

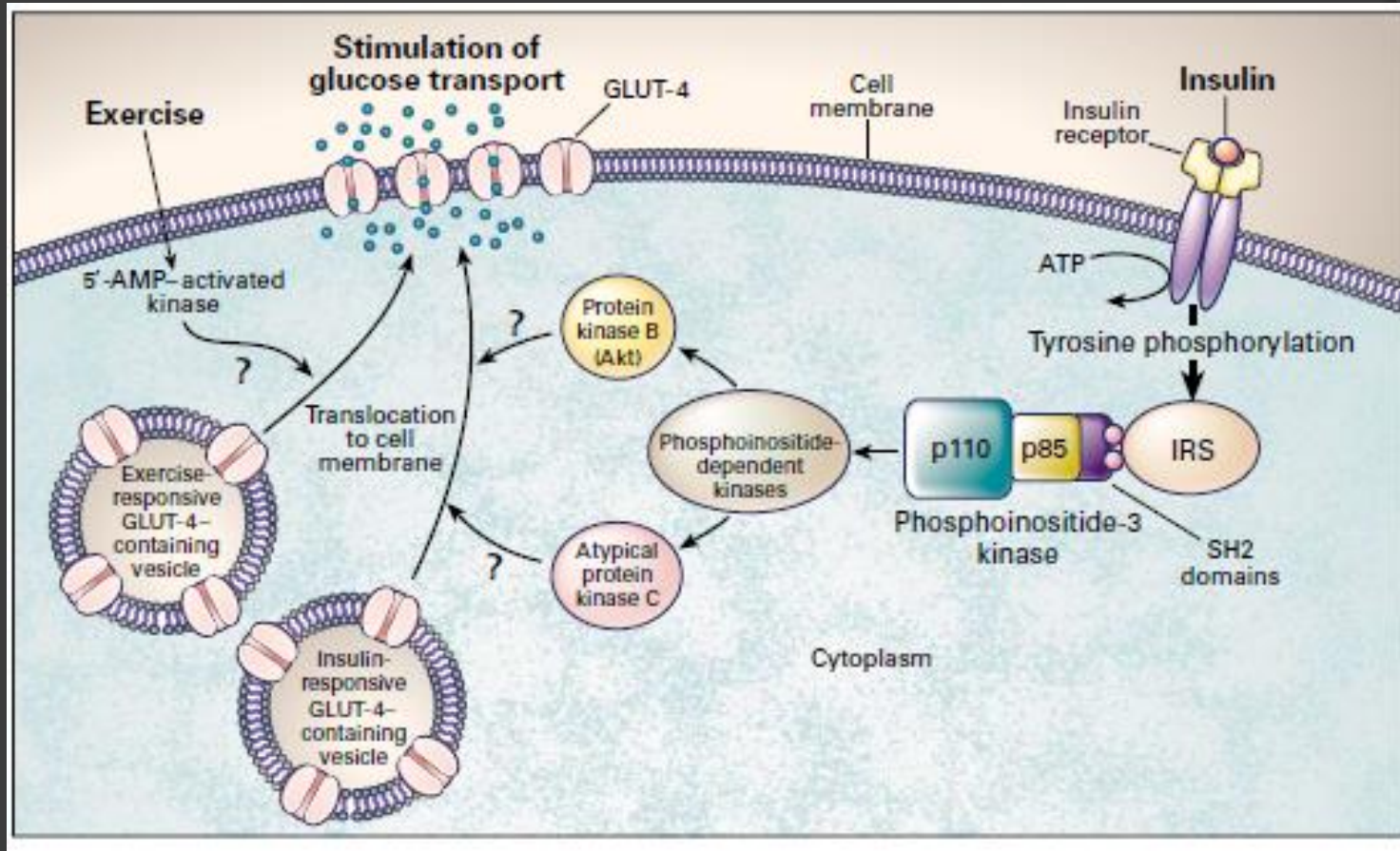
***CHALLENGES OF THE NEW
GLOBALIZATION OF DIABETES:
MANAGING TYPE-II DIABETES MELLITUS AT
SIAYA DISTRICT HOSPITAL, KENYA***

