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# Life-Threatening Pancytopenia after Azathioprine Conversion in a Kidney Transplant Recipient

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**Case Study :** Introduction Azathioprine is commonly used as an alternative to mycophenolate mofetil in kidney transplant recipients planning pregnancy. Although generally considered safe, severe hematologic toxicity may rarely occur. We report a case of life-threatening azathioprine-induced pancytopenia in a kidney transplant recipient. Case Report A 34-year-old woman with end-stage renal disease due to congenital urinary tract malformation underwent deceased-donor kidney transplantation in 2019. Maintenance immunosuppression included tacrolimus, mycophenolate mofetil, and low-dose methylprednisolone with stable graft function. During pre-pregnancy planning, mycophenolate mofetil was replaced with azathioprine (100mg/day). Soon after conversion the patient developed fever up to 39C, severe weakness, dizziness, and alopecia. Laboratory evaluation revealed critical pancytopenia: leukocytes $0.3\times10^9$/L, platelets $13\times10^9$/L, erythrocytes $2.51\times10^{12}$/L, and hemoglobin about 69g/L, indicating extremely high risk of bleeding and septic complications. The patient was urgently hospitalized with drug-induced cytopenic syndrome and febrile neutropenia. Azathioprine was immediately discontinued. Treatment included granulocyte colony-stimulating factor (filgrastim 300μg/day), meropenem (1g intravenously twice daily), and transfusion support. Progressive hematologic recovery was observed: leukocytes increased to $8.45\times10^9$/L, hemoglobin to 89-90g/L, and platelet levels gradually improved. Renal graft function remained stable (creatinine 1.4-1.6mg/dL). At discharge the patient continued tacrolimus prolonged-release 3.5mg/day and methylprednisolone 4mg/day. Azathioprine was considered the most probable cause based on the temporal relationship with cytopenia onset, exclusion of active viral infections, and recovery after drug withdrawal. Pharmacogenetic testing revealed ABCB1 c.2677T>G (C/C), IMPDH1 c.580-106G>A polymorphism, and reduced CYP3A5 activity. Conclusion Severe azathioprine-induced pancytopenia may occur even at standard doses in kidney transplant recipients. Prompt drug withdrawal and supportive therapy allowed hematologic recovery with preserved graft function. Pharmacogenetic susceptibility may contribute to severe thiopurine toxicity and should be considered when modifying immunosuppressive therapy.

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| Parameter | At Admission | Day 3 | Day 5 | Day 7 | At Discharge |
|---|---|---|---|---|---|
| Leukocytes ($\times10^9$/L) | 0.3 | 1.29 | 3.22 | 5.42 | 8.45 |
| Hemoglobin (g/L) | 69 | 73 | 85 | 90 | 89 |
| Platelets ($\times10^9$/L) | 13 | 61 | 48 | 23 | 42 |