

# Pseudohyperkalemia in chronic lymphocytic leukemia

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## 1 Pseudohyperkalemia occurs in a substantial proportion of patients with chronic lymphocytic leukemia (CLL)

Pseudohyperkalemia refers to an elevated in vitro potassium level, but without in vivo hyperkalemia.<sup>1</sup> Of 991 patients with CLL and a leukocyte count of  $50 \times 10^9/L$  or higher, 12% had at least 1 instance of pseudohyperkalemia.<sup>2</sup> In a study of 49 patients with CLL and pseudohyperkalemia, the correct diagnosis was documented for only 4 patients and treatment for hyperkalemia was given to 17 patients.<sup>1</sup>

## 2 Failure to recognize pseudohyperkalemia can result in iatrogenic harm

True hyperkalemia is treated with intravenous calcium, followed by shifting and eliminating potassium. These therapies place patients with pseudohyperkalemia at risk of adverse effects, including hypokalemia. In 1 study, severe hypokalemia (2.2–2.8 mmol/L) occurred in 35% of patients after unnecessary treatment for hyperkalemia.<sup>1</sup>

## 3 Leukocyte fragility is thought to be the cause

Leukocyte fragility occurs in CLL, as seen when dysplastic leukocytes appear smudged when prepared on a microscope slide. With vigorous sample handling, transportation via a pneumatic tube system or centrifugation, the leukocytes lyse, causing pseudohyperkalemia.<sup>3</sup>

## 4 Clinicians should suspect pseudohyperkalemia in patients with CLL and apparent hyperkalemia, who do not have corresponding risk factors or changes on electrocardiography

Additional clues for pseudohyperkalemia include a leukocyte count of  $50 \times 10^9/L$  or higher and a reported potassium level of 6.5 mmol/L or higher.<sup>1</sup> In the absence of chemotherapy, tumour lysis syndrome in CLL, which causes true hyperkalemia, is uncommon.

## 5 Ascertaining the true blood potassium level can be done in several ways

The potassium in a sample of whole blood can be measured using a blood gas analyzer.<sup>1,3</sup> Alternatively, serum and plasma potassium values can be compared. The serum potassium should exceed that of plasma by up to 0.4 mmol/L.<sup>4</sup> The easiest solution may be to hand-deliver samples to the laboratory to avoid lysis of leukocytes during pneumatic tube transportation.<sup>5</sup>

## References

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