**Table 1. Characteristics of different NOACs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Dabigatran** | **Rivaroxaban** | **Edoxaban** | **Apixaban** |
| Mechanism of action | anti-thrombin | anti-factor Xa | anti-factor Xa | anti-factor Xa |
| Bioavailability | 7% | 66% | 50% | 60% |
| T max (hours) | 1.5 | 2.5 | 3 | 1-5 |
| T ½ (hours) | 9 – 17 | 6 – 13 | 12 | 12 |
| Dosing | b.i.d | once daily | b.i.d | once daily |
| Renal excretion | high | moderate | moderate | moderate |
| Hepatic metabolism | low | moderate | moderate | moderate |
| Reversal agents | idarucizumab \*  aripazine | andexanet alfa  aripazine | andexanet alfa  aripazine | andexanet alfa  aripazine |

**\*** Idarucizumab is the only FDA-approved specific reversal agent currently

T max, time to peak plasma level; T½, half-life; GIB, gastrointestinal bleeding

**Table 2. Risk factors for NOAC-related GIB**

|  |  |
| --- | --- |
| **Risk factors** | **Definition** |
| Higher dose of dabigatran and edoxaban | Dabigatran: a dose of 150 mg b.i.d  Edoxaban: a dose of 60 mg daily |
| Concomitant use of ulcerogenic agents | Antiplatelet agents, NSAIDs or steroid |
| Older age | Age ≥ 75 years |
| Renal impairment | Creatinine clearance <50 ml/min |
| Prior history of peptic ulcers or GIB |  |
| *Helicobacter pylori* infection |  |
| Pre-existing GI tract lesions | Examples like diverticulosis, angiodysplasias |
| Ethnicity | Western population |
| HAS-BLED score | Score of ≥ 3 |
| **Protective factors** | **Definition** |
| Gastroprotective agents | Proton pump inhibitors or histamine H2-receptor antagonists |

NOAC, novel oral anticoagulant; GIB, gastrointestinal bleeding; NSAIDs, non-steroidal anti-inflammatory drugs

**Table 3. Components of HAS-BLED bleeding risk score**

|  |  |  |
| --- | --- | --- |
| **Clinical characteristics** | **Definition** | **Points** |
| **H**ypertension | Systolic blood pressure > 160 mmHg | 1 |
| **A**bnormal liver or renal function | Chronic liver disease (eg, cirrhosis) or biochemical evidence of significantly impaired liver function (eg, bilirubin >2 times the ULN plus one or more liver enzymes > 3 times the ULN  Chronic dialysis, renal transplantation, or serum creatinine ≥ 200 micromol/L | 1 or 2 |
| **S**troke | Previous history of stroke | 1 |
| **B**leeding tendency or predisposition | Bleeding disorder or previous bleeding episode requiring hospitalization or transfusion | 1 |
| **L**abile INRs | Labile INRs in patients taking warfarin  (failure to maintain a therapeutic range at least 60% of the time) | 1 |
| **E**lderly | Age > 65 years | 1 |
| **D**rugs | Concomitant antiplatelet agents or NSAIDs  Excessive alcohol use (≥ 8 units per week) | 1 or 2 |

\* Maximum score is 9

ULN, upper limit of normal; INR, international normalized ratio; NSAIDs,

non-steroidal anti-inflammatory drugs