Adjusting for the Effect of Switching Basal Insulin Treatment on the Risk of First Severe Hypoglycaemia
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**RATIONALE**
Long-acting basal insulin analogues have shown a positive effect on the balance between glycaemic control and hypoglycaemia risk compared to NPH (Neutral Protamine Hagedorn) insulin. Hazard ratio (HR) estimates of the risk of severe hypoglycaemia (SH) using standard methods may be biased in the presence of insulin switching.

**OBJECTIVES**
To estimate and compare the incidence of first SH among type 2 diabetes mellitus (T2DM) patients treated with insulin detemir, glargine or NPH, accounting for insulin switching with the use of Marginal Structural Models (MSM).

**METHODS**
T2DM patients aged > 40 who initiated use of detemir, glargine or NPH were identified from the Finnish health care registers. The patients were followed until discontinuation of insulin treatment, death, end of 2009 or first SH event. In the MSM the causal effect of insulin use on the risk of first SH was estimated by applying the inverse of the probability to switch as weights in the Cox's Proportional Hazards (Cox PH) model. The probability to switch (from NPH to detemir or glargine) was estimated using logistic regression adjusting for both time fixed and time dependent covariates on several time grids.

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**REFERENCES**

**CONCLUSIONS**
• The benefit of using detemir or glargine over NPH remains after accounting for measured confounding on insulin switch by MSMs.
• The results were very similar for different time grids (30-180 days). The natural scale of prescription changes is 90 days.
• Further studies with more variables predicting switches are needed to account for unmeasured confounding on insulin switch.

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