

Pseudohyperkalemia in Chronic Lymphocytic Leukemia: An Often Overlooked Clinical Entity

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Patients with chronic lymphocytic leukemia (CLL), particularly with unstable disease, are prone to severe metabolic complications such as hyperkalemia. Pseudohyperkalemia, or spurious hyperkalemia, has serious clinical consequences such as masking clinically important hypokalemia if serum potassium concentration is normal; this can be prevented with early identification and differentiation from hyperkalemia. However, pseudohyperkalemia is not well recognized in nursing literature. This case report describes the acute development of pseudohyperkalemia in a patient with unstable CLL receiving care at a large academic cancer center.

AT A GLANCE

- Consider pseudohyperkalemia in the absence of abnormal physical examination and electrocardiogram findings consistent with hyperkalemia.
- The use of a pneumatic tube system may induce pseudohyperkalemia in patients with CLL through intracellular cell lysis, particularly in the setting of severe leukocytosis.
- Advanced practice providers' ability to accurately diagnose and manage pseudohyperkalemia and hyperkalemia promotes better cardiac-associated health in patients with CLL.

KEYWORDS

pseudohyperkalemia; chronic lymphocytic leukemia; in vitro; in vivo; cell lysis

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Chronic lymphocytic leukemia (CLL) is the most common indolent leukemia in the United States (Bnaya et al., 2021). Metabolic complications (e.g., hyperkalemia, hyperuricemia, hypocalcemia) are particularly common in patients with unstable CLL and are caused by rapid cellular destruction (Higdon et al., 2018). Empirical reports emphasize that these derangements can lead to acute urate nephropathy, sudden cardiac arrest, and death, particularly with progressive disease or in those receiving active CLL-directed therapy (Higdon et al., 2018; Koehler et al., 2020). Metabolic derangements in patients with hematologic malignancies such as CLL are considered oncologic emergencies (Higdon et al., 2018; Webster & Kaplow, 2021).

Hyperkalemia

Regarded as the most severe component of tumor lysis syndrome, hyperkalemia (serum potassium concentration greater than 5 mEq/L) can induce fatal cardiac arrhythmias, flaccid paralysis, and acute respiratory difficulty (Webster & Kaplow, 2021). Hyperkalemia is typically classified as mild (serum potassium concentration between 5.5–6.5 mEq/L), moderate (serum potassium concentration between 6.6–7.5 mEq/L), and severe (serum potassium concentration greater than 7.6 mEq/L) (Simon et al., 2022). Greater serum concentrations of potassium correlate with electrocardiogram (ECG) manifestations such as tall, peaked T waves (see Table 1), among others (Webster & Kaplow, 2021). Frequent review and careful interpretation of laboratory studies is not only recommended, but critical while caring for patients with CLL because of hyperkalemia risk. However, less described in nursing literature is when and how advanced practice providers should consider pseudohyperkalemia in patients with hematologic malignancies such as CLL.

Pseudohyperkalemia

Defined as an “artificially increased serum potassium result that does not reflect in vivo plasma potassium concentrations,” (Valentine et al., 2019, p. 1,050), pseudohyperkalemia occurs because of the in vitro release of potassium from cells into the serum; therefore, it may be triggered in the context