Growth hormone (GH) therapy has a beneficial effect on glycosylated haemoglobin (HbA1c) levels in adult patients with GH deficiency (GHD): a report from the NordiNet® International Outcome Study (IOS)

Introduction and objectives
- Adults with growth hormone deficiency (GHD) exhibit many of the metabolic abnormalities typical of the metabolic syndrome. An impaired metabolic profile includes insulin resistance and abdominal obesity, which are known risk factors for type 2 diabetes.
- Some concerns related to the undesirable effects of GH replacement therapy on glucose metabolism have been raised in the past.
- Observational studies report different findings regarding the risk of developing type 2 diabetes for adult patients with GHD who receive GH replacement therapy compared with the general population. Some studies report a slightly increased risk, while others show no increased risk.
- Consequently, the clinical significance of the effect of GH replacement therapy on glucose homeostasis in adults with GHD remains unclear.
- This study reports the impact of 4 years of continuous GH therapy on HbA1c and progression to diabetes in adult patients with GHD.

Methods
- Data for 278 patients with adult-onset (>20 years old at GH treatment start) GHD who were enrolled in the NordiNet® International Outcome Study (IOS) (NCT00960128), were analysed. NordiNet® IOS is a non-interventional observational study, evaluating the long-term effectiveness and safety of GH (Nordotropin® [somatropin], Novo Nordisk, A/S) in a real-life, clinical setting.
- Patients included in this analysis had adult-onset GHD and had been treated with GH for ≥4 years. Baseline was the start of GH treatment.
- Change in HbA1c (ΔHbA1c) from baseline at each yearly visit up to 4 years was calculated for all patients by GH dose group (≤0.2 mg/day, >0.2 mg/day during first year of treatment). Patients were stratified based on a clinically relevant decrease in HbA1c (≤0.3% decrease), unchanged HbA1c, or a clinically relevant increase in HbA1c (≥0.3% increase), and by baseline glycaemic metabolic status at each yearly visit up to 4 years.
- Baseline glycaemic metabolic status was defined thus: low-normal, HbA1c ≤5.8%; pre-diabetes/high-normal, HbA1c 5.9–6.4%; diabetes, HbA1c ≥6.5% and patients with known diabetes or receiving anti-diabetes medication.
- Descriptive statistics were applied for all parameters. A paired t-test was used to analyse ΔHbA1c from baseline and a chi-squared test was used to determine if there was an association between GH dose and ΔHbA1c from baseline, or between GH dose and change from baseline glycaemic metabolic status.

Results
- Baseline demographics for the 278 patients (48% female) are presented in Table 1.
- Overall, mean HbA1c levels were stable over the 4-year study period. The mean (SD) HbA1c, from baseline to year 4 of GH treatment for all patients 0.03% (0.58%) (n=278).
- At baseline, the mean (SD) were similar for female (5.31% [0.86], n=134) and male (5.27% [0.86], n=144) patients. The mean (SD) HbA1c, from baseline to year 4 of GH treatment were 0.02% (0.69) and 0.04% (0.47), respectively.

Disclosures
- M. Weber, J. Christiansen and C. Høybye are members of NordiNet® IOS International Study Committee; E. Pournara and B. Tennes Pedersen are employees of Novo Nordisk.

References

Conclusions
- Four years of GH replacement therapy in adult patients with GHD was not associated with a deterioration in HbA1c and the proportion who developed diabetes was not increased over that expected in the general age-matched population.
- GH dose >0.2 mg/day was associated with a greater proportion of patients showing a clinically significant decrease in HbA1c, after 1 year than patients receiving GH dose ≤0.2 mg/day.
- Almost half of patients with pre-diabetes/high-normal HbA1c at baseline showed a clinically relevant improvement in their glycaemic metabolic status after 4 years of GH therapy.

This study was sponsored by Novo Nordisk Health Care AG. NordiNet® International Outcome Study is registered at ClinicalTrials.gov NCT00960128. The authors take full responsibility for the content of the poster but are grateful to Watermeadow Medical (supported by Novo Nordisk Health Care AG) for writing assistance. Presented at the 17th European Congress of Endocrinology (ECE), 16–20 May 2015, Dublin, Ireland.