PREVALENCE OF DIABETES, CARE AND PROFILE OF DIABETIC PATIENTS IN NEPAL

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## At a Glance

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total world population (billions)</strong></td>
<td>7.0</td>
<td>8.4</td>
</tr>
<tr>
<td><strong>Adult population (20-79 years, billions)</strong></td>
<td>4.3</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>DIABETES &amp; IGT (20-79 years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Prevalence (%)</td>
<td>6.6</td>
<td>7.8</td>
</tr>
<tr>
<td>Comparative Prevalence (%)</td>
<td>6.4</td>
<td>7.7</td>
</tr>
<tr>
<td>Number of people with Diabetes (millions)</td>
<td>285</td>
<td>438</td>
</tr>
<tr>
<td><strong>IGT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global prevalence (%)</td>
<td>7.9</td>
<td>8.4</td>
</tr>
<tr>
<td>Comparative prevalence (%)</td>
<td>7.8</td>
<td>8.4</td>
</tr>
<tr>
<td>Number of people with IGT (millions)</td>
<td>344</td>
<td>472</td>
</tr>
</tbody>
</table>
No. of people with diabetes (20-79 years), 2010 & 2030

<table>
<thead>
<tr>
<th>Country / Territory</th>
<th>2010 Million</th>
<th>Country / Territory</th>
<th>2010 Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. India</td>
<td>50.8</td>
<td>1. India</td>
<td>87.0</td>
</tr>
<tr>
<td>2. China</td>
<td>43.2</td>
<td>2. China</td>
<td>62.6</td>
</tr>
<tr>
<td>4. Russian Federation</td>
<td>9.6</td>
<td>4. Pakistan</td>
<td>13.8</td>
</tr>
<tr>
<td>5. Brazil</td>
<td>7.6</td>
<td>5. Brazil</td>
<td>12.7</td>
</tr>
<tr>
<td>6. Germany</td>
<td>7.5</td>
<td>6. Indonesia</td>
<td>12.0</td>
</tr>
<tr>
<td>7. Pakistan</td>
<td>7.1</td>
<td>7. Mexico</td>
<td>11.9</td>
</tr>
<tr>
<td>8. Japan</td>
<td>7.1</td>
<td>8. Bangladesh</td>
<td>10.4</td>
</tr>
<tr>
<td>9. Indonesia</td>
<td>7.0</td>
<td>9. Russian Federation</td>
<td>10.3</td>
</tr>
<tr>
<td>10. Mexico</td>
<td>6.8</td>
<td>10. Egypt</td>
<td>8.6</td>
</tr>
</tbody>
</table>
Nepal - a small beautiful Himalayan country, sandwiched between the two giants of Asia, China in the north and India in the south.

- full of majestic hills and mountains, much of the parts are difficult and under-developed terrains without accessible roads.
- more than 80% of the total population live in rural areas.

Population: 24,501,000
Land Area: 147,181 sq km
Capital City: Kathmandu (Largest city)
Proportions of Patients with Diabetes in Medical Wards, Bir Hospital, Kathmandu

- Singh DL, Bhattarai MD, Maskey A. Int Diabetes Digest 1995; 6: 87-8
Prevalence Surveys

- Cluster sampling: significant response
- Sample size
- House to house campaigning
- Response
- Different urban and rural parts in Nepal from 1996 to 2002
- Overnight fasting
- Plasma glucose estimation at the site within 1 hour of blood collection
- Laboratory set up at each site
- Same personnel and method
- Glucose oxidase method
m2

No short-cut to scientific methodology
To do research in plant also no cut short

Took almost 4 to 5 years
mub, 06/06/2009
Prevalence of Diabetes & Impaired Fasting Glycemia (Prediabetes): Urban & Rural Nepal


<table>
<thead>
<tr>
<th>20 to 39 yrs Women</th>
<th>DM</th>
<th>IFG</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>0.9%</td>
<td>0%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Urban</td>
<td>5.4%</td>
<td>5.4%</td>
<td>10.8%</td>
</tr>
</tbody>
</table>
Next Prevalence Survey in Urban Nepal
Age & Sex Standardized Prevalence of Diabetes & Prediabetes: Urban Nepal above 40 years

