MANAGING GLYCAEMIC CONTROL IN NEPAL

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Impact of Diabetes Mellitus

- Commonest from of diabetes constituting 90% of diabetic population.
- Global prevalence is estimated to increase from 4% in 1995 to 5.4% by the year 2025.
- WHO Prediction – Major burden will occur in developing countries.
  - 42% increase by 2025 in DEVELOPED countries (from 51 to 72 million)
  - 170% increase by 2025 in DEVELOPING countries (from 84 to 228 million)

Impact of Diabetes Mellitus (Cont'd)

- Accounting for 6.8% of all causes of mortality in the age group 20 – 79 years in 2010 (IDF).
- Countries with largest no. of diabetes patient are and will be by 2025 India, China, USA.
- Over 50 million diabetes in South Asia.
- Prevalence much higher in South Asians (about 4 times more than in other ethnic group)

Impact of Diabetes Mellitus (Cont'd)

- South Asian develop diabetes almost 2 decade earlier (majority pts over of 45 – 64 years age; over 65yrs. in developed countries)
- Prevalence of micro and macrovascular complication more in Asians.
- Almost 50% Asians patient have evidence of macro/microvascular complication at diagnosis.

Why T2DM more common in South Asians?

- Genetic & Environmental factors mainly responsible.
- South Asian Phenotype (Asian Indian Phenotype) referring to clinical and biochemical abnormalities contributing to increased predilection to diabetes.
  - Increased Insulin resistance
  - More abdominal & visceral fat for any given BMI.

Why T2DM more common in South Asians? (Cont'd)

- Greater waist circumference and waist to hip ratio "Thin fat Asians"
- Lower adiponectin level.
- High level of leptin, high sensitivity C reactive protein and Non esterified Fatty Acid .

Criteria for the Diagnosis of Diabetes

A1C ≥6.5%

The test should be performed in a laboratory using an NGSP-certified method standardized to the DCCT assay*

Glycaemic Recommendations for Patients with Diabetes

A1C	**<7.0%***
Preprandial capillary plasma glucose	**70–130 mg/dl***
Peak postprandial capillary plasma glucose†	**<180 mg/dl***

Management of Glycaemia

1. Initial Medical Evaluation.
   - Medical History.
   - Review of current treatment plan (if any)
   - Physical Examination including eye exam.
   - Laboratory investigations.
   - Referral if required.
2. Glycaemic goal.
3. Patient Education (Diabetes Self-Management Education)

Management of Glycaemia (Cont'd)

4. Life style changes.
   - Physical activity
   - Diet
5. Pharmacotherapy – Diabetic Management Algorithm.
6. Prevention of diabetic complication.

Initial Evaluation

A complete medical evaluation should be performed to:

- Classify the diabetes
- Detect presence of diabetes complications
- Review previous treatment, glycaemic control in patients with established diabetes
- Assist in formulating a management plan
- Provide a basis for continuing care

Glycaemic Goals

- Lowering A1C to below or around 7%
  - Shown to reduce microvascular and neuropathic complications of diabetes
  - If implemented soon after diagnosis of diabetes, associated with long-term reduction in macrovascular disease

Glycaemic Goals (Cont'd)

- Less stringent A1C goals may be appropriate for patients with:
  - History of severe hypoglycaemia, limited life expectancy, advanced microvascular or macrovascular complications, extensive comorbid conditions
  - Those with longstanding diabetes in whom the general goal is difficult to attain.

Correlation of A1C with Estimated Average Glucose (eAG)

A1C (%)	Mean plasma glucose mg/dl	Mean plasma glucose mmol/l
6	126	7.0
7	154	8.6
8	183	10.2
9	212	11.8
10	240	13.4
11	269	14.9
12	298	16.5

Patient Education

- Diabetes – Primarily a self managed diseases
- Most important aspect of diabetic management
- Almost non-existent in our clinical setting
- Should be an active and concerted effort involving physician, nutritionist, diabetic educator and other health personnel

Patient Education (Cont'd)

- Every Patient should receive Diabetic Self Management Education (DSME)
- Effectiveness of DSME – be measured and monitored
- Individual attention and education preferred

Life Style Modification

- Obesity and lack of physical activities reversible risk factors
- Many studies have shown effectiveness of life style modification
- Weight control, increased physical exercise and smoking cessation potentially beneficial in preventing onset of T2DM and its complications

Life Style Modification (Cont'd)

- Physical Activity – Overweight and obesity are strongly linked to the development of T2DM
- An independent risk factor for hypertension, dyslipidaemia & cardiovascular disease
- Moderate weight loss improves glycaemic control, reduces risk of cardiovascular diseases.

