Background:

It is not clear whether therapy for AML can be administered to patients with chronic kidney disease on hemodialysis. There is limited experience available on what regimen to use, dose-adjustments, adverse events, or efficacy of therapy in patients on hemodialysis. We report a case of a 47-year-old woman who presented with AML while on chronic hemodialysis, who received induction chemotherapy with manageable toxicity and clinical benefit.

Case Discussion:

A 47-year-old woman with history of end-stage renal disease on hemodialysis presented to our institution with worsening fatigue and dyspnea for two weeks. Initial laboratories showed leukocytosis associated with severe anemia and thrombocytopenia. Bone marrow biopsy was consistent with AML. Chromosomal analysis showed a normal 46 XX karyotype. She was induced with a regimen used for relapsed or refractory AML, consistent of mostly hepatically metabolized drugs, mitoxantrone and etoposide. She was maintained on tri-weekly hemodialysis.

Her treatment was complicated by mucositis, neutropenic fevers, and prolonged pancytopenia. The day 14 and day 47 bone marrow biopsy showed no evidence of leukemia. By day 49 she was in complete remission. After a prolonged recovery, she was admitted to the hospital on day 130 for consolidation chemotherapy. A blood count on admission showed falling platelets and bone marrow biopsy showed relapse. She was re-induced with cytarabine and idarubicin.

The 2nd induction chemotherapy was complicated by prolonged pancytopenia, neutropenic fever, and multiple infections. A repeat bone marrow biopsy on day 182 showed persistent leukemia, and chromosomal analysis showed a translocation (5;12)(q31;p13). She was placed on hospice.

Discussion:

AML is an aggressive malignant disease of the bone marrow that left untreated results in rapid clinical decline and death. First line induction chemotherapy regimen involves an anthracycline in combination with cytarabine. The combination has been shown to affect kidney function, and in the setting of renal failure, high-dose cytarabine has been associated with severe neurotoxicity.

The decision to treat our patient with a combination of mitoxantrone and etoposide was based on the pharmacokinetics of the drugs. Both drugs are mostly hepatically metabolized, and have shown little to no membrane permeability in hemodialysis. Our patient clearly showed an impressive clinical response with a manageable side-effect profile. Her relapse was not unexpected, as her “normal karyotype” carried an intermediate-risk prognosis, and the new chromosomal aberration found on relapse carried a poor prognosis. In conclusion, induction chemotherapy can be given effectively and safely to patients with AML and chronic renal failure on hemodialysis; such life-saving therapy should not be denied to this subset of the population.

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