Aspects of sex and BMI on Type 1 diabetes

Background
Unlike other autoimmune diseases, males more often develop diabetes than females. The exact pathology behind this difference is unknown.

There are increasing data supporting that type 1 diabetes and type 2 diabetes (T1D, T2D) are linked to each other and to part share the same triggering factors such as increased BMI.

Further studies are needed in order to determine these associations, especially the gender difference.

Research question
Study I – What are the impact of diabetes heredity, parental education, and gender on the prevalence of overweight among 12-year-old children in Sweden?

Study II – What is the heterogeneity of children with newly diagnosed type 1 diabetes when comparing children with or without heredity for both Type 1 and Type 2 diabetes?

Study III – Is sex associated with age at onset, autoantibodies, and HLA-risk in children with Type 1 diabetes?

Study IV – What is the difference in sex, HLA and phenotype, and metabolic control among children with type 1 diabetes, with and without autoantibodies at diagnosis?

Methods
Data are collected and analyzed from the following two studies:

1. The Better Diabetes Diagnosis study (BDD Study), an ongoing Swedish national prospective cohort study and includes all the children that are diagnosed with any type of diabetes in Sweden since 2005.

2. Exploring the Iceberg of Celiacs in Sweden (ETICS) study, a cross-sectional multicenter national screening study for celiac disease in healthy 12-year-old children

Preliminary results
In study I we found that boys with parental T1D have a higher risk of being overweight than girls, but could not find any gender difference in the group with parental T2D.

In study II we found that:
- In both sexes, there is a larger proportion of children with T1D that have a family history for T1D and T2D and they have a higher risk of being overweight/obese compared to the control group.
- Children with family history of T1D get their diabetes earlier, has a lower HbA1c than those with family history of T2D and has a higher BMI than children without family history.
In study III we show that sex is associated with age at onset, autoantibody profile, and HLA risk in children with T1D which implies that environmental triggers may affect boys and girls differently.

**Significance**
Dissecting the pathogenesis of diabetes and identifying risk factors that may be approached for early interventions are key for a healthier population.

**Publications/Manuscripts:**

Manuscript II: Hedlund E, Tojjar J, Carlsson A. Heredity for diabetes and clinical course in children diagnosed with T1D

Manuscript III: Tojjar J, Cervin M, Hedlund E, Brahimi Q, Forsander G, Elding Larsson H, Lernmark Å, Ludvigsson J, Marcus C, Persson M, Carlsson A. Sex differences in age at onset, autoantibody profile and HLA-risk in pediatric Type 1 Diabetes

Manuscript IV: Tojjar J, Cervin M, Julia Schönknecht, Brahimi Q, Forsander G, Elding Larsson H, Lernmark Å, Ludvigsson J, Marcus C, Persson M, Carlsson A. Clinical course in children with different type of autoantibodies at diagnosis of pediatric Type 1 Diabetes