

Pseudo-hyperkalemia associated with extreme thrombocytosis in myeloproliferative neoplasm

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Our case describes a 73-year-old male with myeloproliferative neoplasm (MPN), prefibrotic primary myelofibrosis, who presented with pseudo-hyperkalemia due to extreme thrombocytosis. The patient was admitted to the hospital with chest pain, and a chest CT scan revealed a hematoma on his thoracic rib cage. Blood tests showed hyperkalemia with a potassium level of 6.8 mmol/L, but the patient was clinically stable and there were no elevations in serum creatinine or urea nitrogen. The patient's hemogram indicated leukocytosis (WBC of $30.36 \times 10^3/\mu\text{L}$), anemia (hemoglobin 9.3g/dL), and extreme thrombocytosis (platelet of $2476 \times 10^3/\mu\text{L}$). Surprisingly, despite the hyperkalemia, the patient's electrocardiogram did not show any signs associated with hyperkalemia such as tall T wave, widened P wave, or any other arrhythmias (Figure A). To further investigate, the potassium level was re-tested using a heparinized bottle - not the conventional SST tube - with minimal transportation time to the laboratory. The heparinized bottle result showed a potassium level of 3.30 mmol/L, in contrast to the 6.3 mmol/L from the SST tube result. Subsequently, a bone marrow biopsy confirmed myeloproliferative disease with prefibrotic primary myelofibrosis. Treatment with hydroxyurea was initiated, which led to the gradual resolution of thrombocytosis and a decrease in the potassium level (Figure B). The coincidence of decreased potassium levels and platelet count suggests that the pseudo-hyperkalemia has originated from thrombocytosis. Previous reports have demonstrated that in conditions of extreme thrombocytosis, such as MPN, a large number of platelets can release potassium into the plasma in the test bottle, leading to pseudo-hyperkalemia, which support our findings. Despite the potential fatality of hyperkalemia, clinicians should consider pseudo-hyperkalemia as a possibility when there are no definite causes for hyperkalemia. Especially in the setting of thrombocytosis due to various causes, pseudo-hyperkalemia can be easily distinguished by examining the serum potassium level in a heparinized bottle. This approach can help save medical resources, time, and prevent inappropriate treatment.

