Diabetes in Nepal – Future and Perspectives

S Rajbhandari (UK/Nepal)
Before We Start Think Yourself

• What are the three main diabetes-related problems in your area?
• Which groups are the worst-affected or the most vulnerable in relation to each of these problems?
• What solutions to these problems are already in place?
• From your point of view, what solutions could be implemented? What are your expectations in relation to the management of this disease?
Diabetes prevalence in 2010

- **World**
  - 2000: 151 million
  - 2010: 221 million
  - Increase 46%

- **Africa**
  - 9.4% (14.1 million)

- **Europe**
  - 26.5% (132.3 million)

- **Middle East**
  - 24% (26.5 million)

- **North America**
  - 14.2% (22.5 million)

- **South America**
  - 15.6% (22.5 million)

- **Asia**
  - 84.5% (57%)

- **Oceania**
  - 1.0% (1.0 million)

- **Australia**
  - 1.3% (33%)

The map shows the percentage of the population with diabetes in each region in 2010.
<table>
<thead>
<tr>
<th>Country</th>
<th>2000</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>3,196,000</td>
<td>11,140,000</td>
</tr>
<tr>
<td>Bhutan</td>
<td>35,000</td>
<td>109,000</td>
</tr>
<tr>
<td>India</td>
<td>31,705,000</td>
<td>79,441,000</td>
</tr>
<tr>
<td>Maldives</td>
<td>6,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Nepal</td>
<td>436,000</td>
<td>1,328,000</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>653,000</td>
<td>1,537,000</td>
</tr>
</tbody>
</table>

Wild et al 2004
Prevalence of diabetes in Urban Area in subjects > 40 years (n=1012)

- 30.5% had abnormal GTT
  - known and newly diagnosed 19.0%
  - Impaired 2hr glucose 10.6%
  - Impaired Fasting glycaemia 9.9%, respectively

Of the total population of diabetic individuals 54.4% were undiagnosed

Shrestha Diabet Med 23 (2006)1130
Diabetes in subjects >60 Years

- 1633 subjects underwent FBG in rural & urban area
- Overall prevalence 25.9%
  - 17.3% diagnosed during the survey
  - 8.6% previously diagnosed
- Association with family history, hypertension and physical exercise
- No association with diet

Chhetri Nepal Med Coll J 11 (2009) 34
Risk factors for type 2 diabetes

- Genetic susceptibility
- Increasing age
- Reduced physical activity
- Central obesity
- CV disease & HTN
- Low birth weight
- Medications
Macrovascular disease
- Transient ischaemic attack
- Stroke

Angina
- Myocardial infarction
- Cardiac failure

Microvascular disease
- Diabetic retinopathy
  - non-proliferative
  - proliferative
  - macular oedema

- Microalbuminuria
- Macroalbuminuria
- End-stage renal disease

- Erectile dysfunction

- Autonomic neuropathy

- Peripheral vascular disease

- Peripheral neuropathy
- Osteomyelitis
- Amputation
Death (%) due to diabetes in age 35 – 64
Diabetic subjects die 13 years earlier
Cost of Diabetes

• No economic data available for Nepal
• In India an average person with diabetes spends US $628 in diabetes care every year
  – Cost of admission, consultation, medicines and laboratory testing: $525
  – Cost of loss of earning: $103
• Patient without complications $135
• Patients with 3 or more complications $673

Tharkar DRCP 89 (2010) 334
India to spend $32bn on diabetes care in '10: Study

Kounleya Sinha, TNN, Aug 10, 2010, 04.33am IST

800,000 diabetic people in Nepal

• Almost Half undiagnosed
• Estimated cost to economy 10,000,000,000 NRs (140 million US$) every year
• Those undiagnosed develop complications
• Premature death of adult at the peak of their career

Chhetri 2009 & Shrestha 2006
What is Nepal Government doing?
Health Policy of Government of Nepal

20-year Second Long-Term Health Plan for (1997-2017) identified following 5 priorities:

