377. Antidepressant Use and Risk of Hip Fracture: A Comparison of Marginal Structural Models, Conventional Regression and Propensity Score Methods

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Background: In observational studies of time-varying treatment, conditioning on time-dependent confounders that are affected by previous treatment using conventional regression methods may adjust-away(indirect) treatment effects.In the presence of unmeasured common causes of confounders and outcome, it can also induce collider-stratification bias.

Objectives: To compare time-dependent propensity scores, conventional Cox and marginal structural models (MSM) in a study of selective serotonin reuptake inhibitors (SSRI) and the risk of hip fracture (HF).

Methods: A cohort of patients with a first prescription for antidepressants (AD, SSRI or tricyclic antidepressants, TCA) was extracted from the Dutch Mondriaan GP database in the period 2001-2009.Potential confounders were ascertained when antidepressant use changed over time or at six month intervals. Follow-up began with the first day of AD prescription and ended at the occurrence of HF, death, unregistration with the GP, or end of the study.Treatment effects were estimated using time-varying Cox regression, PS stratification, covariate adjustment, and inverse probability weighting (MSM) to control for confounding. In MSMs, censoring was accounted for by including inverse probability of censoring weights (IPCW).

Results: The crude HR of HF in current SSRI users versus non-current SSRI users was 1.70 [95%CI 1.09-2.65]. Effects increased after confounder adjustment, PS stratification, and PS adjustment: HR 2.28 [1.45-3.59], 2.47 [1.54-3.95], and 2.51 [1.54-4.09], respectively.When MSMs with stabilized weights were used, the HR was 1.34 [0.65-2.76] and 1.53 [0.81-2.93] with and without accounting for censoring, respectively. After weight truncation, the HR became 2.09 [1.31-3.35] and 2.37 [1.49-3.78] with and without accounting for censoring, respectively.

Conclusions: When treatment and confounders are time-varying, accounting for informative censoring can materially influence effect estimates in addition to the potential collider-stratification and confounding bias that arise due conditioning or stratification on time-dependent confounders.Hence, the use of methods such as MSMs is recommended.

378. Preference and Propensity: Evaluating Oral Treatment of Type 2 Diabetes (T2DM)

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Background: Probability distributions such as propensity scores (PS) are increasingly used to balance between treatment groups in outcomes studies. In 2013, "preference" was introduced as a method to address imbalance via transforming the probability distribution to represent a state of interchangeability or equipoise in clinical practice. Such an assessment is useful in comparative effectiveness research to better inform provider decisions and minimize potential bias.

Objectives: We evaluated patients with T2DM augmenting therapy with either sitagliptin (SITA) or other oral medication (OTH) and compared PS and preference scores (PREF) for SITA vs OTH, vs metformin (MET), vs sulfonylureas (SU), and vs thiazolidinediones (TZD).

Methods: We assessed patients in 2006-2012 in UK general practice (CPRD). We estimated the probability of receiving SITA as a function of pre-specified characteristics and used this to develop PS and PREF. Covariate balance of PS was conferred if average standardized absolute mean difference (ASAMD) was <0.1 and for PREF if $0.3 < \text{PREF} < 0.7$ for $>50\%$ of scores.

Results: The PS and PREF comparison of SITA vs OTH was relatively balanced (ASAMD = 0.0515; >95% of SITA and OTH $0.3 < \text{PREF} < 0.7$). PS appeared Gaussian with peak around 0.1. By design, PREF peaked around 0.5 and also appeared Gaussian. Similar results were noted in SITA vs SU or TZD; but the visualized underlying population represented in PS (not PREF) shifted with each comparison. In SITA vs MET, there was slightly more imbalance (ASAMD = 0.0940; $0.3 < \text{PREF} < 0.7$ = 79% SITA and 76% MET). Visualizations appeared somewhat bimodal for MET, with a peak in PS