Diabetes and the Elderly

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Challenges of an Ageing Population

Singapore 2012 - 2050

Assuming current birth rates and no immigration from 2013 onwards.
Source: DOS

Source: Singapore Department of Statistics
A Changing Landscape

Baby Boomers have arrived

Who are the baby boomers and why are they important?

THE World Health Organisation defines baby boomers as those born between 1946 and 1964 during the global surge in births in the post-World War II years. Singapore defines it as those between 1947 and 1965. Either way, the baby boomers are all turning around now.

Indeed, the ageing of "boomers" is an epochal moment in the globality of aging, says senior Consultant psychiatrist Koo De Heek from National University Health (NUHS). That's because more of this generation has had so many people growing old at the same time.

There are 10 million baby boomers in Singapore alone - which means that for the next 10 years, about 150 boomers will have their 60th birthdays. The book is a result of his own reflections on the ageing of society and the challenges it brings.

Aging Issue Of Age, based in part on his experiences and those of his high school classmates in the small Malay town of Jota Pahat.

The book is a result of his own reflections on the ageing of society and the challenges it brings. He is worried that too much of the coverage on a greyering world is negative. "We call it the silver tsunami," he points out. "And that's a loaded phrase."

Many still work part-time or full-time; many contribute to the community; they form social networks among themselves for mutual support. The challenge for society is how we leverage their strengths.
Life Expectancy in Singapore
1957-2014

Life Expectancy at 65 years of age:
- Males: 19 years
- Females: 22.2 years

Source: Singapore Department of Statistics
Prevalence of Diabetes
National Health Survey (Singapore)

Age-specific prevalence (%) of diabetes mellitus by gender, 2004

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
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<tbody>
<tr>
<td>18-29</td>
<td>0.2</td>
<td>0.8</td>
<td>0.5</td>
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<tr>
<td>30-39</td>
<td>2.7</td>
<td>2.1</td>
<td>2.4</td>
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<tr>
<td>40-49</td>
<td>9.7</td>
<td>6.0</td>
<td>7.9</td>
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<tr>
<td>50-59</td>
<td>17.6</td>
<td>15.9</td>
<td>16.7</td>
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<tr>
<td>60-69</td>
<td>28.9</td>
<td>28.5</td>
<td>28.7</td>
</tr>
</tbody>
</table>

Source: National Health Survey 2004
Prevalence of Diabetes

National Health Survey (Singapore)

Singaporeans aged 18-69 years

Source: National Health Survey 2004
Prevalence of Diabetes
International Diabetes Federation. 2015.

Prevalence of Diabetes: 12.8%
(20-79yrs)

Singapore
World
The enteroinsular axis

Fig. 2. Model for normal adaptation to insulin resistance. In response to insulin resistance of any cause, β-cell function adapts with compensatory hyperinsulinemia to maintain euglycemia.

Fig. 3. Model for age-related hyperglycemia. Multiple risk factors for type 2 diabetes associated with aging predispose older adults to develop glucose intolerance and increased insulin resistance. However, in elderly humans, β-cell function is impaired, and compensatory hyperinsulinemia does not occur. With further loss of β-cell function, impaired glucose tolerance (IGT) and type 2 diabetes develop.
T2DM is a progressive disease: Do microvascular and macrovascular complications begin at different times?

The Diabetes Journey

Adapted from DeFronzo RA. *Med Clin N Am* 2004;88:787-835.
Faces of Diabetes
At the Geriatric Clinic

- Diabetes
- Macrovascular Complications
- Microvascular Complications
- Cognitive Impairment
- Physical Frailty
- Other Co morbidities
- Tenuous Social & Care setting
Mr Tan
- 88/Chinese/Male (Obese)
- Lives with son’s family and has a maid
- He is BADL assisted and needs a WF for ambulation after 3 falls last year. He is incontinent and has cognitive impairment after 2 strokes
- He is currently on HCTZ 25mg OM, KCL0.6g OM, Ca et Vit D 2 OM, Senna 2 ON, Lactulose 10ml TDS, Enalapril 10mg BD, Amlodipine 5mg OM, Plavix 75mg OM, Simvastatin 20mg OM, Metformin 250mg TDS, Glipizide 10mg BD, ISMN 30mg OM, Gabapentin 300mg ON, Neuroforte 1 TDS
- He has complications of PVD, Peripheral neuropathy as well as renal impairment
- His HbA1c is 8.3% and fasting BGM is 11.2 mmol/L. BP is 168/100mmHg
- He is accompanied by his son who is unsatisfied with the state of DM control

Mr Gopal
- 78/Indian/Male
- Lives alone after wife’s death
- Supportive family but he wants to live independently.
- Fully ambulant and able to take care of himself. He goes for regular jogs by himself.
- Known diabetic for years
- He is currently on Metformin 850mg TDS and Glipizide 15mg BD
- His HbA1c is 8-8.5% over 3 occasions.
- He only has mild evidence of early nephropathy
- He is referred from the OPS to the clinic for optimization of DM control

Mdm Aminah
- 84/Malay/Female
- Lives alone with a maid but is visited by her children regularly. They are very particular about her intake and give very stern instructions to the maid
- She had bilateral BKA and is currently dependent for her BADLs
- She needs Insulin Mixtard(30/70) 20U and 10U BD, Metformin 500 TDS, Enalapril 10mg BD, Simvastatin 20mg ON, Lexapro 10mg ON
- Her HbA1c is 6.5%
- She is currently admitted to the hospital for hypoglycemia.
- The family is wondering why she is hypoglycaemic having been on the same drug for the last 10 years
Burden of Treatment
(& their ability to comply with ease)

Preventing Future DM Complications
(in the backdrop of their life expectancy)

Meaningful goals
(independence)

Preventing Current Metabolic Crisis
(averting hospitalization)

4 Key Considerations
Thank You