Project Title

Lifestyle Intervention Counselling in Newly Diagnosed Prediabetes Patients in the Primary Care Setting Leads to Increased Appropriate Follow-up Glycaemic Monitoring

Project Lead and Members

Project lead: Yang Zhi Patrick Ee

Project members: Sze Ern Ng, Choon Yen Jerlin Lee, Nai Moey Judy Goh, Mogilan S/O Mohan, Noelina Delson Cadwising, Zhi Han Teo

Organisation(s) Involved

National Healthcare Group Polyclinics, Yishun Polyclinic

Healthcare Family Group Involved in this Project

Medical, Nursing, Allied Health, Healthcare Administration

Specialty or Discipline (if applicable)

Family Medicine

Project Period

Start date: 1 June 2018

Completed date: 28 February 2021

Aims

The rising burden of diabetes in Singapore necessitates screening in at-risk groups to identify patients with prediabetes – impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). Lifestyle interventions can reduce progression to diabetes, with pharmacotherapy recommended if glycaemic control worsens. 6-monthly glycaemic monitoring is recommended in the 2017 Appropriate Care Guide, but is not routinely performed. This study hypothesised that lifestyle intervention counselling

by Nursing Care Managers in a polyclinic would increase appropriate follow-up glycaemic monitoring in newly diagnosed prediabetes patients.

Background

See poster appended / below

Methods

See poster appended / below

Results

See poster appended / below

Lessons Learnt

As in poster discussion / conclusion

Conclusion

See poster appended / below

Additional Information

This project attained Silver (Category: Singapore Primary Care Research Award (Poster)) at the Singapore Health & Biomedical Congress (SHBC) 2021

Project Category

Applied Research, Quantitative Research, Care & Process Redesign, Quality Improvement, Care Continuum, Primary Care, Chronic Care

Keywords

Lifestyle Intervention, Counselling, Prediabetes

Name and Email of Project Contact Person(s)

Name: Ng Sze Ern

Email: janelle_sze_ern_ng@nhgp.com.sg

PCR-P-02

Lifestyle intervention counselling in newly diagnosed prediabetes patients in the primary care setting leads to increased appropriate follow-up glycaemic monitoring

Y.Z.P. Ee, S.E. Ng, C.Y.J. Lee, N.M.J. Goh, M. Mohan, N.D. Cadwising, Z.H. Teo
National Healthcare Group Polyclinics

Background and Hypothesis

The rising burden of diabetes in Singapore necessitates regular screening in at-risk groups. Patients with elevated fasting venous glucose (FVG) levels (6.1-6.9 mmol/L) undergo an oral glucose tolerance test (OGTT). Prediabetes – elevated glycaemic levels lower than diabetes thresholds – is classified using OGTT as impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). A previous local study showed that 35.1% of patients with IGT progress to diabetes[1], and it is important to retard this progression to reduce complications. Lifestyle interventions can reduce this progression by 36%[2], while pharmacotherapy (e.g. metformin) is recommended for patients whose glycaemic control worsens despite lifestyle intervention[3]. Measuring glycaemic status every 6 months can help determine if pharmacotherapy is required[4], and the 2017[5] and 2021[6] Appropriate Care Guides (ACG) on prediabetes recommend 6-monthly glycaemic monitoring. Care Managers (CM) in NHG Polyclinics are nurses trained to counsel patients on lifestyle interventions. Such counselling is provided for all newly diagnosed diabetic patients, whereas newly diagnosed prediabetes patients often only consult a doctor for management. This study hypothesised that lifestyle intervention counselling by a CM in a polyclinic would increase appropriate follow-up glycaemic monitoring (≤6 months) in newly diagnosed prediabetes patients.

Methods

This study was performed in Yishun Polyclinic over 2 years, involving patients on regular follow-up for chronic medical conditions, with an assigned CM. Patients newly diagnosed following OGTT with IFG (FVG 6.1-6.9 mmol/L, 2-hour glucose <7.8 mmol/L) or IGT (2-hour glucose 7.8-11.0 mmol/L) were included. Patients newly diagnosed with diabetes (FVG ≥7.0 mmol/L or 2-hour glucose ≥11.1 mmol/L) were excluded. The control group (OGTT performed from 1 June 2018 to 11 November 2018) received usual care: consultation with a Family Physician. The intervention group (OGTT performed from 12 November 2018 to 31 July 2020) first underwent counselling on lifestyle interventions by their CM. The primary outcome was the percentage of patients in the control and intervention groups with follow-up glycaemic monitoring performed within 6 months, defined as FVG, glycated haemoglobin (HbA1c), or a repeat OGTT. Baseline demographics were also assessed, including type of prediabetes (IFG or IGT), body mass index (BMI), age and gender.