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Outline

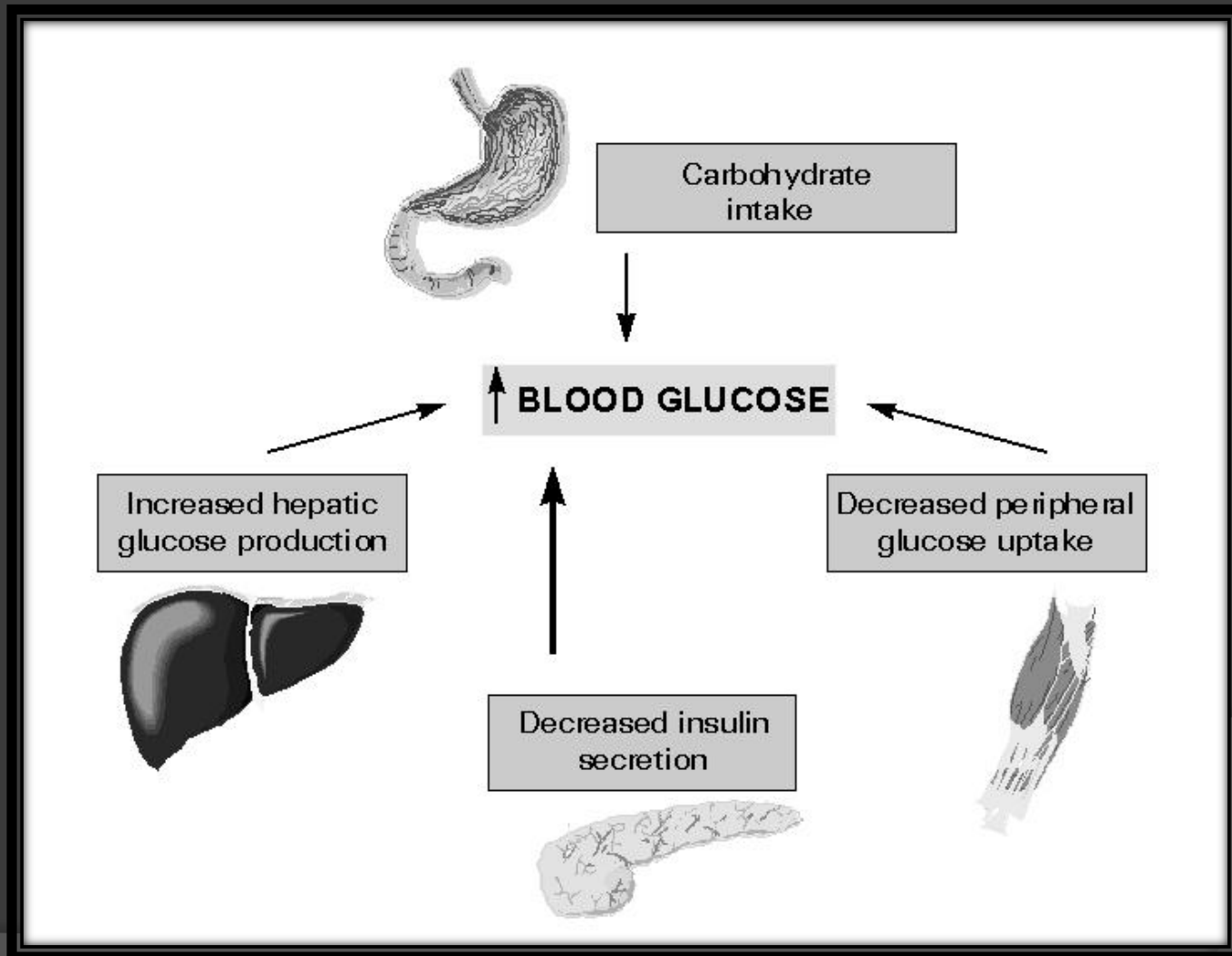
- ⦿ Introduction
 - Diabetes Mellitus, type II
 - Pathophysiology
 - Complications
 - Globalization of DM
- ⦿ Methods
 - Chart review
- ⦿ Results
- ⦿ Discussion
 - Challenges in management
- ⦿ Recommendations

Overview of DM, type -II: pathophysiology



Source: Shepherd, P and Khan, B. "Glucose Transport and Insulin Action: Implications of insulin resistance and diabetes mellitus". The New England Journal of Medicine. Vol 341 No 4(248-257).

