk also. DH has 2 known risk factors. With an estimated creatinine clearance of 19 mL/minute, DH has chronic renal insufficiency (CRI). Patients with reduced kidney function often develop a normocytic, normochromic anemia.^{5,6} The decreased kidney production of erythropoietin with CRI results in low hemoglobin levels.^{3,5} Low hemoglobin levels have been associated with left ventricular hypertrophy, reduced exercise tolerance, and reduced quality of life in geriatric patients.^{3,7} Anemia associated with CRI progresses as renal function worsens.⁵ Other factors that can contribute to or cause the anemia of CRI include iron, folic acid, or vitamin B₁₂ deficiency; shortened red blood cell survival; blood loss; severe infection; and aluminum toxicity.^{5,7}

Therapy may include erythropoietin for long-term correction and maintenance of hemoglobin and hematocrit levels, especially in community-dwelling patients and those on dialysis.^{5,6} The National Kidney Foundation (NKF-K/DOQI) Clinical Practice Guidelines recommend an evaluation of anemia in patients with renal insufficiency when the hemoglobin is less than 12 g/dL among adult men and postmenopausal women.⁶ Extensive evaluations may not be as appropriate in patients with advanced AD.⁸ However, underlying disorders such as vitamin B₁₂, folic acid, or iron deficiency and blood loss can be evaluated and corrected. The NKF recommends erythropoietin alfa treatment along with supplemental iron for patients with CRI, whether on dialysis or not, to achieve an appropriate hemoglobin level.⁶ Darbopoetin and epoetin alfa are commercial products available to treat anemia in kidney disease.^{4,6} These products are not routinely used in AD patients in the AL or long-term care settings. Side effects of these agents include increased blood pressure and edema.^{5,8}

Renal insufficiency and anemia are not uncommon in the AL setting.

Comments and Suggestions

DH's hemoglobin was low at 8.5 g/dL in April. A stool guaiac test would detect possible gastrointestinal blood loss. B₁₂, serum folate, and iron levels should also be checked.

Other Considerations and Conclusion

DH has had a hip fracture. She does not have a record of a bone mineral density test, but these tests are done less often in patients living in AL facilities, especially once there is a diagnosis of AD. DH is not receiving a calcium supplement, and there is minimal calcium supplementation in her multivitamin. It would be appropriate to determine the amount of daily calcium she is consuming and recommend oral calcium supplementation to achieve a daily intake of 1500 mg through diet and supplements.

DH's problems and therapy are not uncommon in the AL setting. Simple steps can be taken to optimize her therapy.

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