DOACS in End Stage Renal Disease

Avani Prabhu [1], Bhakti Singh [1], Anvi Peddi [1], Haritha Pabathi [1], Jawed Fareed [2]
1 - Global Thrombosis Forum, Suwanee, GA and 2 - Loyola University, Chicago, IL.

Background

Since their introduction, the use of DOACs has significantly expanded. Warfarin has been the preferred anticoagulant for patients with AF, VTE, and severe renal impairment. Apixaban and rivaroxaban require careful consideration in all-risk populations, such as those with kidney disease. As patients with ESRD are at risk for both bleeding and thrombotic events, close attention is essentioal to mitigate the additional rtisks associated with anticoagulation.

Methods

We reviewed the lierature on DOACs in patients with ESRD to determine whether any DOACs could be used safely in this population.

Results

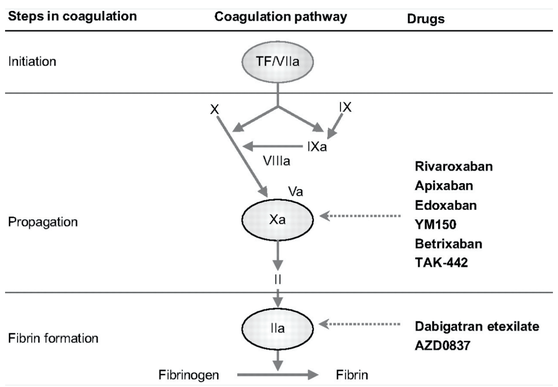

Figure 1: Sites of action of apixaban and dabigatran.

Stages of CKD

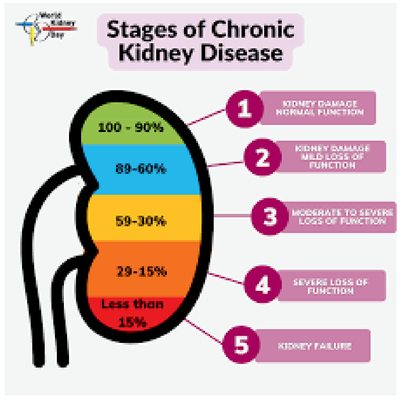

Figure 2: As CKD progresses, the kidney loses its ability to filter waste from the blood.

Apixaban is a direct Factor XA inhibitor.
Peak effect within 1-2 hours and a half-life of 12 hours.
Dabigatran is a direct thrombin inhibitor.
Peak effect within 2 hours and a half-life of 12-14 hours.
For renal impairment, apixaban clinical efficacy and safety studies did not include patients with ESRD on dialysis. For patients with ESRD undergoing intermittent hemodialysis, the recommended dose of apixaban is 2.5 mg twice daily for those with AF who meet two of three frailty criteria: age >= 80 years, body weight <= 60 kg, or serum creatinine > =1.5 mg/dL. The dose adjustment for dabigatran depends on the indication: For AF, no adjustment is needed with CrCl > =30 mL/min. When CrCl is between 15 to < = 30 mL/min, the dose should be reduced to 15 mg twice daily. When CrCl is < = 15 mL/min, dabigran should be avoided. For deep vein thrombosis (DVT), no dosage adjustment is needed for CrCl < = 30 mL/min, but its use should be avoided if CrCl < 30 mL/min.
A meta analysis of 4,000 patients with 45 trials tested the use of DOACs in patients with CKD, finding them safe and effective for patients with mild to moderate CKD. In the 2020 systematic review that included nine studies (two of which were receiving dialysis) found similar efficacy with DOACs versus Warfarin and similar bleeding risks with apixaban versus warfarin.
Of all DOACs, apixaban has the least degree of renal elimination, and apixaban has been found to be suitable in patients with AF or VTE and with end-stage renal disease (CrCl <15 ml/min; ESRD) or on hemodialysis.
Both anticoagulants come with the risk of bleeding, but Apixiban has a lower risk of bleeding in underwieght patients than dabigatran.

Conclusion

Many patients who need DOACs suffer from ERSD. Apixaban is excreted through the liver and dabigatran is excreted through the kidney. Therefore, apixaban is a better choice for patients with ERSD. For patients with ESRD, apixaban is preferred to dabigatran due to its excretion through the non-renal pathways. Periodic monitoring is not required in these patients, which is a distince advantage for apixaban. Since renal impairment affects PK, periodic monitoring of patients with signs of bleeding may be considered.