Glucose profiles in healthy volunteers assessed by CGMS (Guardian)

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**Background/Introduction**
Continuous monitoring of subcutaneous glucose levels is feasible with the Guardian® REAL-Time CGMS, providing additional information about glucose fluctuations in diabetic patients. However, only few data are available describing normal glucose fluctuations, i.e. continuous glucose profiles in healthy people, and there are no data published yet for caucasians.

**Methods**
Inclusion of healthy volunteers, 18 to 50 years old, with normal BMI and normal OGTT, who had the instruction and placement of the Medtronic® Guardian® REAL-Time CGMS for 48 hours, and who were leading a protocol of carbohydrate intake and physical activity.

**Results**
A total of 15 probands (7 male/8 female) were included: mean age (SD) 39.8 (9.3) years, mean BMI 21.3 (1.5), mean daily carbohydrate intake 251 (96) g with a minimal intake of 100 g and a maximum intake of 510 g, and a median daily physical activity of 9.5 min (minimum 0 min, maximum 110 min). There were no problems with the Guardian® REAL-Time CGMS, and complete data set were created for all probands with a total of 10,329 glucose readings. The mean 24h glucose concentration was 5.31 (0.87) mmol/L, the minimal glucose level was 3.44 mmol/L, the maximum glucose level 7.55 mmol/L. Glucose readings of the CGMS and the capillary blood glucose levels (for calibration) correlated well (R=0.22, p=0.011).

**Conclusion**
In healthy volunteers there is a very tight control of glucose fluctuations as assessed with the Guardian® REAL-Time CGMS. Although, there was a great difference in carbohydrate intake and physical activity, glucose concentrations almost always remained in the noninsoglycemic range.

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Familial non-autoimmune hyperthyroidism due to an activating TSH receptor mutation

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**Background/Introduction**
The most frequent causes for hyperthyroidism are Graves’ disease and thyroid nodules with autonomous function which account for more than 90% of thyrotoxicosis.

**Case Report**
A 63-year-old man with a history of hyperthyroidism first described in childhood was referred.

**Discussion**
Despite negative TSH, the presence of autonomous function which account for more than 90% of thyrotoxicosis was confirmed by a mutation in the TSHR gene (Gly431Ser) in the first membrane spanning domain of the TSHR, confirming the diagnosis. Whereas both children underwent thyroid ablation with 131I, our patient has denied thyroidectomy or treatment with radioiodine.

**Conclusion**
In this case report, a mutation in the TSHR gene was found, confirming the diagnosis of familial non-autoimmune hyperthyroidism. This mutation is rare, but confirms the genetic basis of this rare disease.

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Association between circulating cytokine levels, diabetes and insulin resistance in a population-based sample (CoLaus study)

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**Background/Introduction**
The objective of this study was to assess the associations between diabetes, insulin resistance (assessed by HOMA), metabolic syndrome and cytokine (interleukin-1β, interleukin-6 – IL-6 and tumor necrosis factor-α – TNF-α) and high sensitivity C-reactive protein (hs-CRP) in a healthy Caucasian population.

**Methods**
Population sample of 2884 men and 3201 women aged 35 to 75. CRP was assessed by immunoassay, the other cytokines were assessed by multiplexed particle-based flow cytometric assay. An oral glucose tolerance test was performed in a subgroup of 532 randomly selected participants to screen for impaired glucose tolerance (IGT).

**Results**
IL-6, TNF-α and hs-CRP were significantly and positively correlated with fasting plasma glucose, insulin and HOMA-IR. Participants with diabetes had higher IL-6, TNF-α and hs-CRP levels than non-diabetic; after multivariate adjustment this difference persisted for hs-CRP only. Participants with metabolic syndrome had higher IL-6, TNF-α and hs-CRP levels and these differences persisted after multivariate adjustment. Participants in the highest quartile of HOMA-IR had higher IL-6, TNF-α and hs-CRP levels, but these differences persisted for TNF-α and hs-CRP only after multivariate adjustment. No associations were found between IL-1β and insulin resistance markers studied. Finally, participants with IGT had higher hs-CRP levels than participants with a normal OGTT, but this difference disappeared after adjusting on body mass index.

**Conclusion**
Subjects with diabetes, metabolic syndrome and increased insulin resistance present with higher levels of hs-CRP, while no association was found with IL-1β. The increased inflammatory state of subjects with IGT appears to be mediated by BMI.
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