Life Style Modification (Cont'd)

- MNT – Cornerstone of diabetic management, integral component of diabetes prevention, management and self management education
- A dietitian is essential member of diabetic education
- Clinical trial Out Come Studies – MNT decrease A1C in 3 – 6 months period ranging from 0.25 to 2.9%

Pharmacotherapy

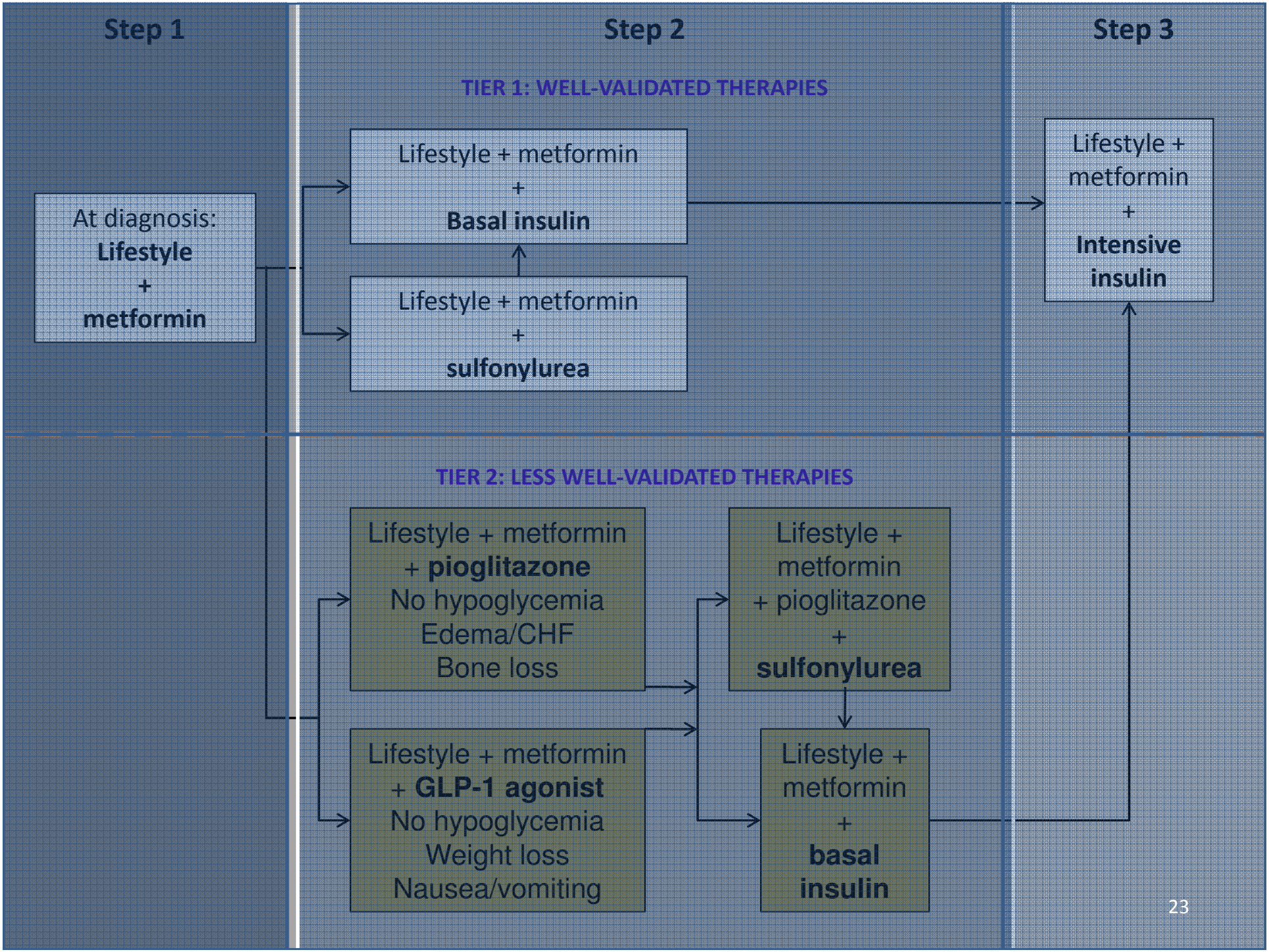
Agents used in diabetes management

1. Sulphonilureas
2. Meglitinides – Ripaglinide, Nateglinide
3. Biguanids – Metfformin
4. Alphaglucosides inhibitor – Acarbose, Miglitol
5. Dipeptidyl Peptidase IV inhibitors (DPP4 inhibitors) Sitaglibtin, Saxagliptin, Linagliptin

Pharmacotherapy (Cont'd)

6. Incretin Mimetics – Exenatide, Liraglutide
7. Insulins
8. Amylin Analogue
9. Bile acid Sequestrant

Diabetes Treatment Algorithms


Step 1
Step 2
Step 3
TIER 1: WELL-VALIDATED THERAPIES
At diagnosis:
Lifestyle
+
metformin
Lifestyle + metformin
+
Basal insulin
Lifestyle + metformin
+
sulfonylurea
Lifestyle +
metformin
+
Intensive
insulin
TIER 2: LESS WELL-VALIDATED THERAPIES
Lifestyle + metformin
+ pioglitazone
No hypoglycemia
Edema/CHF
Bone loss
Lifestyle + metformin
+ GLP-1 agonist
No hypoglycemia
Weight loss
Nausea/vomiting
Lifestyle +
metformin
+ pioglitazone
+
sulfonylurea
Lifestyle +
metformin
+
basal
insulin

PREVENTION AND MANAGEMENT OF DIABETES COMPLICATIONS

Glycaemic, Blood Pressure, Lipid Control

A1C	<7.0%*
Blood pressure	<130/80 mmHg†
Lipids: LDL cholesterol	<100 mg/dl‡

Blood Pressure Control

- Systolic blood pressure <130 mmHg is appropriate for most patients with diabetes

