Diabetes disease in its complexity

Clinician’s perspective

Prof. Dr. Chantal Mathieu
Endocrinology, University Hospital KU Leuven
Belgium
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Goal of therapy in diabetes mellitus

Quantity of life*

and

Quality of life*

*mainly determined by complications
Diabetic complications

- Eyes (retinopathy)
- Brain and cerebral circulation (cerebrovascular disease)
- Heart and coronary circulation (coronary heart disease)
- Kidney (nephropathy)
- Lower limbs (peripheral vascular disease)
- Peripheral nervous system (neuropathy)
- Diabetic foot (ulceration and amputation)
I believe that I must manage safety and efficacy but it is difficult to effectively manage both with insulin.

I would treat my patients more aggressively if there was no concern about hypoglycaemia.

GAPP™ study: Hypoglycemia as obstacle for therapy for doctors

GAPP™
- A global internet survey of patient and physician beliefs regarding insulin therapy
- N=1250 physicians

Therapy of diabetes = risk factor management

• Microvascular complications: Glycemic control
• Macrovascular complications:
  – Lifestyle
  – Weight
  – Blood pressure
  – Lipids
  – Glycemic control
  – ....
• Cancer risk
Therapy of diabetes = risk factor management

• Microvascular complications: **Glycemic control**

• Macrovascular complications:
  – Lifestyle
  – Weight
  – Blood pressure
  – Lipids
    – **Glycemic control**
    – ....

• Cancer risk
Type 1 diabetes

= Destruction of beta cells

Therapy: Replacement of all beta cell functions
Replacing all beta-cell functions
Type 1 diabetes: Tools

- Insulin
- Education and self-monitoring of blood glucose
- Diet
- Lifestyle
Tools

• Insulin
• Education and self-monitoring of blood glucose
  • Diet
  • Lifestyle
Achieving glycemic control
Pathophysiology of T2DM

T2DM as a Dual Disease:

β-Cell Failure

Insulin Resistance
Unhealthy lifestyle and environmental factors

Failing beta-cells

Insulin resistance
Metabolic syndrome
Increased risk of cardiovascular disease
Hyperglycaemia
Type 2 diabetes
Type 2 diabetes and the heart

Lipids, blood pressure, coagulation, inflammation

Glucose
Type 2 diabetes: Tools

- Glucose lowering agents
- Education and selfmonitoring of blood glucose
- Diet
- Lifestyle
Type 2 diabetes: Tools

• Education
• Diet
• Lifestyle

• Multifactorial approach
  • Glucose lowering agents
  • Selfmonitoring of bloodglucose
‘We live in interesting times’
Current trends
Threshold-Based Insulin-Pump Interruption for Reduction of Hypoglycemia

Richard M. Bergenstal, M.D., David C. Klonoff, M.D., Satish K. Garg, M.D., Bruce W. Bode, M.D., Melissa Meredith, M.D., Robert H. Slover, M.D., Andrew J. Ahmann, M.D., John B. Welsh, M.D., Ph.D., Scott W. Lee, M.D., and Francine R. Kaufman, M.D., for the ASPIRE In-Home Study Group

Figure 2. Primary and Key Secondary End Points.

As shown in Panel A, the mean (±SE) changes in glycated hemoglobin concentrations during the study phase (the primary efficacy end point) were similar in the threshold suspend and control groups (0.01 ± 0.04% vs. −0.04 ± 0.22%; difference, 0.05 percentage points; 95% confidence interval [CI], −0.05 to 0.15). As shown in Panel B, the mean area under the curve (AUC) for nocturnal hypoglycemic events during the study phase (the primary efficacy end point) was 37.6% lower in the threshold suspend group than in the control group (P = 0.001). As shown in Panel C, the percentage of sensor glucose values that were less than 70 mg per deciliter was lower in the threshold suspend group than in the control group, whether during nighttime hours (6.5% vs. 10.8%) or during daytime and nighttime hours combined (5.3% vs. 8.8%). The P value was less than 0.001 for each range in the panel. (See Table S2 in the Supplementary Appendix for the percentages of sensor glucose values in all ranges.) To convert values for glucose to millimoles per liter, multiply by 0.0555.

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Current trends
Data overload...
Unmet needs

A clinician’s point of view = A patient’s point of view
What is urgently needed?

• Understanding of diabetes management
  – Patients become experts—
    • Education tools
      • Calculation tools
  
• Access to diabetes specialists

• Labelling of foods

• Social hurdles

• EDUCATION
"imagine if..."
Short term needs

• Achieving full control:
  – Less fluctuation of glycemia’s:
    • Less hypo’s
    • Less excursions after meals
  – Flat glycemic curves

• Less weight gain!

• No pain:
  – Injecting
  – Measuring blood glucose

Glucose sensitive insulins- no-hypo insulins
Painless glucose values – Continuous values
Short term needs

• Artificial pancreas: Intelligent pumps
  – Feedback
  – Closed loop
• Minipumps
• CHEAP
Long term needs

• Prediction
• Prevention
• Cure

Type 1 diabetes

Cure = Replacement of pancreatic betacell

How are beta-cells destroyed in T1D?

Natural immunomodulators as novel immunotherapies for Type 1 diabetes

www.naimit.eu
Social unmet needs

- Awareness
- Access to endocrinologists
‘We live in interesting times’

Day of Affirmation Speech Robert F. Kennedy South Africa June 6th 1966