Overview of DM, type -II: pathophysiology



Diabetes-associated morbidity and mortality

- *Cardiovascular disease (CHF, hypertension)*
 - Increased 2-4 fold
- *Diabetic retinopathy*
- *End-stage renal disease*
- *Neuropathy and vasculopathy*
 - Leading to nontraumatic lower limb amputations
- **Hearing Loss**
- **Skin Complications**
 - Candidiasis
 - Acanthosis Nigricans
- **Hyperosmolar Hyperglycemic Nonketotic Syndrome (HHNS)**
- **Gastroparesis**
- **Pregnancy outcomes**
 - Fetal macrosomia, hypoglycemia, hypocalcemia, and hyperbilirubinemia

Globalization of Diabetes Mellitus

- In 2012, >371 million diabetics worldwide
- ~4.8 million people died in 2012 due to the complications of diabetes
- In 2012, in sub-Saharan Africa, diabetes is estimated 6 percent of total mortality – an increase from 2.5 percent in 2000.
- Burden of communicable disease

DM, type II and Kenya

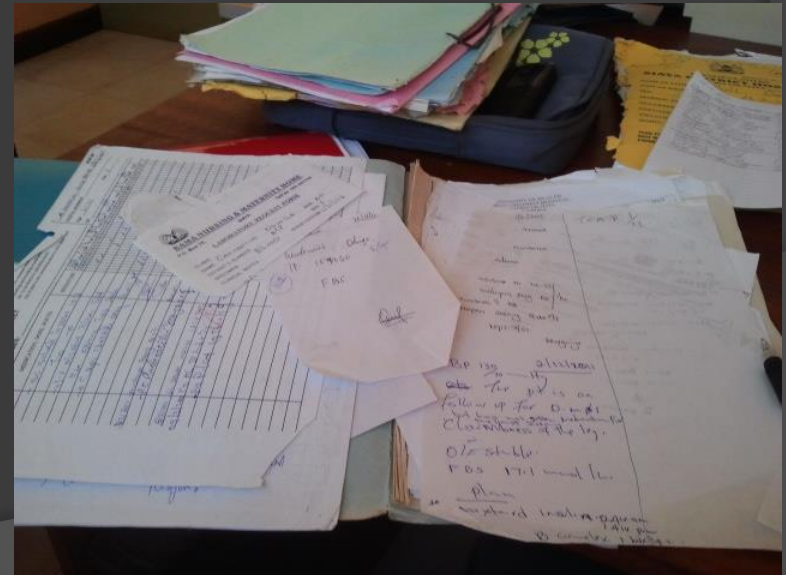
- ◉ The estimated diabetes prevalence in Kenya ranges between 2.7% in rural areas and 10.7% in urban areas
- ◉ Estimated that nearly 600,000 Kenyans have undiagnosed diabetes
- ◉ Rapid urbanization leading to Western lifestyle changes may be a big contributing factor
- ◉ In 2003, non-communicable diseases contributed 53% of hospital admissions in Kenya.

