

FROM THE FAMILY PRACTICE INQUIRIES NETWORK

How soon should serum potassium levels be monitored for patients started on diuretics?

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■ EVIDENCE-BASED ANSWER

Case series show that hypokalemia following initiation of diuretic therapy occurs in most patients within 2 to 8 weeks. However, no studies are available that adequately predict the risk of this complex and multifactorial condition. Patients taking diuretics should have a potassium level checked in the first 2 to 8 weeks after initiating therapy. Mild hypokalemia (3.1 to 3.4 mmol/L) may be transient, so a repeat measurement may be considered before initiating potassium replacement. Dietary sodium restriction may also help to conserve potassium, because this will decrease urinary flow rate and potassium loss. The frequency with which to check potassium levels should be guided by the patients' underlying clinical conditions and dietary potassium and sodium intake. (Grade of Recommendation: C, based on case series)

■ RECOMMENDATIONS FROM OTHERS

The National Council on Potassium in Clinical Practice issued a set of guidelines for potassium replacement in September 2000.¹ The authors recommend using thiazide diuretics at a low dose only (eg, 12.5-25 mg of hydrochlorothiazide daily) and adding a potassium-sparing diuretic drug when higher diuretic doses are needed. For patients with asymptomatic hypertension they recommend trying to maintain a serum potassium level of at least 4.0 mmol/L. The University of Iowa Family Practice Handbook² states: "Maximal decrease in serum K⁺ concentration is usually seen after 7 days of treatment. Serum K⁺ concentration should be measured before initiation of a diuretic and 1 week after initiation of increase in dose of the diuretic."

■ EVIDENCE SUMMARY

Hypokalemia is defined as a serum potassium level less than 3.5 mmol/L (3.5 mEq/L); hypokalemia at levels between 3.1 and 3.4 mmol/L is considered mild. The incidence of hypokalemia reported for patients on diuretic therapy is broad (7.2% to 56%),³⁻⁶ and the time period required to develop hypokalemia varies (1 week⁶ to >1 year⁷). Factors including the type of diuretic used, dosage, duration of use, dietary potassium, and so forth, make predicting an individual patient's progression nearly impossible. Widmer and coworkers⁵ found that the risk of hypokalemia was greatest with concomitant glucocorticoid use, polypharmacy (greater than 12 medications administered), and female sex. The latter risk factor may be related to a higher dose-to-weight relationship.

Lemieux and colleagues⁸ followed 50 patients receiving a variety of diuretic regimens (hydrochlorothiazide 50 to 100 mg daily or every other day with or without reserpine 0.25 mg daily). Only 3 patients in this group had potassium levels below 3.5 mmol/L, and all decreases were only transient. Peters and coworkers⁶ documented potassium levels below 3.5 mEq/L in 6 of 19 patients taking hydrochlorothiazide 25 or 50 mg for 20 weeks. Three of these patients normalized without therapy. One of these transiently hypokalemic patients was also taking triamterene, a potassium-sparing diuretic.

Potassium-sparing diuretics may not free the clinician from checking a potassium level, however. Penhall and coworkers⁹ found hypokalemia in 24 of 54 patients receiving a fixed-combination diuretic (hydrochlorothiazide 50 mg and potassium-sparing amiloride 5 mg). Note that the dose of hydrochlorothiazide was higher in this study than is generally used today. Most recent studies have found that hydrochlorothiazide in doses above 12.5 to 25 mg do not result in significantly lower blood pressure and only lead to more electrolyte abnormalities.¹⁰

Morgan and Davidson¹¹ performed an analysis of the published data available in 1980. They found that the average fall in potassium is less for patients taking furosemide (0.3mmol/L) than on thiazide diuretics (0.6mmol/L) and that this fall was only slightly influenced by dose or duration of treatment.

Clinical Commentary

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Few hypertensive patients started on low-dose diuretics will become hypokalemic, and most of those who do will have serum levels greater than or equal to 3.0 mEq/L. In patients with heart failure or renal disease, potassium should be monitored shortly after the initiation of a diuretic because of potentially more rapid electrolyte and fluid shifts. However, many of these patients will also be taking an ACE inhibitor or spironolactone: 2 drugs that may increase serum potassium levels. In the absence of heart failure or renal disease checking a potassium level a month or so following initiation, as recommended by this review, seems reasonable.

R E F E R E N C E S

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