<table>
<thead>
<tr>
<th>Condition</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes or Pre-diabetes: Glucose intolerance</td>
<td>30.5%</td>
</tr>
<tr>
<td>Diabetes (known and newly diagnosed)</td>
<td>19%</td>
</tr>
<tr>
<td>Prediabetes: Impaired glucose tolerance (IGT)</td>
<td>10.6%</td>
</tr>
<tr>
<td>Prediabetes: Impaired fasting glycaemia (IFG)</td>
<td>9.9%</td>
</tr>
</tbody>
</table>

40 years and above

- Shrestha UK, Singh DL, Bhattarai MD. Diabetic Medicine, 2006, 23; 1130–1135
Prevalence of High BP >140/90 in > 40 years in Urban Nepal

Shrestha UK, Singh DL, Bhattarai MD. Diabetic Medicine, 2006, 23; 1130–1135
Profile of People with Diabetes

• Patients contact different health practitioners and doctors as per their choices and likes

• Many of the diabetic patients do not regularly contact their physicians.

Data Analysis

Total Number of diabetic patients :- 500
Male :- 285 (57%)
Female :- 215 (43%)
Data Analysis

Age

Under 20 = 1 (0.2%)  
Over 21-30 = 6 (1.2%)  
Over 31-40 = 50 (10%)  
Over 41-50 = 139 (27.8%)  
Over 51-60 = 160 (32%)  
Over 61-70 = 93 (18.6%)  
Over 71 = 51 (10.2%)  

More diabetic patients are over the age of 40.
Data Analysis

Occupation

- Housewife = 118 (23.6%)
- Service = 107 (21.4%)
- Business = 92 (18.4%)
- Others = 183 (36.6%)
  (Mostly retired)
Data Analysis

Fasting Blood Sugar
Normal = 82 (16.4%)  Over 111-125 = 50 (10%)
Over 126-140 = 55  (11%) Over 141-249 = 260  (52%)
Over 250 = 53  (10.6%)

Over 126 mg% - 73.6%
Over 141mg% - 62.6%
Data Analysis

HbA1C

Total Test = 259
Normal = 130 (50.2%)
Over 7.0 = 129 (49.8%)
Data Analysis

**Blood Urea**

Total Test = 489
Normal = 439 (89.8%)
Over 45 = 50 (10.2%)
Data Analysis

Blood Serum Creatinine
Total Test = 472
Normal = 452 (95.8%)  
Over 1.4 = 20 (4.2%)
Data Analysis

Micro Albumin
Total Test = 176
Negative = 136 (77.3%)
Positive = 40 (22.7%)
Data Analysis

Total Cholesterol
Total Test = 490
Normal = 427  (87.1%)
Over 250 = 63  (12.9%)
Data Analysis

HDL Cholesterol
Total Test = 490
Normal = 450 (91.8%)
Below 40 mg = 40 (8.2%)
Data Analysis

**LDL Cholesterol**

Total Test = 490
Normal = 400 (81.6%)
Over 100 = 90 (18.4%)
Data Analysis

**Triglyceride**
- Total Test = 490
- Normal = 399 (81.4%)
- Over 150 = 91 (18.6%)
Profile of People with Diabetes

Body Mass Index (BMI) = Weight kg/Ht X Ht meter

<table>
<thead>
<tr>
<th>BMI</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 26</td>
<td>36.4%</td>
</tr>
<tr>
<td>24 to 25</td>
<td>16.8%</td>
</tr>
<tr>
<td>21 to 23</td>
<td>33.2%</td>
</tr>
<tr>
<td>≥ 20</td>
<td>13.6%</td>
</tr>
</tbody>
</table>

Exercise Stress Testing in Non-Smokers Diabetic Patients With Normal Resting ECG & Without Any Symptoms & Signs of HD

### Mean ± SD of weights and BMI of women

<table>
<thead>
<tr>
<th></th>
<th>Before Pregnancy</th>
<th>Six months after delivery</th>
<th>One year after delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight in kg: mean ± SD</td>
<td>51.3 ± 4.9</td>
<td>67.2 ± 6.3</td>
<td>63.4 ± 6.4</td>
</tr>
<tr>
<td>Body Mass index: mean ± SD</td>
<td>21.3 ± 1.8</td>
<td>27.9 ± 2.5</td>
<td>26.7 ± 2.8</td>
</tr>
</tbody>
</table>


