Diabetes & Oral Health

Presented by:
Kris Ferullo RN, BSN, CDE
Denise Bailey RDH

In Collaboration with:
The NH Diabetes Coalition
Division of Public Health Services
Southern NH AHEC
Objectives

- Discuss basic pathophysiology of Diabetes and the importance of Blood Glucose Control to prevent complications.

- State the impact of Diabetes on oral health as well as the effects of poor oral health on diabetes.
Objectives (cont)

- Discuss educating patients with diabetes on the connection between good oral health and glucose control as well as their individual risk factors.

- Demonstrate the use of a communication sheet to keep the primary care provider updated on the oral health of their patients with diabetes.
Basic Pathophysiology

- Normal Glucose Metabolism
- Glucose metabolism in Diabetes
- The role of the liver
The Pancreas
Normal Glucose Metabolism
How Insulin Works

Receptor Site

Insulin Fills Receptor Sites

Insulin Passageways

Glucose

Glucose
Glucose Metabolism in Diabetes
What difference do you see on the left compared to the first slide we looked at?
Insulin Resistance
The Role of the Liver
The 3 Culprits in Type 2 Diabetes

- Not enough insulin
- Insulin resistance
- The Liver
Type 1 or Type 2 Diabetes

- We reviewed Type 2 Diabetes. Type 1 Diabetes is when the body (pancreas) stops making insulin altogether. The pancreas is no longer able to make insulin, so the person has to take insulin to stay alive.

- Is Type 1 the “bad” kind and Type 2 “ok”? No…any Diabetes that is not controlled can lead to complications. That is our goal, to prevent complications. So either Type 1 or Type 2, control is the bottom line.
## Treatment of Diabetes

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin Dependent</td>
<td>Meal Plan &amp; Exercise</td>
</tr>
<tr>
<td>Meal plan and activity important</td>
<td>MP, Exercise &amp; Oral agent/s</td>
</tr>
<tr>
<td>Blood glucose monitoring part of insulin dosing</td>
<td>MP, Exercise, OA, &amp; insulin</td>
</tr>
<tr>
<td>Ketone testing</td>
<td>MP, Exercise, &amp; insulin</td>
</tr>
<tr>
<td></td>
<td>Blood Glucose monitoring</td>
</tr>
<tr>
<td></td>
<td>Ketone testing not necessary.</td>
</tr>
</tbody>
</table>
"The red are for the illness, the blue are for the side effects of the red and the green are for the effects of the blue."
Medications that put the patient at risk for hypoglycemia

- Oral agents: Glipizide, glucotrol, amaryl, glucovance
- Insulin
Hypoglycemia

- What is the definition of hypoglycemia?
- What are the symptoms of hypoglycemia?
- What is the preferred treatment for hypoglycemia?
- Try to find out the cause and help patient learn from episode
Despite the valiant efforts of the research group, the insulin suppository still had one major drawback.
Insulin

- Insulin is a hormone that helps turn food we eat into energy
- NOT the enemy!
- Used in combination to mimic what body naturally does
- May be used with oral agents
Insulin

- Try to mimic what body’s natural insulin does
- Basal (background) insulin inhibits liver’s release of glucose
- Bolus (prandial)
  - Food insulin
  - Correction insulin

Figure 2. Dynamic nature of normal endogenous insulin secretion. Main components are basal insulin and postprandial insulin.
How Much?

- Based on body weight
- Type 2 VERY insulin resistant, large doses of insulin common
- Bolus insulin is adjusted to how much one is eating
Other Insulin Regimes

- **Morning**
- **Afternoon**
- **Evening**
- **Night**

**Nonflexible**

- **REG**
- **NPH/Lente**
- **REG**

**Meals**

- B
- L
- S
- HS
- B

**Insulin Effect**

- **NPH/Lente**
"...I was hoping you'd let me know how much more insulin I need to take if I decide to 'super-size' my order."