• CHILD HEALTH

• REPRODUCTIVE HEALTH

• DISEASE CONTROL (Malaria/Kala-azar Filariasis, Encephalitis (JE), Tuberculosis, Leprosy, HIV/AIDS/STIs

• SUPPORTING PROGRAMMES

• FINANCIAL MANAGEMENT

<table>
<thead>
<tr>
<th>Main Interventions*</th>
<th>Health Problems Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Appropriate treatment of common diseases and injuries</td>
<td>Common Diseases and Injuries</td>
</tr>
<tr>
<td>2. Reproductive health</td>
<td>Maternal and Perinatal health problems including other RH issues</td>
</tr>
<tr>
<td>3. The expanded programme on immunisation (EPI) and Hepatitis B Vaccine</td>
<td>Diphtheria, Pertussis, TB, Measles, Polio, Neonatal Tetanus, Hepatitis B</td>
</tr>
<tr>
<td>4. Condom promotion and distribution</td>
<td>STD/HIV, Hepatitis B, Cervical Cancer</td>
</tr>
<tr>
<td>5. Leprosy control</td>
<td>Leprosy</td>
</tr>
<tr>
<td>6. Tuberculosis control</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>7. Integrated Management of Childhood Illness (IMCI)</td>
<td>Diarrhoeal Disease, Acute Respiratory Infection (ARI), Protein Energy Malnutrition (PEM), Measles and Malaria</td>
</tr>
<tr>
<td>8. Nutritional supplementation, enrichment, nutrition education and rehabilitation</td>
<td>PEM, Iodine Deficiency Disorders, Vitamin A Deficiency, Anaemia, Cardiovascular Disease Prevention, Diabetes, Rickets, Perinatal Mortality, Maternal Morbidity, Diarrhoeal Disease, ARI</td>
</tr>
<tr>
<td>9. Prevention and control of blindness</td>
<td>Cataracts, Glaucoma, Pterygium, Refractive Error, and other Preventable Eye Infections</td>
</tr>
<tr>
<td>10. Environmental sanitation</td>
<td>Diarrhoeal Disease, Acute Respiratory Infection, Intestinal Helminthes, Vector Borne Diseases, Malnutrition</td>
</tr>
<tr>
<td>11. School health services</td>
<td>Diarrhoeal Disease, Helminthes, Oral Health, HIV, STDs, Malaria, Eye and Hearing Problems, Substance Abuse, Basic Trauma Care</td>
</tr>
<tr>
<td>12. Vector borne disease control</td>
<td>Malaria, Leishmaniasis, Japanese Encephalitis</td>
</tr>
<tr>
<td>13. Oral health services</td>
<td>Oral Health</td>
</tr>
<tr>
<td>14. Prevention of deafness</td>
<td>Hearing Problems</td>
</tr>
<tr>
<td>15. Substance abuse, including tobacco and alcohol control</td>
<td>Cancers, Chronic Respiratory Disease, Traffic Accidents</td>
</tr>
<tr>
<td>16. Mental health services</td>
<td>Mental Health Problems</td>
</tr>
<tr>
<td>17. Accident prevention and rehabilitation</td>
<td>Post Trauma Disabilities</td>
</tr>
<tr>
<td>19. Occupational health</td>
<td>Chronic Respiratory Disease, Accident, Cancers, Eye and Skin Diseases, Hearing Loss</td>
</tr>
<tr>
<td>8. Nutritional supplementation, enrichment, nutrition education and rehabilitation</td>
<td>PEM, Iodine Deficiency Disorders, Vitamin A Deficiency, Anaemia, <strong>Cardiovascular Disease Prevention</strong>, Diabetes, Rickets, Perinantal Mortality, Maternal Morbidity, Diarrhoeal Disease, ARI</td>
</tr>
</tbody>
</table>
18.5 Insulins & Antidiabetic drugs

