Epidemiological Aspects on Assessing and Treating Dyslipidemia in Type 1 Diabetes

– Studies from the Swedish National Diabetes Register

Akademisk avhandling

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Avhandlingen baseras på följande delarbeten

I. Hero C, Svensson A-M, Gidlund P, Gudbjörnsdottir S, Eliasson B, Eeg-Olofsson K. LDL-cholesterol is not a good marker of cardiovascular disease in Type 1 diabetes. Diabetic Medicine: A Journal Of The British Diabetic Association, 2016, Vol. 33, Iss. 3, pp. 316-.323

II. Hero C, Rawshani A, Svensson A-M, Franzén S, Eliasson B, Eeg-Olofsson K, Gudbjörnsdottir S Association Between Use of Lipid-Lowering Therapy and Cardiovascular Diseases and Death in Individuals With Type 1 Diabetes. Diabetes Care 2016 Jun; 39(6): 996-1003

III. Hero C, Karlsson S, Franzén S, Svensson A-M, Miftaraj M, Gudbjörnsdottir S, Andersson Sundell K, Eliasson B, Eeg-Olofsson K. Adherence to lipid-lowering therapy and risk for cardiovascular disease and death in type 1 diabetes mellitus. *Accepted for publication BMJ Open Diabetes Research and Care*

IV. Hero C, Karlsson S, Franzén S, Svensson A-M, Miftaraj M, Gudbjörnsdottir S, Andersson Sundell K, Eliasson B, Eeg-Olofsson K. Impact of socioeconomic factors and gender on refill adherence and persistence to lipid-lowering therapy in type 1 diabetes. *Manuscript*

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– Studies from the Swedish National Diabetes Register

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Abstract

Background: Cardiovascular disease (CVD) is a major cause of shortened longevity in individuals with type 1 diabetes. Dyslipidemia is one of the important modifiable risk factors.

Aim: To investigate different aspects of dyslipidemia in type 1 diabetes: Assess available lipid variables as markers of CVD risk in type 1 diabetes. Investigate association between lipid-lowering therapy (LLT) and CVD in primary prevention. Assess the adherence to LLT and the associations between non-adherence and CVD risk. Investigate reasons for non-adherence from a sociodemographic perspective.

Method: Clinical characteristics and laboratory measures were collected from the Swedish National Diabetes Register alongside with data from several other Swedish registries on health and socioeconomy. In study I Cox regression analyses were performed to assess LDL cholesterol and total cholesterol to HDL-cholesterol ratio as predictors of CVD in type 1 diabetes. In study II we investigated the association between primary prevention with LLT and the risk of CVD in 24,230 individuals with type 1 diabetes applying propensity scores to balance the groups. In study III and IV we utilized the Swedish Prescribed Drug Register to investigate adherence and non-adherence in 6,192 individuals with type 1 diabetes and novel users of LLT, in the context of CVD and socioeconomy.

Results: Total-cholesterol to HDL-cholesterol ratio was a better predictor for cardiovascular risk in primary prevention than LDL-cholesterol, with a 12% elevated risk of CVD per 1 unit increase in the ratio.

Individuals with type 1 diabetes and no history of CVD had a 22-44% lower risk of CVD and cardiovascular death when on LLT compared to the untreated individuals. High adherence to LLT was associated with a 22% lower risk of non-fatal CVD compared to lower adherence. Individuals discontinuing LLT within 18 months had a 43% higher risk of non-fatal CVD. Lower adherence was associated with male gender, young age, marital status and country of birth.

Conclusion: The observational data from these presented studies emphasize the importance of regularly assessing and treating dyslipidemia in individuals with type 1 diabetes in order to achieve full cardioprotective treatment and lessen the cardiovascular burden in the type 1 diabetes population.

Keywords: Type 1 diabetes, LDL cholesterol, lipid-lowering treatment, cardiovascular disease, adherence, discontinuation, socioeconomic status

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