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Editorial

Anemia during Direct-Acting Antiviral Regimens in Kidney Transplant Recipients with Hepatitis C

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Saxena et al. [1] reported the safety and efficacy of current direct-acting antiviral (DAA) therapies in liver transplant (LT), kidney transplant (KT) and dual liver kidney (DLK) transplant recipients infected with hepatitis C virus (HCV). Moreover, the addition of ribavirin (RBV) to DAA therapies did not influence rates of sustained virologic response (SVR) or the incidence of graft rejection. In addition, patients taking RBV were more likely to develop anemia (36%) as a common adverse effect, compared with patients not receiving RBV (3%) [1]. In a similar vein, Fernandez and colleagues [2] reported Grade 2 or 3 anemia in 33% of patients receiving RBV-containing regimens versus 15% of patients receiving no RBV. Our results agree with the results above from both studies. Notably, anemia was one of the serious adverse effects we observed in our KT patients with chronic hepatitis C during treatment with interferon-free regimens [3].

In KT recipients, anemia depends on several factors: presence of advanced liver fibrosis, renal function, and the duration between KT and the start of antiviral treatment. Previous studies had established that interleukin-6 and lipopolysaccharide stimulate hepatic expression of hepcidin. Hepcidin subsequently inhibits duodenal absorption of iron [4], aligning with observations that

iron metabolism appears to be disrupted in patients with advanced liver fibrosis. Alternatively, anemia has also been associated with chronic renal disease, as decreased erythropoietin production was observed to be mediated by renal insufficiency and other factors [4]. Another study has supported this association, demonstrating that approximately one-half of patients were reportedly anemic at six months post-KT, while post-KT anemia was observed in one-third of patients during the first five years [5].

Notably, Saxena et al. reported that their study included 28% of KT patients with cirrhosis and only 5% of those had an estimated glomerular filtration rate (eGFR) ≤ 30 mL/min [1]. Fernandez et al. [2] also reported a similar percentage (35%) of KT-patients with cirrhosis, with only 12% having eGFR < 30 ml/min and a median interval between KT and the start of antiviral treatment of 147 months. Furthermore, Kogiso et al. [6] reported that 11 KT recipients treated with DAAs exhibited SVR rates of 100%; however, severe anemia was observed in several KT recipients with renal impairment and/or cirrhosis during DAAs treatment for chronic hepatitis C even in the absence of RBV [3].

Comorbidities of HCV infection and chronic kidney disease might present in two ways: HCV infection during dialysis and HCV-associated kidney diseases [7]. Because prevalence of HCV infection in KT recipients is higher than in the general population, careful attention should be paid to administer DAAs without RBV for treatment of KT-recipients with chronic hepatitis C.

Author Contributions

T.K., S.M. and M.M. searched the literature, discussed the results and wrote the article.

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Competing Interests

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