- Patients with diabetes should be treated to a diastolic blood pressure <80 mmHg

- Patients with more severe hypertension (≥140/≥90 mmHg) at diagnosis or follow-up
  - — Should receive pharmacologic therapy in addition to lifestyle therapy

Dyslipidemia Management

- Statin therapy should be added to lifestyle therapy, regardless of baseline lipid levels, for diabetics:
  - with overt CVD
  - without CVD who are >40 years of age and have one or more other CVD risk factors

- In individuals without overt CVD
  - Primary goal is an LDL <100 mg/dl (2.6 mmol/l)

- In individuals with overt CVD
  - Lower LDL goal of <70 mg/dl, using a high dose of a statin is an option

Antiplatelet Agents

- Consider aspirin therapy (75–162 mg/day)
  - As primary prevention in type 1 or type 2 diabetics at increased cardiovascular risk (10-year risk >10%)
  - Includes most men >50 years of age or women >60 years of age who have at least one additional major risk factor
    - Family history of CVD, HTN, Smoking, Dyslipidemia, Albuminuria

Summary

- T2DM epidemic is causing enormous human sufficing & economic cost
- Poorly managed despite of increasing cost involvement
- Patient education is pivotal to management of diabetes
- Long-term micovascular & microvascular complication can be substantially reduced by interventions to achieve glycaemic control

Summary

- A National guideline for management is required
- Initial therapy is with life style modification and Metformin
- Early Insulin therapy for those who do not achieve glycaemic control is mandatory

Thank You