Assessment of Dabigatran, Rivaroxaban and Apixaban With Respect to Drug-Drug Interaction in a University Hospital

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Background: Vitamin K antagonists are used in the treatment and prevention of thrombosis. New oral anticoagulants (NOAC) have been developed in recent years. These include the thrombin inhibitor dabigatran, the factor Xa inhibitors rivaroxaban and apixaban. We aimed to evaluate potential drug-drug interactions (PDDI) that could be presented by pharmacokinetic (PK) and pharmacodynamic (PD) pathways of NOACs, which are prescribed in a university hospital.

Methods: All prescriptions of patients who were prescribed NOAC in Gazi University Medical Faculty Hospital between November, 2012 and November, 2017 were reviewed retrospectively for PK and PD PDDI for 6 months from the date of NOAC prescription. Hospital Information Management System data were used. PDDI assessment was based on prescribing information of drugs, PK and PD interaction mechanisms and literature information. Prescription with P-glycoprotein and CYP3A4 inducers and inhibitors has been considered as PK interaction. Prescription with other medications that may increase the risk of bleeding has been considered as PD interaction. Descriptive and percentage statistical evaluations were performed.

Results: 2023 patients (mean age 70.3 +/−13.1 years) who received NOAC treatment were included. Among these patients, 552 used dabigatran, 1107 used rivaroxaban and 364 used apixaban. 1031 of 11139 prescriptions (9.26%) written to 2023 patients contained PDDI in terms of PK and/or PD. These 1031 prescriptions included 554 patients (27.4% of all patients). Of these patients, 77.1% were 65 years of age or older. When prescriptions containing PDDI (1031 prescriptions) were analysed in terms of PK/PD interaction and drug groups, data were found as shown in the table.

Conclusions: A significant proportion of the prescriptions of patients who use NOAC contains PDDI (9.26%). The majority of PDDI was PD. These drugs may be prescribed together to enhance therapeutic effect. However, the high percentage of PDDI in which selective serotonin reuptake inhibitors / serotonin noradrenaline reuptake inhibitors are found suggests that prescribing physicians may be not aware of this interaction or that there are no safer alternatives. In terms of PK, it would be beneficial to recommend monitoring during their use with P-glycoprotein and/or CYP3A4 inhibitors.