Tumor Lysis like Syndrome Associated with Cytomegalovirus: A Case Report

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Abstract:
Cytomegalovirus (CMV) is generally asymptomatic in immunocompetent patients. The most common clinical syndrome associated with CMV is mononucleosis syndrome characterized by fever, fatigue, sore throat, generalized lymphadenopathy, impaired liver function, and lymphocytosis. In this case a 51 year-old female patient was considered as having tumor lysis syndrome due to presentation with weight loss, fever and night sweats and high levels of creatinine and uric acid. In this case lymphoproliferative diseases were the first to be investigated, however corresponding test results were negative and the serological tests showed an active CMV infection.

Keywords: Cytomegalovirus; Tumor lysis syndrome

Introduction

CMV, a double strand DNA virus, is a member of herpes virus family and beta-herpesvirus subfamily. Most people are infected with CMV sometime in their lives. People in developing countries are generally infected with CMV quite early in their lives. CMV infection usually occurs in perinatal period and infancy or by sexual contact during adulthood. While congenital infections significantly cause mortality and morbidity, most primary CMV infections in immunocompetent adults are either asymptomatic or causes mononucleosis like syndrome. After the primary infection, virus can cause lifelong latent or persistant infections in a variety of cells and tissues such as monocytes, macrophages, neutrophils, leukocytes, lymphocytes, vascular endothelial cells, kidney epithelial cells, salivary glands [1-5].

Tumor lysis syndrome (TLS) is a manifestation caused by rapid lysis of tumor cells and may lead to fatal metabolic abnormalities. These abnormalities are caused by the leakage of intracellular ions, nucleic acids, proteins and metabolites from intracellular space to extracellular space of tumor cells. Rapid leakage of metabolites can disrupt hemostasis and cause uremia, hyperuricemia, hyperkalemia and hyperphosphatemia. Whereas, hypocalcemia which is a common condition in tumor lysis syndrome can develop secondary to hyperphosphatemia [6,7].

In this case report, an immunocompetent patient with tumor lysis syndrome and acute kidney failure caused by CMV infection was presented.

Case Report

A 51 year-old female patient, married with children, was admitted to emergency department with general poor health. She had no history of any prior disease except hypertension. Physical examination revealed confusion, dyspnea, decreased urine output, chest pain, and pretibial edema. Her body temperature was 40 degrees celsius, respiration rate was 26 per minute, and blood pressure was 100/55 mm/hg. Posterio-anterior chest radiograph showed pleural effusion and increased infiltration of right para-cardiac region. ECG did not reveal any finding related with ischemia. Abnormalities were present in liver function tests and kidney function tests at the time of hospitalization (Table 1). Additionally, she had leukocytosis and thrombocytopenia.

<table>
<thead>
<tr>
<th></th>
<th>Admission</th>
<th>Pre-dialysis</th>
<th>Post-dialysis</th>
<th>Follow up at the clinic</th>
<th>Discharge</th>
<th>Follow up at the outpatient clinic*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leukocyte (× 10^3/ul)</td>
<td>63.8</td>
<td>53.7</td>
<td>51.1</td>
<td>7.9</td>
<td>9</td>
<td>8.6</td>
</tr>
<tr>
<td>Thrombocyte (× 10^3/ul)</td>
<td>27</td>
<td>20</td>
<td>18</td>
<td>209</td>
<td>239</td>
<td>398</td>
</tr>
<tr>
<td>ALP(U/L)</td>
<td>475</td>
<td></td>
<td></td>
<td>213</td>
<td>210</td>
<td>126</td>
</tr>
<tr>
<td>GGT(U/L)</td>
<td>281</td>
<td></td>
<td></td>
<td>80</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Creatinine (mg/dl)</td>
<td>3.42</td>
<td>3.82</td>
<td>2.45</td>
<td>0.79</td>
<td>0.75</td>
<td>0.57</td>
</tr>
<tr>
<td>Uric acid(mg/dl)</td>
<td>12.95</td>
<td>12.97</td>
<td>7.35</td>
<td>4.2</td>
<td>4.8</td>
<td>4.5</td>
</tr>
<tr>
<td>CRP(mg/dl)</td>
<td>25.1</td>
<td>24</td>
<td>3.49</td>
<td>2.37</td>
<td></td>
<td>0.7</td>
</tr>
</tbody>
</table>
However, when the consequent CT scan revealed significant regression in size and number of mediastinal and hilar lymph nodes. Isolated high uric acid levels are expected in spontaneous TLS due to high turnover rate of tumor cell and reuse of phosphate and potassium levels accompany high uric acid levels due to cell lysis [6,7].

