Diabetes Care in Renal Disease

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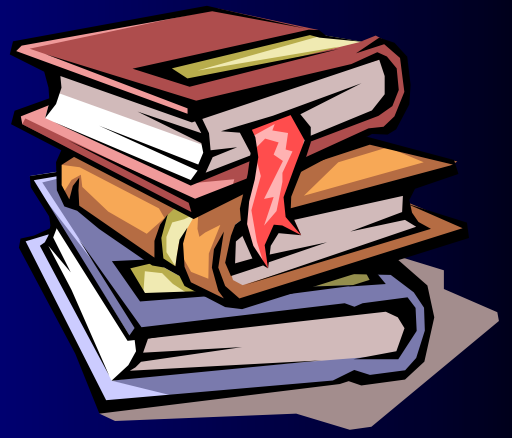
Overview

- **Diabetes/Renal program at the SGH**
- **Diabetes update**
- **Treatment according to GFR**
- **Clinical questions**

Our Program



- Started in 2001
- Diabetes/CKD clinic
- Diabetes/Dialysis clinic
- Volume: 30-40 patients/week
- 2001 4 team members
- 2007 15 team members

Diabetic Nephropathy

- **I Renal hypertrophy**
- **II Histological changes**
- **III Microalbuminuria**
- **IV Proteinuria**
- **V End stage renal disease**

Management

- **Blood sugar control**
- **Blood pressure control**
- **Lipid control**

Classification

- **Type 1**
- **Type 2**
- **Gestational Diabetes**
- **Secondary Diabetes**

Type 1
Pancreatic Failure

- **Auto-immune disease**
- **Beta-cell destruction**
- **Absolute insulin deficiency**
- **Insulin is the only treatment**
- **Transplant**

Insulin in Type 1

- **MDI**

  (Multiple Daily Injections)
- **Insulin Pump**

MDI

- **Basal Insulin**
  - **Lantus**
  - **Levemir**
  - **NPH**
- **Meal Insulin**
  - **Novo rapid**
  - **Humalog**
  - **Toronto/Regular**

Insulin Pump

- **Medtronic pump**
- **Novo rapid or Humalog**
- **Dose calculation**
- **Patient selection**
- **Cost**
- **Coverage**

Type 1 in Renal Disease

- **Use the right insulin**
- **Hypoglycemia**
- **Effect of Dialysis**
  - **PD**
  - **Hemodialysis**
- **Optimize before kidney transplant**
- **Endocrine referral**
- **Pump referral**

Type 2

- **Metabolic disease/syndrome**
- **Insulin Resistance**
- **Relative insulin deficiency**
- **Oral agents**
- **Insulin**

Oral agents

- **Metformin**
- **TZDs (Avandia—Actos)**
- **Secretagogues**
  - **Gluconorm**
  - **Diamicron**
  - **Glyburide**
- **Acarbose**
- **DPP IV inhibitors**

Metformin

- **Inhibits hepatic gluconeogenesis**
- **Improves insulin resistance**
- **GI upset**
- **Lactic Acidosis**
- **GFR >60 OK**
  50-60 Watch
  <50 Stop

TZD
Avandia&Actos

- **Bind to PPAR-gamma**
- **Insulin sensitization**
- **Can be used in kidney disease**
- **Edema**
- **Volume status**
- **CHF**

Gluconorm

- **Insulin secretion**
- **Short acting**
- **Less Hypoglycemia**
- **Can be used in kidney disease**
- **Liver excretion**

Glyburide/Diamicron

- **Insulin secretion**
- **Risk of Hypoglycemia**
- **Renal Excretion**
- **GFR<60 Stop**

Insulin in Type 2

- **Best option in renal disease**
- **Twice/day**
- **Premix Insulin**
  - **30/70**
  - **Novo mix 30**
  - **Humalog mix 25**
  - **Humalog mix 50**
- **MDI**
- **Insulin Pump**

Conclusion

Type 1

- **MDI**
- **Insulin Pump**

Type 2
GFR>60

- **Metformin**
- **Avandia or Actos**
- **Gluconorm/Glyburide/Diamicron**
- **Twice/day Insulin**

Type 2
GFR 50-60

- **Watch closely**
- **If poor control go to insulin**

Type 2 GFR<50

- **If poor control go to Insulin**
- **Avandia or Actos**
  watch volume status
  watch for CHF
- **Gluconorm**

Type 2 Dialysis

- **Insulin**
- **Gluconorm??**
- **Avandia/Actos??**

Transplant

- **Insulin**

Questions