- Insulin - injection (soluble) - injection, 40 IU / ml in 10-ml vial,
- Intermediate acting insulin - injection, 40 IU / ml in 10-ml vial,
  (as compound insulin zinc suspension or isophane insuline)
- Metformin - tablet, 500mg
- Glibenclamide - tablet, 2.5mg, 5mg
- Protamine Zinc Insulin – injection - 40 IU / ml (long acting) 100 IU / ml in 10-ml vials
- Complementary list:
  – Glipizide - tablet, 2.5 mg, 5 mg
Local Self Governance Act (LSGA) 1999
Health Systems Decentralization

• Decentralizing local health facilities to local bodies to
  – promote efficiency
  – generate financial resources
  – encourage people’s participants
  – Enhance management capacity.

• 1433 health facilities from 28 districts have been handed over to local bodies

• Encouraging results but political process stuck at the local level which has impeded this
Diabetes clinics

- Bir Hospital
- TU Teaching Hospital
- Patan Hospital
- Ganga Lal Hospital
- Other private hospital
Training needs in Diabetes

- No postgraduate programme
- No diabetes specialist nurses
- No podiatrists
- No diabetes Educators
- Limited number of dietician
President’s Message

It is indeed my pleasure to welcome you, on behalf of the Nepal Diabetes Society, to this newly created website. We are especially happy to launch the on the United Nations World Diabetes Day, 14th November.

There has been a rapid growth in onset of diabetes in Nepal in recent times. Dietary changes, obesity, sedentary life styles, and other environmental factors are contributing to onset of diabetes, as well as one of the leading causes of death and disability in our society.
Current treatment of diabetes

• Centred on Glucose control
• Fasting and 2 hr value measured rather than HbA1c
• HbA1c measurement unreliable
• Annual Review usually not performed
• Lipids, smoking, blood pressure frequently missed
Patient perception of diabetes

• Strong belief about certain types of diet
• Changes doctor frequently
• Takes selective advice
• Frequently misses medications
• Does not link diabetes with macro & microvascular complications
This DVD contains Pranayams, Yog assanas, Acupressure and Home remedies for diabetes. A complete Routine analysis of a diabetic patients, as to what they should eat, the amazing home remedies which one can imbibe in his routine, in order to cure Diabetes. This DVD contains specially designed package of yoga, a natural method of healing, which not only controls but cures diabetes and it’s complications.
The Way Forward
Change Government Health Policy

• Non-communicable disease needs to be featured prominently
• Facilitate prevention programme for diabetes & CV disease
• National Intervention Policy for diabetes at Level 1 which is cost effective
### Level 1 Key cost-effective interventions

**Cost per QALY in US $**

<table>
<thead>
<tr>
<th>Intervention†</th>
<th>South Asia</th>
<th>Feasibility‡</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate glycemic control if HbA$_{1c}$ &gt; 9%</td>
<td>Cost saving</td>
<td>++++</td>
</tr>
<tr>
<td>Blood pressure control if pressure &gt; 160/95 mm Hg</td>
<td>Cost saving</td>
<td>++++</td>
</tr>
<tr>
<td>Foot care in people at high risk of ulcers</td>
<td>Cost saving</td>
<td>++++</td>
</tr>
</tbody>
</table>

Narayan  CMAJ 175 (2006) 736
<table>
<thead>
<tr>
<th>Intervention</th>
<th>South Asia</th>
<th>Feasibility‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preconception care for women of reproductive age</td>
<td>Cost saving</td>
<td>++</td>
</tr>
<tr>
<td>Lifestyle interventions to prevent type 2 diabetes</td>
<td>60</td>
<td>++</td>
</tr>
<tr>
<td>Influenza vaccinations for elderly people with type 2 diabetes</td>
<td>180</td>
<td>++++</td>
</tr>
<tr>
<td>Annual eye examination</td>
<td>350</td>
<td>++</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>730</td>
<td>++</td>
</tr>
<tr>
<td>ACE inhibitor use</td>
<td>510</td>
<td>+++</td>
</tr>
</tbody>
</table>
## Level 3 Key cost-effective interventions