Our patient had high uric acid levels, hyperphosphatemia, and hypocalcemia at the time of admission. Hyperkalemia was not present. Therefore, patient was considered to have tumor lysis syndrome. Isolated high uric acid levels are expected in spontaneous TLS due to high turnover rate of tumor cell and reuse of phosphate and potassium. This type of TLS is seen in patients who didn’t take chemotherapy and with malignant cells that can use ions secreted to extracellular space. On the other hand, during chemotherapy high phosphorus and potassium levels accompany high uric acid levels due to cell lysis [6,7].

Since our patient did not receive chemotherapy and had only high levels of uric acid, she was thought to have spontaneous TLS. Therefore she was evaluated for hematological malignancies. High leukocyte and LDH levels supported our hypothesis. Bone marrow biopsy was reported as ‘normo-cellular bone marrow’, t(9:22) mutation was negative, and AML and ALL panels in cytogenetic study were also both negative. CT scan revealed significant regression in lymphadenopathies.

Table 1: Depicts the results of liver and kidney function tests.

<table>
<thead>
<tr>
<th>Procalsitonine (ng/ml)</th>
<th>8.71</th>
<th>5.51</th>
<th>0.7</th>
<th>0.28</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESR (mm/hr)</td>
<td>15</td>
<td>24</td>
<td>37</td>
<td>30</td>
</tr>
<tr>
<td>CMV serology</td>
<td>0.09 (negative)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cmv viral load (copy/ml)</td>
<td>10,571</td>
<td>21,271</td>
<td></td>
<td></td>
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</tbody>
</table>

| *Infectious Diseases Outpatient Clinic |

Discussion

Tumor lysis syndrome is an oncologic emergency that is typically seen in malignancies with high turn over rates such as acute leukemia, high grade lymphoma, germ cell tumors, and small lung cancer. Our patient had high uric acid levels, hyperphosphatemia, and hypocalcemia at the time of admission. Hyperkalemia was not present. Therefore, patient was considered to have tumor lysis syndrome. Isolated high uric acid levels are expected in spontaneous TLS due to high turnover rate of tumor cell and reuse of phosphate and potassium. This type of TLS is seen in patients who didn’t take chemotherapy and with malignant cells that can use ions secreted to extracellular space. On the other hand, during chemotherapy high phosphorus and potassium levels accompany high uric acid levels due to cell lysis [6,7].

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Since our patient did not receive chemotherapy and had only high levels of uric acid, she was thought to have spontaneous TLS. Therefore she was evaluated for hematological malignancies. High leukocyte and LDH levels supported our hypothesis. Bone marrow biopsy was reported as ‘normo-cellular bone marrow’, t(9:22) mutation was negative, and AML and ALL panels in cytogenetic study were also both negative. CT scan revealed significant regression in lymphadenopathies.

When the patient was evaluated for other possible malignancies, all tumor markers came out negative.

In conclusion, it should be emphasized that in patients with widespread lymphadenopathy and leukocytosis, CMV infection should be considered. Additionally, this condition might also be seen in other viral infections which lymphadenopathies accompany.

In the comprehensive literature research, no case, presenting CMV infection causing tumor lysis like syndrome was found.

References