Research Objectives

- ① To evaluate the fasting blood glucose levels and blood pressure readings in relation to age, sex, and mode of management
- ① To evaluate the commonest clinical presentations of diabetic patients at the time of clinic visit
- ① To address the barriers and challenges in managing diabetic patients in Siaya district and similar patient populations
- ① To identify areas for improvement in long-term management of diabetic patients at Siaya District Hospital

Methods

- Chart Review of patients seen at the bimonthly diabetes clinic
 - Pool of 100-200 patients
 - 62 charts reviewed of patients seen between February – April 2013
- Exclusion criteria:
 - Seen only once in clinic
 - No fasting glucose level or blood pressure recorded



Methods

Data Collected

- Age
- Sex
- Date of visit
- Blood pressure
- Fasting blood glucose levels
- Mode of management (insulin, oral medications, diet)
- Presenting symptom at time of clinic visit

Method of Analysis

- Microsoft Excel
- SPSS Statistics, version 19

Methods – Parameters

- ⦿ Fasting Blood Glucose <7.0 mmol/L
- ⦿ Blood pressure < 130/80 mmHg

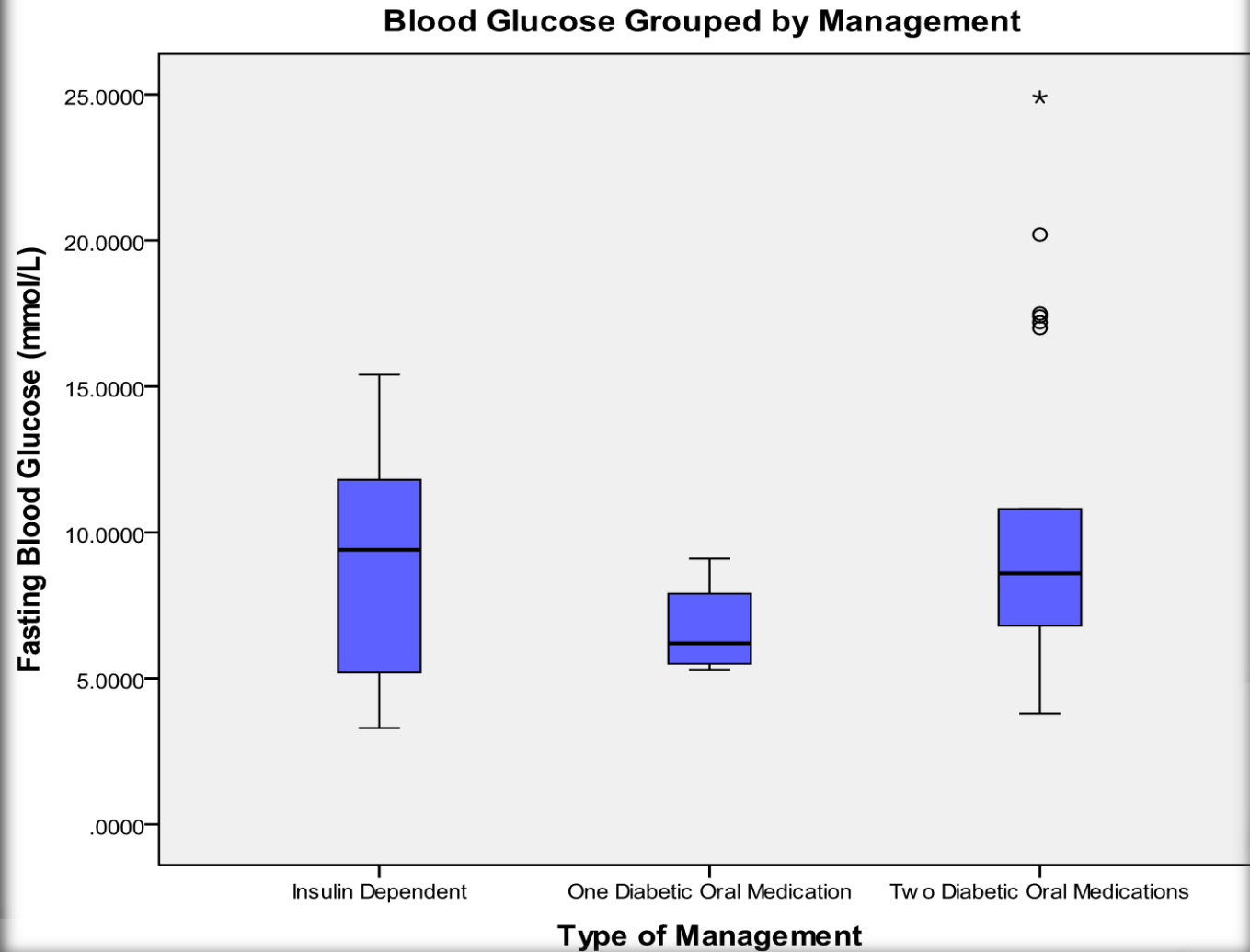
Results

- 39 patient charts analyzed
- 16 (41 percent) male and 23 (59 percent) female
- The mean age was 58.175 years, ranging from 37 to 75 years.