➢ The risk to mother or to offspring of the subsequent pregnancy is obvious
The average increase in weight and BMI from basal values before pregnancy

<table>
<thead>
<tr>
<th></th>
<th>↑ after 6 months of delivery</th>
<th>Diff. from basal values</th>
<th>↑ 1 year after delivery</th>
<th>Diff. from basal values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>15.9 kg</td>
<td>P &lt; 0.01</td>
<td>12.1 kg</td>
<td>P &lt; 0.01</td>
</tr>
<tr>
<td>BMI</td>
<td>6.6</td>
<td>P &lt; 0.01</td>
<td>5.4</td>
<td>P &lt; 0.01</td>
</tr>
</tbody>
</table>

- Difficulty in losing weight gained
The different recommended ranges of BMI for normal, overweight and obese

<table>
<thead>
<tr>
<th>BMI</th>
<th>Europid BMI</th>
<th>Asian BMI</th>
<th>Asian Indian BMI Consensus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>18.5 – 24.9</td>
<td>18.5 – 22.9</td>
<td>18 – 22.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25 – 29.9</td>
<td>23 – 24.9</td>
<td>23 – 24.9</td>
</tr>
<tr>
<td>Obese</td>
<td>≥ 30</td>
<td>≥ 25</td>
<td>≥ 25</td>
</tr>
</tbody>
</table>
Unawareness of Asian BMI among doctors.
Bhattarai MD, Singh DL. PG Med J Nep 2007; 7

Abstracts sent to authors of common international books like Harrison, Oxford, Davidson, Kumar Clark, Hutchinson, Macleod etc!: Good responses
Responses from Editors/Authors

• “I will make sure this is in the General Examination chapter of the next (12th) edition of Macleod’s – which we hope will be published in May 2009” -- Graham Douglas

• “I think we can work from that in a few terse sentences” -- Michael Swash MD (Hutchinson clinical med)

• “I accept that we could also make reference to the WPRO guidance in Table 5.23 on the opposite page. We will attend to this at the earliest opportunity” -- Brian R Walker (Davidson)

• “We will consider strategies to make these distinctions even clearer in future editions” - J. Larry Jameson (Harrison)
On analysis of data related to diabetes:

- More common in urban areas as compared to the rural (14.6% vs. 2.5%)
- More diabetes over 40 years of age
- More common in sedentary life style
- Family history – 32%
- More than 50% of diabetes have more than 24 BMI
- BP ↑ around 25%
- Blood sugar not controlled in more than 50%
- Blood urea and creatinine ↑ in 5 – 10%
- Micro albumin positive in about 22%
- Dyslipidemia – about 20%
Factors responsible for increase in prevalence of Diabetes

Social
• Desire for modern westernized lifestyle
• Reduced influence of traditional cultures
• Urbanization

Economical
• Increased international trade in processed food products
• Powerful and effective advertising and marketing of unhealthy products worldwide
• Increases in sedentary jobs

Behavioral
• adopting unhealthy behavior, such as smoking, at a relatively early age
• changes in eating habits towards restaurant, fast foods and meat and dairy products
PROBLEMS IN DEVELOPING COUNTRIES.

• Magnitude of problem
• Manpower resources
• Literacy
• Education programs
• Communication and transport
• Religious beliefs and taboos
• Financial resources
Organisation of Diabetes Care

• Health education of the public
• Guided patient self-care
• Continuous education of patients
• Training of health personnel and lay workers
• Community participation
• Organizing and maintenance of primary diabetes health care supported by Specialist consultations
• Attempts to improve the environment
• Social support
• Development of Diabetes registers or other relevant information systems
• To identify and mobilize all community resources, it is necessary to work closely with official and voluntary organizations.
Conclusion

• Establish diabetes as a priority health concern.
• Develop and implement national strategies and programmers;
• Achieve universal access to a quality care, training, and essential diabetes medications and supplies;
• Encourage strategic alliances with other concerned parties, such as governments, non-governmental agencies, mass media and industry;
• Promote education for people with diabetes, health professionals and the public in the prevention and management of diabetes.
• Integrate diabetes activities with those of other non-communicable diseases;
• Address the problem of discrimination against people with diabetes; and
• Encourage research to advance and apply the knowledge about the effective.