NURS 821 Metabolic and Endocrine Disorders; Alterations in Reproduction

Lecture 9

Part 3 Endocrine Disorders of the Pancreas

Functions of the Pancreas

- Exocrine functions-acini produce pancreatic secretions (amylase, lipase, trypsin)
- Endocrine functions-Islets of Langerhans produce insulin and glucagon

Diabetes Mellitus Incidence

- Diabetes and its complications affect an estimated 16 million Americans
- Leading cause of death and disability in U.S.
- 798,000 diagnosed annually
- One of most common chronic disorders in children
  - 123,000 under 19 have DM
- Annual cost of care is $92 billion-including direct and indirect costs like disability, work loss, and premature morbidity (NIH, 2000)

Diabetes Mellitus

- Definition-Group of metabolic diseases characterized by high b.g. due to altered carbohydrate, fat, and protein metabolism
- Results in macro- and microvascular complications
- Etiology-defects in insulin secretion, insulin action, or both (NIDDK, 2000).

DM in Minorities

- Most significantly affected group-African Americans
- In 1998-of 35 million African Americans, 1.5 million dx c DM
- Around 730,000 undiagnosed
- Every 6 white Americans, every 10 African Americans
- Increased in middle-aged and older and in women
- More likely to experience complications, morbidity, disability, mortality (NIDDK, 2000).

Medical Risk Factors for DM

- Impaired Glucose Tolerance
- Gestational Diabetes
- Hyperinsulinemia and insulin resistance
- Obesity
- Physical Inactivity
- (NIDDK, 2000)

Type I Diabetes

- 5-10% of DM
  - Formerly known as insulin-dependent diabetes or juvenile diabetes
- Any age, more common in whites than non-whites
  - Usually before age 20
  - High rates in northern European countries
- (NIH, 2000).

Type 1 DM

- Etiology-unknown, probably genetic immune dysfunction
- Autoimmune disorder in a genetically prone child probably triggered by a virus
- Immune system attacks beta cells of pancreas, destroying them
- Acute symptoms, although damage may begin years earlier
- (NIDDK, 2000)

Type I Genetic Predisposition

- HLA DW3 and DW4 code for IDDM and for proteins necessary for monocyte-lymphocyte interactions
- These protein defects lead to disordered T cells that destroy islet cells
- Increased anti-islet cell AB
- Triggers in genetically predisposed: coxsackie B4, mumps virus

Type 2 Diabetes

- Most common form-accounting for 90-95%
- Noninsulin-dependent diabetes or adult onset
- Over age 40, most common form over age 55
- 80% are overweight
- Insulin produced but unable to use-insulin resistance
- Manifestations develop insidiously-tiredness, poyuria, nocturia, blurred vision, frequent infections, slow healing. Often diagnosed post event-MI, CVA, PVD (NIDDK, 2000).

Type 2 Diabetes

- Usually adult onset
- Genetic predisposition
- Greatest incidence in non-white populations
- Caused by body's resistance to insulin and impaired secretion (NIDDK, 2000).

Syndrome of Insulin Resistance

- Etiology:
  - Excessive caloric intake leading to obesity
  - Inherited genetic defect (Type II DM)
- Leads to insulin resistance with attempted compensatory hyperinsulinemia:
  - HTN
  - Increased triglycerides, cholesterol, and decreased HDls
  - Complication: ASCVD and sequelae

Type 2 Diabetes

- Related to body's resistance to insulin and impaired ability to secrete insulin
- Can be modified by lifestyle changes
- Disproportionately affects minority subpopulations-African Americans (60% greater), Hispanics (110-120% greater), Native Americans, and Alaska Natives (NIH, 2000).

DM-Acute Symptoms

- Increased Osmotic Load:
- Polyuria
- Polyphagia
- Polydipsia
- Blurred vision
- Cellular Starvation:
- Extreme fatigue
- Weight loss