NSC) database consisted of 1 million beneficiaries (2.2% of the total eligible Korean population). The patients over 20 years old with hyperlipidemia were extracted from the NHIS-NSC database in year 2002 to 2013. Of those, we compared the statin users with non-users using propensity-score matching (PSM) by 1:1 ratio to reduce the bias of confounding factors. During the follow-up period, the primary outcome was the risk of ICH. The secondary outcome was the 30-day mortality after ICH incidence, cardiac mortality, and incidence of ischemic stroke. The cox proportional hazard model was performed to evaluate the ICH risk of statin use. Subgroup analyses were performed for the primary outcome according to the risk factors related to ICH.

Results: After PSM, 56 078 patients were included out of total 275 512 adults with hyperlipidemia. During the mean follow-up period of 4.7 years, ICH occurred in 228 patients. Statin use had no significant association in increasing the risk of ICH (adjusted HR [aHR], 0.84; 95% CI, 0.64-1.08; $p = 0.18$). Among patients with type 2 diabetes, the risk of ICH was lower in statin users than non-users (aHR, 0.63; 95% CI, 0.41-0.97; $p = 0.03$). Statin therapy was significantly associated with reduced the cardiac mortality and incidence of ischemic stroke (aHR, 0.49; 95% CI, 0.43-0.56; $p \leq .0001$ and aHR, 0.88; 95% CI, 0.82-0.95; $p = 0.001$, respectively). However, there were no significant differences in the 30-day mortality after ICH incidence between statin and non-users (incidence, 26.0% and 22.6%; $p = 0.55$).

Conclusions: In comparison of statin users with non-users, statin therapy was not associated with the risk of ICH with improvements of the ischemic cardiac and cerebrovascular outcomes.

1018 | Statins and new-onset diabetes

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Background: Clinical trials evaluating statins have shown an increased risk of developing diabetes with these drugs, but dose-effect relationship remains poorly studied.

Objectives: To evaluate the association between new-onset diabetes and use of statins.

Methods: This nested case-control study was performed using data of the random representative sample of the French health care system database for the 2005-2015 period. The outcome of interest was the occurrence of new-onset diabetes identified from diagnosis data or reimbursement data for anti-diabetic drugs. The date of the first outcome identified constituted the index date; a 6-month lag-time period was considered before index date that was censored for the assessment of exposure and other studied variables. Patients aged 45 years and over with an outcome of interest between 2012 and 2015 (cases) and up to 10 case-matched controls on age, sex, numbers of different drugs dispensed and medical consultations, and use of glucocorticoids, were included in the study. The associations between use of statins and occurrence of new-onset diabetes were evaluated by odds ratios (OR) obtained by conditional logistic regression adjusted on high dimensional disease risk score.

Results: This study included 5541 cases of new-onset diabetes matched to 54 086 controls. Median duration of follow-up period before index date was 8.8 years. Analyses have shown that risk of new-onset diabetes was increased for new users of statins (statin treatment initiating in the 6-month period preceding the lag-time period; OR 1.31; 95% confidence interval 95% CI 1.01-1.71), and for patients exposed to high cumulative dose of statins (≥5 years of cumulative exposure to statins; OR 1.12; 95% CI 1.01-1.25).

Conclusions: The results of this study confirmed the increased risk of developing diabetes with the use of statins, both more important at the beginning of treatment and after prolonged use of these drugs.

1019 | Concurrent use of DOACs and pharmacodynamic interacting drugs is associated with an increased risk of major bleeding compared with patients using DOACs alone: Nested case-control study in UK CPRD

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Background: Although many studies on bleeding risk associated with use of direct oral anticoagulants (DOACs) are conducted, the effect of concurrent use of potentially interacting drugs on this risk is not well studied.

Objectives: To evaluate the association between concurrent use of DOACs with concurrent use of potential pharmacokinetic or pharmacodynamic interacting drugs on major bleeding.

Methods: We used data from the UK Clinical Practice Research Datalink (period 2008-2015) to conduct a nested case-control study in a cohort of new users of DOACs (dabigatran, apixaban, and rivaroxaban). Cases were patients who were hospitalized with a primary discharge diagnosis of major bleeding while taking DOACs. Up to four controls were matched to each case on age, sex, and index date. Controls also had to be a current user of a DOAC on the index date. Conditional logistic regression analysis was used to calculate odds ratios (OR) and 95% confidence intervals (CI) to estimate the risk of major bleeding associated with concurrent use (30 days prior to the index date) of potential pharmacokinetic or pharmacodynamic interacting drugs. The analysis was adjusted for well-known risk factors for bleeding