© 2004 Diabetes Health
Use of Insulin

- Basal/Bolus preferred
- Monitoring imperative
- Frequent adjustments necessary
- Realistic
- Work with the individual patient
- MANY “wives tales”
Insulin Delivery

- Vial/Syringe
- Insulin pens
- Insulin pumps
Monitoring

- Should be done by ALL people who have diabetes
- Frequency depends on medication/insurance
- Recording is VERY helpful
Target Blood Sugar

- **American Diabetes Association**
  - Fasting 90-130
  - Post meal <180

- **American Academy of Clinical Endocrinologists**
  - Fasting <110
  - Post meal <140
HgbA1c

- Shows average Blood Sugar over 2-3 month period

- Target:
  - ADA <7% (154 mg/dl)
  - AACE <6.5% (140 mg/dl)
“Management experience? Do diabetes and anger count?”

© 2005 Diabetes Health
Diabetes Impact on Oral Health

- Periodontal Disease
- Tooth Decay
- Xerostomia (Dry Mouth)
- Fungal Infections
- Poor Fitting Dentures
- Lichen Planus
Gingivitis = Periodontal Disease
Periodontal Disease

Patients with Diabetes are twice as likely to develop the infection periodontal disease due to uncontrolled blood glucose levels.

The pain and discomfort associated with gum disease can discourage eating, thus affecting blood glucose levels, immune response and wound healing.
Periodontal Disease

Is Considered the 6th Complication of Diabetes

- Retinopathy (eye disease)
- Nephropathy (kidney disease)
- Cardiovascular Disease (heart & brain)
- Neuropathy
- Foot problems
Patients with Diabetes are at a Higher Risk for Root Decay Due to Xerostomia (Dry Mouth)
Xerostomia
(Dry Mouth)

• Symptoms

• Treatments
Fungal Infections

- Symptoms
- Treatments
<table>
<thead>
<tr>
<th>Lichen Planus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause unknown, inflammatory condition</strong></td>
</tr>
<tr>
<td><strong>Treatment is to manage symptoms (itching, burning)</strong></td>
</tr>
<tr>
<td><strong>Appears red lacy bumps on tongue or cheek</strong></td>
</tr>
</tbody>
</table>
POOR ORAL HEALTH = POOR OVERALL HEALTH

- Diabetes increases susceptibility to infection
- Infection in the body complicates blood glucose control. Two hours of hyperglycemia results in impaired WBC function for weeks.
- Increased risk for heart disease
Oral Rinses

- Alcohol Free
- Fluoride
- Chlorhexidine
- Saliva stimulants and replacements
# Oral Hygiene at Home

<table>
<thead>
<tr>
<th><strong>Toothbrushes</strong></th>
<th><strong>Floss</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual vs Electric</td>
<td>Waxed vs Unwaxed</td>
</tr>
<tr>
<td>Soft or extra soft bristles</td>
<td>Interdental cleaners</td>
</tr>
</tbody>
</table>
ILL- Fitting Dentures

A POTENTIAL SOURCE FOR INFECTION
Care for Removable Dentures

- Removing dentures nightly
- Proper cleaning of mouth
- Proper cleaning of dentures
- Anti-fungal medications
- Denture adhesive use
Educate the patient

Motivate the patient to value their health

Communicate with PCP’s
The Team Approach

◆ Disease of self-management—best managed by a team approach
◆ Team members:
  – Patient
  – PCP
  – Diabetes Educator
  – Dietitian
  – Exercise assistance
  – Podiatrist
  – Dental Team
  – Pharmacist
DENTAL – PCP - CDE
Communication Sheet
References

- Journal of Clinical Periodontology, 1994, 11: 221-229
- American Dental Association, 1998, Diabetic Patients
- National Institute of Diabetes and Digestive Diseases and US Dept. of Health and Human services, July 2003, NO 03-4280
- Diabetes and Oral Health, The University of Chicago Medical Center Chicago IL, 2008
References (cont)

- Diane Higgins PharmD, Periodontal Disease in the Diabetic Patient, Pharmacy Times, October 2005
- Diabetic Patients, American Dental Association, 1998
- Prevent Diabetes Problems-Keep Your Teeth Healthy, National Institute of Diabetes and Digestive Diseases and US Dept. of Health and Human Services, July 2003, NO 03-4280