Pseudohyperphosphatemia in Waldenstrom's Macroglobulinemia

Sir,

A 50-year-old man presented with a progressive fatigue for 3 months. The only clinical finding was severe pallor. His hemoglobin was 3 g/dl, total leukocyte count 4500/cu.mm and platelet count 10,000/cu.mm with rouleaux formation in the peripheral smear. Marrow aspirate showed almost complete infiltration by lymphoplasmacytoid cells. Serum total protein was 8 g/dl with an albumin of 3.2 g.dl. Serum electrophoresis showed a M band. Serum IgG and IgA were normal with a very high-level of serum IgM (39.7 g/l, normal <5 g/l). There was neither renal dysfunction nor lytic lesions in the bones. Based on the above findings, a diagnosis of Waldenstrom Macroglobulinemia (WM) was made.

He was started on cyclophosphamide, vincristine, and prednisolone. On day 2, his calcium, phosphate, and uric acid levels were estimated for possible tumor lysis syndrome. Surprisingly, phosphate was very high (15.5 mg/dl) with other parameters being normal. These values persisted on repeat samples. There were no other clinical signs of tumor lysis.

Literature search revealed reports of pseudohyperphosphatemia in association with paraproteinemias.[1] The phosphate levels normalized at the end of two cycles of chemotherapy without any specific intervention.

High-levels of paraproteins have been known to interfere with estimation of various laboratory parameters causing falsely high levels of bilirubin, C reactive protein, ferritin, calcium, and falsely levels of sodium, thyroxin, glucose, uric acid, and albumin.[2] Both pseudo hyper and hypo phosphatemia[2,3] have been noted in paraproteinemias.

Serum phosphate was estimated by Olympus AU 400 instrument by phosphomolybdate assay. The mechanisms of pseudohyperphosphatemia include analytical error of the proteins interfering with estimation or the presence of increased phosphate binding paraproteins.[1]

The true value can be estimated by precipitating the proteins and repeat estimation. We tried to deproteinate the sample but it was not successful.

Thus, we conclude by stating that falsely high serum phosphate is a rare but well-documented phenomenon in paraproteinemias and should not be mistaken for tumor lysis. Furthermore, incidentally detected pseudohyperphosphatemia with high serum total proteins may be a valuable clue to an underlying hypergammaglobulinemia.

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Quick Response Code:	Website: www.indianjnephrol.org
	DOI: 10.4103/0971-4065.120351