Results – Fasting glucose

- The mean fasting blood glucose level was 9.67 mmol/L, ranging from 3.3 to 24.9 mmol/L.
- In total, 13 out of 39 patients (33.3 percent) had controlled blood glucose levels
- Pearson correlation test revealed that there is no statistical significance in the correlation of age and fasting blood glucose ($p=.106$)

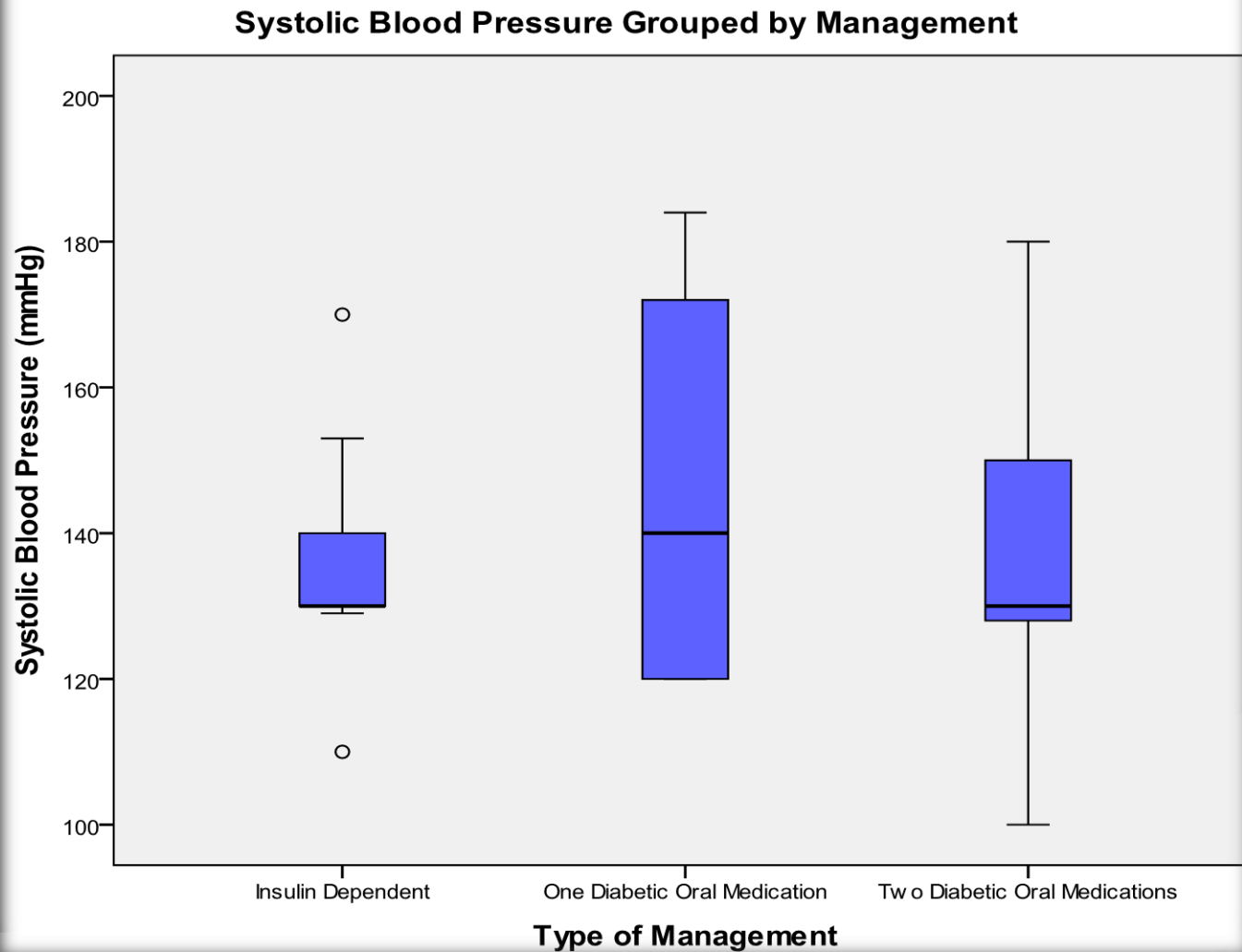
Results – Fasting glucose in Cohorts



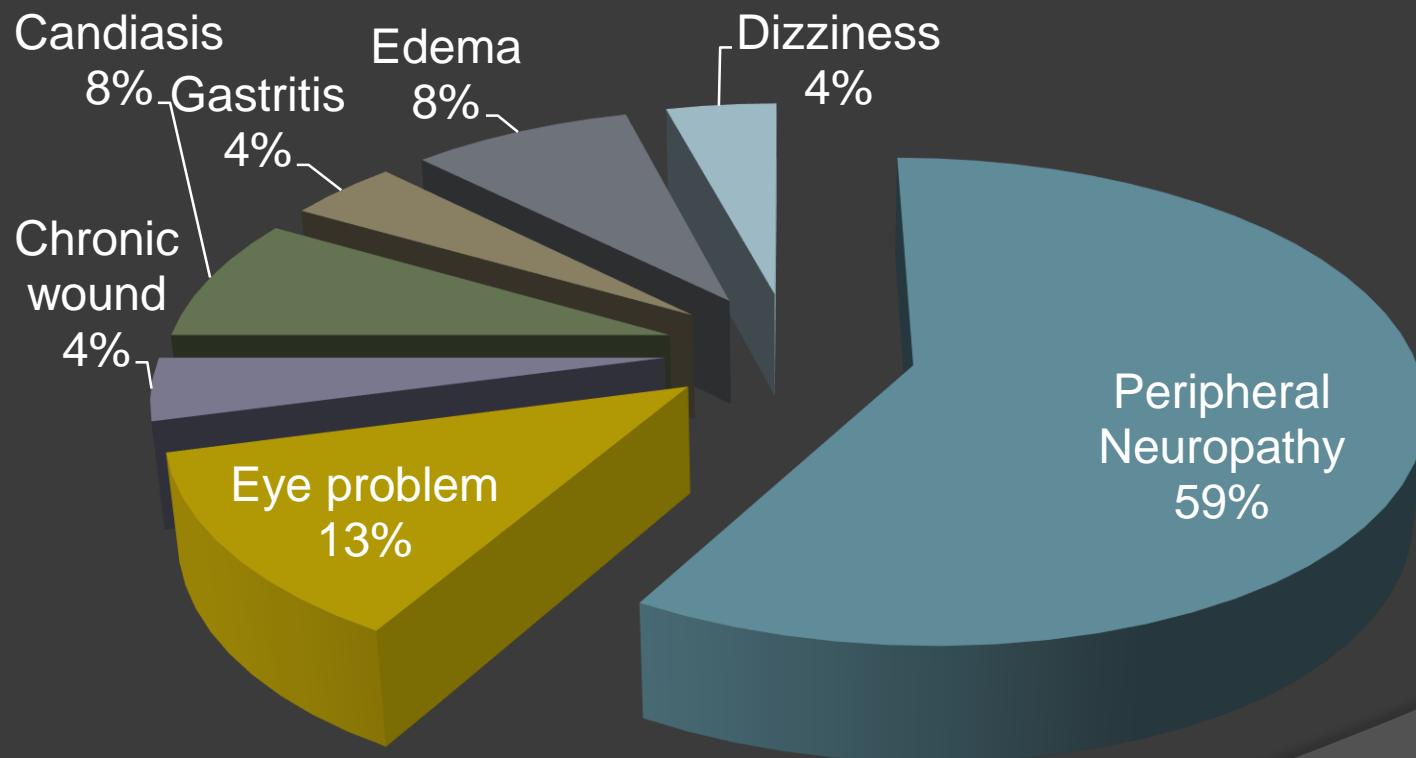
Results – Blood Pressure

- ⦿ The mean blood pressure was 136.7/ 83.9 mmHg
 - Range:100-184 /60 -110 mmHg.
- ⦿ 12 patients (30.7 %) had a tightly controlled systolic blood pressure (<130 mmHg)
- ⦿ Pearson correlation test revealed that there is no statistical significance in the correlation of age and blood pressure (p= .864).

Results – Blood Pressure in Cohorts



Common clinical presentations at time of visit



Glycemic goals and the impact of financial burdens

- Cost of medications (government subsidized)
 - Month supply of metformin, glibenclamide, and enalapril is 180 ksh each
 - A month's supply of insulin is a flat rate of 200 ksh

Glycemic goals and the impact of financial burdens

- ◎ Cost and availability of laboratory test
 - HbA1C
 - Fasting lipid profile, including total, LDL and HDL cholesterol and triglycerides
 - Liver function tests
 - Test for urine albumin excretion
 - Serum creatinine and calculated GFR
- ◎ At home glucometers