### Cost per QALY in US $

<table>
<thead>
<tr>
<th>Intervention</th>
<th>South Asia</th>
<th>Feasibility†‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metformin therapy to prevent type 2 diabetes</td>
<td>1820</td>
<td>++</td>
</tr>
<tr>
<td>Cholesterol control if total cholesterol level &gt; 200 mg/dL</td>
<td>3680</td>
<td>+++</td>
</tr>
<tr>
<td>Intensive glycemic control (reduce HbA$<em>{1c}$ to &lt; 8%) if HbA$</em>{1c}$ between 8% and 9%</td>
<td>2000</td>
<td>++</td>
</tr>
<tr>
<td>Screening for undiagnosed diabetes</td>
<td>4280</td>
<td>++</td>
</tr>
<tr>
<td>Annual screening for microalbuminuria</td>
<td>2760</td>
<td>++</td>
</tr>
</tbody>
</table>
Other national intervention needed

- Subsidise cheaper treatment of diabetes to prevent complications
- Stricter no smoking policy
- Develop training programme in diabetes at various levels
- Standardise laboratory results with system of accreditation
Standardised Laboratory

- Quality control of all laboratory results
- HbA1c test results should be standardised to worldwide standard
- IFCC reference measurement procedure should be the method for calibrating all assays
- Government should bring method of accreditation of laboratories
Education & Social System

• In the school curriculum
  – Does healthy lifestyle feature?
  – Does smoking prevention feature?
  – Does obesity prevention feature?
  – Is there education about diabetes, hypertension and heart disease?

• Are all these important in social system
Continuing Medical Education
Holistic Treatment of Diabetes

- Education is the key to successful treatment
- Lifestyle modification is most important
- Cheaper drugs should be used
- Physicians should concentrate on other risk factors like BP, Lipids & Smoking in addition to fasting and PP blood sugar
Regular check up

• A = Advise (Smoking, diet & exercise)
• B = Blood Pressure
• C = Cholesterol & creatinine care
• D = Diabetes Control (HbA1c)
• E = Eye care
• F = Foot care
• G = Guardian drugs (statins, ACE, Aspirin)
Patient Held Record

• Most patients will visit a number of doctors and specialists
• Hand held record will help communication
• This will also prompt various tests needed
• Uniform format needed
• Planning to introduce hand held record for distribution to all clinics
**Kathmandu Declaration 2008**

- Life circle approach to prevention and care of DM
- Encourager member state to make local policy for prevention, treatment and care of DM
- UN resolution 61/225 of 2006
Linking with International Partners

- EASD postgraduate course
- Link with ADA/IDF/DSAG
- Collaboration within SAARC country
- Various International Courses & Meetings
- Exchange programmes
Grants for Development / Research

- IDF
- WDF
- WHO
- DFID
- THET
- Bill Gates Foundation
- ADA
- JDRF
- NIHR
- EASD
- UK
Pharmaceutical Industries

• Novo: World Partnership project
• Lilly Foundation
• Roche: Diabetes in Children
• Abbott Fund
• Novartis
Research

- Epidemiology
- Ethnic difference
- Urban & Rural difference
- Different type of diabetes
- Effect of educational intervention at school
- Effect of altitude / hypoxia on various acute and chronic complications
- Effect of deworming in glucose intolerance
In summary

• Government should change health policy to make non-communicable disease a priority
• Prevention should be promoted through education and social intervention
• Holistic treatment of diabetes and its associated conditions
• Know your ABCDEF of diabetes care
• Uniform patient held record needs to be developed
Before We End Think Yourself

• What are the three main diabetes-related problems in your area?
• Which groups are the worst-affected or the most vulnerable in relation to each of these problems?
• What solutions to these problems are already in place?
• From your point of view, what solutions could be implemented? What are your expectations in relation to the management of this disease?