

Unexpected Test Results in a Patient with Multiple Myeloma

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CASE DESCRIPTION

A 53-year-old male patient with an established diagnosis of IgG λ multiple myeloma was seen by a hematologist–oncologist in consultation from an outside hospital. He had previously received 1 cycle of chemotherapy treatment, but he was found to be intermittently noncompliant with his therapy. The patient reported occasional nosebleeds and fatigue. Except for a slightly cachectic appearance, the physical examination was unremarkable. Laboratory results are shown in Table 1.

Serum protein electrophoresis revealed monoclonal paraproteinemia in high abundance marked by an intense band in the γ region. Immunofixation electrophoresis was not ordered at that time, but it was previously performed at another institution and was positive for IgG monoclonal protein.

The attending pathologist noted the discrepancy between the presence of a monoclonal band by serum protein electrophoresis and the patient's quantitative immunoglobulin measurements. Several additional suspicious test results were also noted.

Questions to Consider

- What are some expected laboratory results in a patient with multiple myeloma?
- Which of the patient's laboratory test results are unexpected given his diagnosis of multiple myeloma?
- What types of laboratory errors can occur in patients with multiple myeloma?

Final Publication and Comments

The final published version with discussion and comments from the experts will appear in the November 2014 issue of *Clinical Chemistry*. To view the case and comments online, go to <http://www.clinchem.org/content/vol60/issue11> and follow the link to the Clinical Case Study and Commentaries.

Educational Centers

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| Laboratory test ^a | Reference interval | Result |
|------------------------------|--------------------------|----------------------|
| IgG | 700–1700 mg/dL | <140 mg/dL |
| | 7.0–17.0 g/L | <1.4 g/L |
| IgA | 70.0–450.0 mg/dL | <5.0 mg/dL |
| | 0.7–4.5 g/L | <0.05 g/L |
| IgM | 50–250 mg/dL | <21 mg/dL |
| | 0.5–2.5 g/L | <0.21 g/L |
| Sodium | 135–145 mmol/L | 124 mmol/L |
| Potassium | 3.6–5.1 mmol/L | 5.2 mmol/L |
| Chloride | 100–110 mmol/L | 102 mmol/L |
| Carbon Dioxide | 21–33 mmol/L | 22 mmol/L |
| Creatinine | 0.60–1.20 mg/dL | 2.54 mg/dL |
| | 53–106 μ mol/L | 224 μ mol/L |
| Blood urea nitrogen | 8–23 mg/dL | 36 mg/dL |
| | 2.9–8.2 mmol/L | 12.9 mmol/L |
| Glucose | 65–100 mg/dL | 96 mg/dL |
| | 3.61–5.55 mmol/L | 5.33 mmol/L |
| Total calcium | 8.9–10.7 mg/dL | 9.2 mg/dL |
| | 2.23–2.68 mmol/L | 2.3 mmol/L |
| Total protein | 6.4–8.5 g/dL | 18.4 g/dL |
| | 64.0–85.0 g/L | 184 g/L |
| Inorganic phosphate | 2.50–4.60 mg/dL | 14.49 mg/dL |
| | 0.81–1.49 mmol/L | 4.68 mmol/L |
| White blood cell count | 3.7–9.7 $\times 10^9$ /L | 4.7 $\times 10^9$ /L |
| Hemoglobin | 13.3–17.2 g/dL | 8.2 g/dL |
| | 133.0–172.0 g/L | 82.0 g/L |
| Hematocrit | 38.9%–50.9% | 24.6% |
| Platelet count | 179–373 $\times 10^9$ /L | 104 $\times 10^9$ /L |
| Mean corpuscular volume | 81.2–94.0 fL | 91.6 fL |

^a Chemistry and hematology measurements were performed using the Siemens Healthcare Diagnostics ADIVA 1800 and ADVIA 2420 analyzers, respectively.

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