ADA Thorough Diabetic Evaluation

Table 7—Components of the comprehensive diabetes evaluation

Medical history

- Age and characteristics of onset of diabetes (e.g., DKA, asymptomatic laboratory finding)
- Eating patterns, physical activity habits, nutritional status, and weight history; growth and development in children and adolescents
- Diabetes education history
- Review of previous treatment regimens and response to therapy (A1C records)
- Current treatment of diabetes, including medications, medication adherence and barriers thereto, meal plan, physical activity patterns, and readiness for behavior change
- Results of glucose monitoring and patient's use of data
- DKA frequency, severity, and cause
- Hypoglycemic episodes
 - Hypoglycemia awareness
 - Any severe hypoglycemia: frequency and cause
- History of diabetes-related complications
 - Microvascular: retinopathy, nephropathy, neuropathy (sensory, including history of foot lesions; autonomic, including sexual dysfunction and gastroparesis)
 - Macrovascular: CHD, cerebrovascular disease, and PAD
 - Other: psychosocial problems*, dental disease*

ADA Thorough Diabetic Evaluation

Physical examination

- Height, weight, BMI
- Blood pressure determination, including orthostatic measurements when indicated
- Fundoscopic examination*
- Thyroid palpation
- Skin examination (for acanthosis nigricans and insulin injection sites)
- Comprehensive foot examination