Results

1439 patients were newly diagnosed with prediabetes (479 control, 960 intervention). There was no significant difference between the groups with regard to type of prediabetes (IFG or IGT), BMI, age and gender (Table 1). The percentage of patients in the control and intervention groups with follow-up glycaemic monitoring performed within 6 months was 55.7% and 64.9% respectively (16.5% increase, p=0.001) (Table 2, Fig 1). Analysis of different patient populations in the study showed that the effect of the intervention was more pronounced and significant in patients with IGT (21.4% increase, p=0.001), BMI ≥23 kg/m^2 (17.4% increase, p=0.001), and ≥60 years old (18.1% increase, p=0.008) (Table 2, Fig 2). It was also larger in female patients (19.0% increase, p=0.012). Patients <60 years old also showed a significant, albeit smaller, improvement (14.9% increase, p=0.032).

Discussion and Conclusion

We found that lifestyle intervention counselling by a CM for newly diagnosed prediabetes patients led to increased appropriate follow-up glycaemic monitoring. This may reflect increased awareness of the importance of regular follow-up monitoring. The effect was most significant in patients with IGT, of higher age, and with higher BMI. These patients may receive more emphasis on the importance of preventing progression to diabetes, leading to more frequent glycaemic monitoring. The updated 2021 ACG[6] reinforced that metformin is especially beneficial in patients with BMI ≥23 kg/m^2 or age <60 years old; our intervention also improved glycaemic monitoring in these specific groups. A limitation was that the control and intervention groups were not monitored simultaneously: although baseline demographics were similar, it is possible that other variables could have affected the results. Also, data on other baseline cardiovascular risk factors (e.g. hypertension, hyperlipidaemia, smoking status) was not available. In conclusion, it is hoped that introducing standardised lifestyle counselling by a CM in the primary care setting can improve glycaemic monitoring in newly diagnosed prediabetes patients, with a view to initiate pharmacotherapy if required, in order to reduce progression to diabetes.

	Control (n=479)	Intervention (n=960)	p
IGT	233 (48.6%)	482 (50.2%)	0.576
BMI (kg/m^2)	27.1 (±5.0)	27.2 (±5.1)	0.694
Age (years)	59.6 (±10.0)	59.1 (±10.6)	0.389
Female	229 (47.8%)	460 (47.9%)	0.969

Table 1. Baseline demographics of the control and intervention groups, displayed as mean (±SD) or number (%).

Primary outcome	Control	Intervention	Relative change	p
Glycaemic test performed within 6 months	**n=479 267 (55.7%)**	**n=960 623 (64.9%)**	**+16.5%**	**0.001**
IFG	n=246 132 (53.7%)	n=478 284 (59.4%)	+10.6%	0.138
IGT	**n=233 135 (57.9%)**	**n=482 339 (70.3%)**	**+21.4%**	**0.001**
BMI <23	n=97 53 (54.6%)	n=177 109 (61.6%)	+12.8%	0.264
BMI ≥23	**n=381 214 (56.2%)**	**n=777 513 (66.0%)**	**+17.4%**	**0.001**
Age <60 years	n=254 138 (54.3%)	n=508 317 (62.4%)	+14.9%	0.032
Age ≥60 years	**n=225 129 (57.3%)**	**n=452 306 (67.7%)**	**+18.1%**	**0.008**
Male	n=250 147 (58.8%)	n=500 336 (67.2%)	+14.3%	0.024
Female	**n=229 120 (52.4%)**	**n=460 287 (62.4%)**	**+19.0%**	**0.012**

Table 2. Primary outcome in the control and intervention groups, as well as the indicated subpopulations.

