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Long Term Use of Proton Pump Inhibitors is Associated with Rapid Progression of Chronic Kidney Disease ; A Nationwide Korean Study Based on HIRA OMOP-CDM Database

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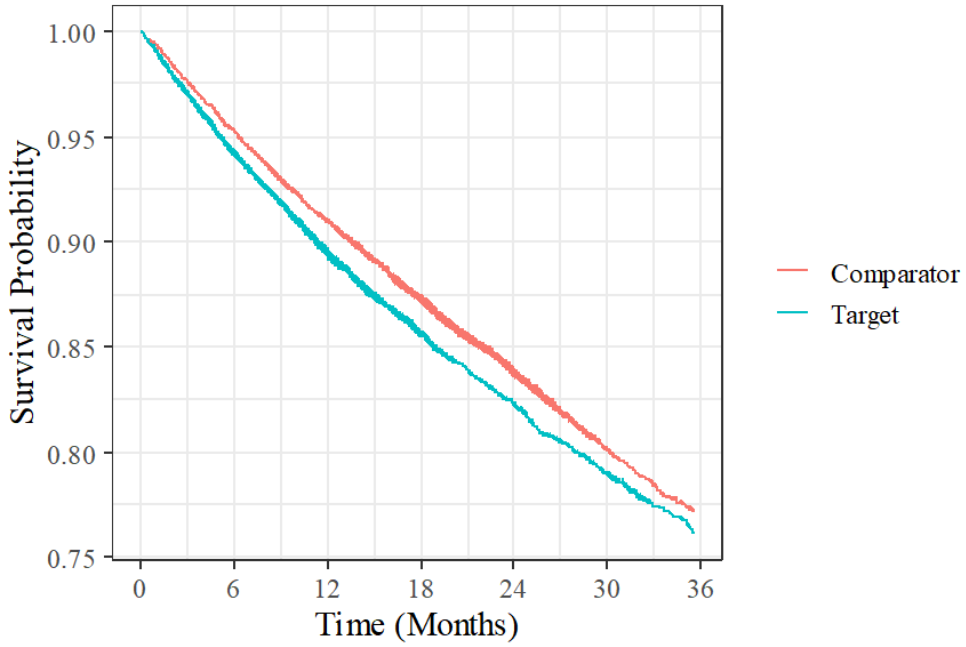
Objectives : Proton pump inhibitors(PPIs) are one of the most widely used drugs in South Korea. Several studies showed the possible nephrotoxic effects of PPIs, such as increased incidence of acute kidney injury or accelerated chronic kidney disease progression, however those effects had not been evaluated in Korean population. This study is aimed to determine whether the long term use of PPIs is associated with an increased risk of end-stage kidney disease progression compared to H2 receptor antagonist (H2RA).
Methods : Using the Health Insurance Review and Assessment (HIRA) database encoded in the Observational Medical Outcomes Partnership – Common Data Model (OMOP-CDM) version 5.3, a total of 34, 656 patients with CKD stage 3 or 4 initiating PPIs or H2RAs for more than 90 days were assembled from 2012 through 2021. ESKD progression was defined as the initiation of kidney replacement therapy (hemodialysis, peritoneal dialysis, or kidney transplantation) for more than three months. Observation period was three years, and the odds of ESKD progression was calculated in the 1:1 propensity score-matched model.
Results : After 1:1 propensity score matching, we retrieved 23,792 CKD stage 3 or 4 patients who received PPIs or H2RAs for more than 3 months. Patients were tracked up to 3 years and 2,780 (11.7%) developed ESKD. For the 11,896 PPI users, observation period was 4,719,679 days and the incidence rate of ESKD was 10.36 case/100 person- years, which was more frequent compared to those with H2RA (9.10 case/100 person-years). Risk of ESKD progression was 17% higher in PPIs users (RR 1.176(1.069-1.295), $p<0.001$), and a Kaplan-Meier survival curve showed the same trend (Fig 1).
Conclusions : In CKD stage 3 or 4 patients, long term use of PPIs, compared to H2RAs, is associated with 17% higher risk of ESKD progression in three years.

Fig1.png


Survival Probability
1.00
0.95
0.90
0.85
0.80
0.75
0
6
12
18
24
30
36
Time (Months)
Comparator
Target