 - Inspection
 - Palpation of dorsalis pedis and posterior tibial pulses
 - Presence/absence of patellar and Achilles reflexes
 - Determination of proprioception, vibration, and monofilament sensation

Laboratory evaluation

- A1C, if results not available within past 2–3 months

If not performed/available within past year

- Fasting lipid profile, including total, LDL and HDL cholesterol and triglycerides
- Liver function tests
- Test for urine albumin excretion with spot urine albumin-to-creatinine ratio
- Serum creatinine and calculated GFR
- TSH in type 1 diabetes, dyslipidemia or women over age 50 years

Referrals

- Eye care professional for annual dilated eye exam
- Family planning for women of reproductive age
- Registered dietitian for MNT
- DSME
- Dentist for comprehensive periodontal examination
- Mental health professional, if needed

Recommendations

- ◉ Continue patient education and empowerment
- ◉ All healthcare workers, especially community health workers, should be trained to look for risk factors and early signs of glucose tolerance impairment and diabetes
- ◉ Recording weight, BMI, comprehensive foot exam, and fundoscopic exam
- ◉ For patients who can afford advanced laboratory tests, HbA1C, urine microalbumin, serum creatinine should be encouraged
- ◉ Increase referrals to services at Siaya DH (eye clinic, dental clinic, nutritionist)

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