Results: We identified 393 cases from 29 120 new users of DOACs and 1494 controls. Most subjects were current users of rivaroxaban (58.8%). The concurrent use of DOACs and pharmacokinetic interacting drugs did not increase the risk of major bleeding vs use

of DOACs alone (45.0% vs 51.2%, adjusted OR 0.90; 95% CI 0.60-1.36). However, concurrent use of pharmacodynamic interacting drugs was associated with an increased risk of major bleeding (21.6% vs 13.5%, adjusted OR, 1.91; 95% CI, 1.39-2.62). This effect was mainly driven by selective serotonin reuptake inhibitors (SSRIs, adjusted OR, 1.73; 95% CI, 1.12-2.65) and antiplatelet drugs (adjusted OR, 1.90; 95% CI, 1.23-2.93), respectively.

Conclusions: Among patients taking a DOAC, concurrent use of an SSRIs or antiplatelet drug was associated with increased risk of major bleeding compared with DOAC use without these drugs.

1020 | Abstract Withdrawn

1021 | The impact of antihypertensive drugs on serum potassium and sodium levels in patients electively admitted to a tertiary hospital

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Background: Abnormal serum potassium and sodium levels may lead to serious cardiovascular and neurological conditions.

Objectives: To investigate the association between the use of different antihypertensives and the risk of developing disturbances in potassium and sodium serum levels.

Methods: A cross-sectional study was conducted in antihypertensive users, electively admitted to the University Medical Center Utrecht between January 2013 and September 2016. Data on patient characteristics, antihypertensives, and electrolyte levels where extracted from the Utrecht Patient Oriented Database. The association between the use of different antihypertensives and the electrolyte level was studied using linear and logistic regression.

Results: A total of 6369 elective admissions were included in this study. The most frequent electrolyte disorder was hyponatremia (29.5%), followed by hypokalemia (20.5%). Hyperkalemia (3.4%) and especially hypernatremia (0.1%) were less common. In comparison with the use of monotherapy of beta-blockers, use of monotherapy of calcium antagonists (adj. OR 3.08; 95% CI 2.13, 4.46), thiazide or thiazide-like (adj. OR 2.08; 95% CI 1.14, 3.82) and loop diuretics (adj. OR 1.92; 95% CI 1.13, 3.28) was significantly associated with higher odds of hypokalemia. Most combinations of antihypertensives with thiazide or thiazide-like or loop diuretics were significantly associated with lower potassium serum levels compared with monotherapy of beta-blockers. None of the antihypertensive therapies were significantly associated with hyperkalemia. Monotherapy of potassium sparing diuretics (adj. OR 2.72; 95% CI 1.11, 6.66) and angiotensin receptor blockers (adj. OR 1.63; 95% CI 1.01, 2.63), and some of the combinations with a thiazide or thiazide-like or loop diuretic were significantly associated with higher odds of hyponatremia.

Conclusions: Monitoring of serum potassium and sodium levels should be encouraged in patients with antihypertensive drugs especially antihypertensives inducing hyponatremia or hypokalemia to avoid possible severe consequences of abnormal serum potassium and sodium levels.

1022 | The impact of sex on the associations between ace inhibitors and cough and angioedema: A systematic review and meta-analysis

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Background: Cough and angioedema are well-known adverse effects of angiotensin-converting enzyme (ACE) inhibitors. Some observational studies in patients using ACE inhibitors have observed that women have a higher incidence of cough and angioedema than men.

Objectives: To evaluate based on randomized controlled trials (RCTs), whether the risks of developing cough and angioedema with ACE inhibitors are modified by sex.

Methods: We searched PubMed and Cochrane databases for all years to August 2016. We included RCTs that contain information about the incidence of cough and angioedema in users of ACE inhibitors and controls (active/placebo) in men and women. We performed meta-analyses using the random effects model. Pooled risk ratios (RRs) for cough and angioedema associated with ACE inhibitors in women and men were estimated and tested for interaction.

Results: We included four RCTs in our analysis (three studies for cough and two studies for angioedema). We found that there was no difference in the RR to develop cough or angioedema for ACE inhibitors versus controls between women and men. For cough in women, the RR was 3.70; 95% CI (2.55-5.35) and for men, 2.61; 95% CI (1.30-5.27) (*P* value for interaction 0.39). For angioedema, these RRs were 5.56; 95% CI (2.45-12.62) and 6.35; 95% CI (1.81-22.36), respectively (*P*-value for interaction 0.86).

Conclusions: Our meta-analyses show that the risks of developing cough and angioedema associated with ACE inhibitors are not modified by sex. However, these findings should be interpreted cautiously due to limited number of studies involved.

1023 | Risk of mouth ulcer associated with the use of nicorandil in Korea

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