

Adherence to Clinical Practice Guidelines in a Specialist Diabetes Care Setting



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Introduction

Diabetes is the 7th leading cause of death in Singapore and a leading contributor to cardiovascular disease, kidney failure, blindness and non-traumatic amputation¹ and affiliated an estimated 8.2% of the adult Singapore population.² Clinical practice guidelines (CPG) for diabetes care include recommendations for type and frequency of various clinical and biochemical parameters.³ However, little is known of the extent of adherence to these guidelines. We sought to ascertain levels of adherence to CPG at a tertiary hospital's diabetes centre in Singapore.

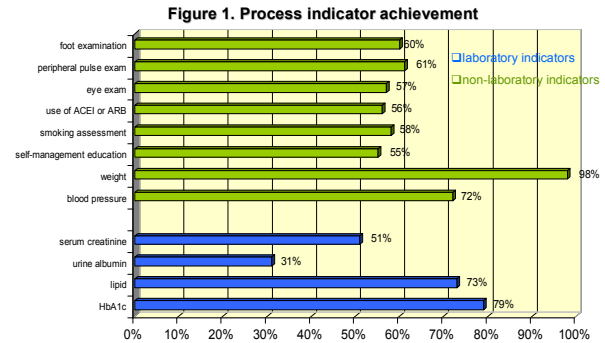
Methods

- A retrospective review of outpatient clinical records on 399 new cases over a 15-month period between April 2006 and August 2007.
- The CPG adherence based on a list of quality indicators for diabetes recommended by Ministry of Health, Singapore and American Diabetes Association were evaluated (table 1).
- Examine the diabetes care measures by age, sex, race, payer class and civil service card status to understand variation of these factors.
- The achievement score using 12 indicators (blood pressure, body weight or BMI, smoking assessment, ECG record, retinal screening, peripheral pulse assessment, foot assessment, patient self-management education, HbA_{1c}, lipid profile, urine albumin/protein test and creatinine) were calculated by giving equal weighted for each indicator (one point = one indicator achievement).

Table 1. Criteria for CPG adherence of process indicators

| Indicators | Criteria (during 15-month period) | |
|------------|--|-----------------------------------|
| LAB | Glycated haemoglobin HbA _{1c} | at least 2 times |
| | Urine albumin/protein | at least once |
| | Serum Creatinine | at least once |
| | Lipid Profile | at least once |
| NON | Blood pressure | at every visit |
| | Body weight or BMI | at least once |
| | ACEI or ARB | prescribed or not treatment |
| | Eye assessment | at least once |
| | ECG record | ever done before |
| | Foot assessment | at least once |
| | Pulse assessment | at least once |
| | Self-management education | at least once |
| | Smoking assessment | at least once |
| | Smoking cessation advice | at least once (where appropriate) |

Level of adherence to CPG ranged from 31% to 98%. Many process variations were found in measurement of process indicators. Figure 1 demonstrates the percentage of achievement for process indicators.



Even though many process variations were found compared to other studies, the achievement of 3 key process indicators (HbA_{1c}, lipid profile and blood pressure) were comparable (Table 3). However, methods of measurement might be different.

Table 3. Comparison of diabetes process indicators to other studies

| Process Indicators | % of indicators achievement | | |
|---|-----------------------------|--------------------------------|--------------------------------------|
| | Study cohort (N=121) | NHG study ⁴ (N=575) | UKNDA ⁵ 05/06 (N=500,000) |
| Glycated Haemoglobin, HbA _{1c} | 79 | 83 | 83 |
| Lipid profile | 73 | 77 | 81 |
| Urine albumin/protein | 31 | 45 | 48 |
| Serum creatinine | 51 | 88 | 83 |
| Blood pressure assessment | 72 | 98* | 86 |
| Smoking assessment | 58 | NA | 79 |
| Smoking cessation advice | 36 | NA | NA |
| Body weight or BMI | 98 | 28 | 81 |
| Eyes assessment | 57 | 40 | 61 |
| ECG record | 7 | NA | NA |
| Peripheral pulse assessment | 61 | NA | NA |
| Foot assessment | 60 | 18 | 64 |
| Self management education | 55 | 37 | NA |
| ACEI or ARB treatment record | 56 | NA | NA |

* Once in 6 month. SDC - Specialist Diabetes Centre, SOC - Specialist Outpatient Clinics (Cardiology, Geriatric, Internal Medicine and others), P&S - primary and specialist care settings

Results

A total of 376 cases were included in initial analysis. Table 2 shows the demographic characteristics of patients in this study. During the study period of 15 months, 121 (32%) cases were followed up for the full 15-month period, 38% were discharged, 26% did not turn up and 3% were given open-date appointments.

Table 2. Demographic characteristics of diabetes patients

| Variables | Full 15-month Follow Up (N=121) | Cohort at start of review period (N = 376) | Total patients seen in the Diabetes centre, 2007 (N=5,953) |
|------------------------------------|---------------------------------|--|--|
| Age (yr) - Mean (SD) | 57.1 ± 13.6 | 57.8 ± 13.4 | 58 ± 14 |
| Male sex - no (%) | 57 (47%) | 193 (51%) | (50%) |
| Race - no (%) | | | |
| Chinese | 73 (61%) | 233 (62%) | (65%) |
| Malay | 16 (13%) | 51 (14%) | (12%) |
| Indian | 16 (13%) | 55 (15%) | (17%) |
| Others | 16 (13%) | 37 (9%) | (6%) |
| Payer Classes - no (%) | | | |
| Subsidized | 77 (64%) | 229 (61%) | (73%) |
| Private | 25 (21%) | 95 (25%) | (24%) |
| Non-resident | 17 (14%) | 43 (11%) | (3%) |
| Civil Service Card Status - no (%) | | | |
| YES | 12 (10%) | 35 (10%) | (13%) |
| NO | 107 (88%) | 332 (88%) | (87%) |

The process indicators were grouped into three categories using convenient scoring as one point for one indicator that adhered to 12 process indicators. 20% of patients had low level of adherence, 39% had medium adherence and 41% had high rank of compliance with process indicators. Level of adherence to CPG was not associated with improved intermediate outcomes such as HbA_{1c}, lipid profile and blood pressure measurements (Table 4).

Table 4. Relationship between level of adherence and process indicators

| Process indicators | Level of adherence to process indicators | | | P-value |
|--|--|-------------------|------------------|---------|
| | Low (1-4) N=24 | Medium (5-8) N=46 | High (9-12) N=49 | |
| HbA _{1c} (%), mean ± standard deviation | 7.9 ± 1.9 | 7.8 ± 1.8 | 7.9 ± 1.8 | 0.96 |
| LDL cholesterol (mmol/l), mean ± SD | 2.9 ± 1.2 | 3.1 ± 1.1 | 2.8 ± 0.9 | 0.37 |
| Systolic Blood pressure (mmHg), mean ± SD | 135 ± 24 | 141 ± 21 | 140 ± 26 | 0.63 |
| Diastolic Blood pressure (mmHg), mean ± SD | 78 ± 13 | 76 ± 11 | 79 ± 13 | 0.49 |

Conclusion

Despite publication of national diabetes guidelines, process and outcome indicators remain widely noncompliant among diabetic patients in the diabetes centre. Adherence to CPG in diabetes care is low but is consistent with other international studies. Our results could help to target the areas of diabetes care that need to be addressed to improve adherence to CPG.

References

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