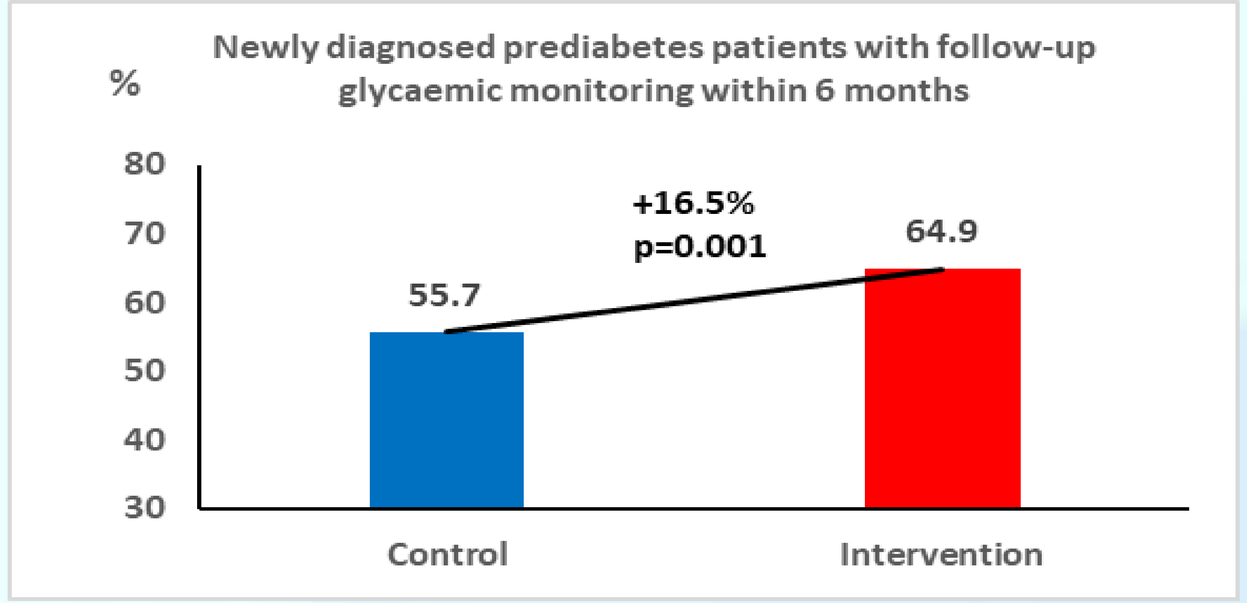

Fig 1. Primary outcome in the control and intervention groups.

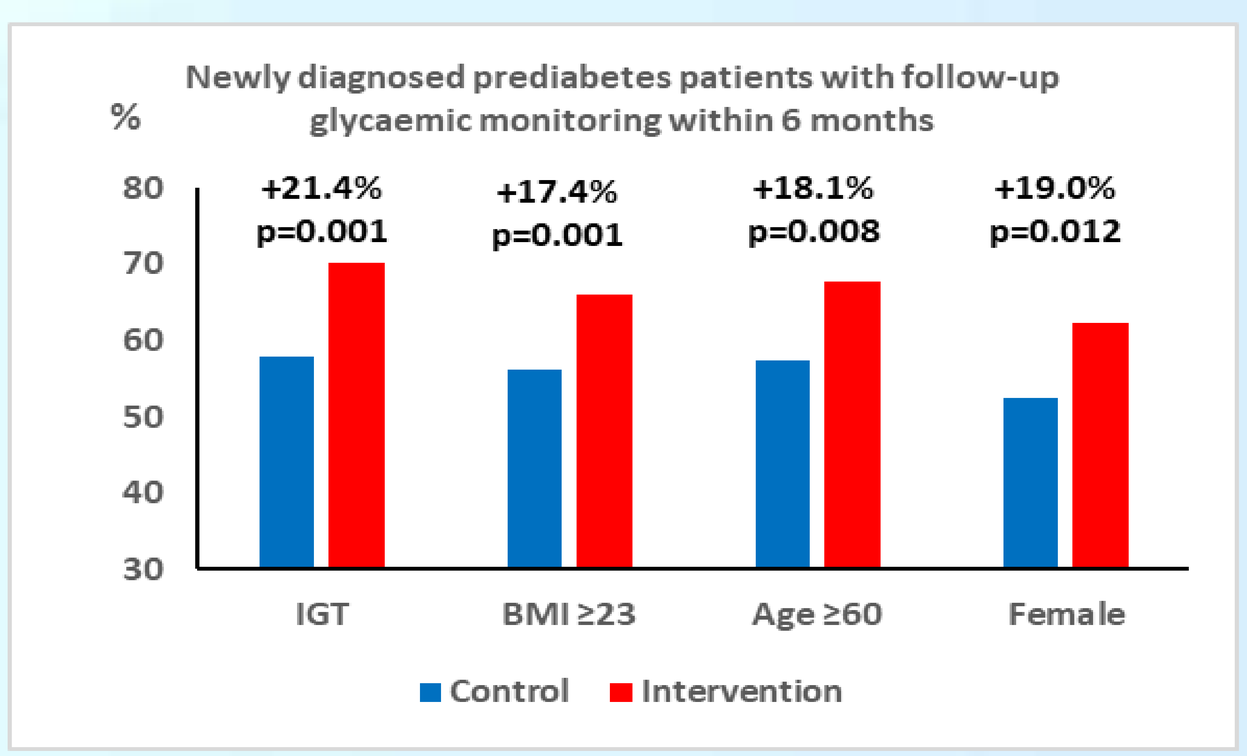

Fig 2. Primary outcome in the indicated subpopulations.

References

1. Wong MS et al, Diabetes Care 2003; 26: 3024-30
2. Barry et al, BMJ 2017; 356: i6538
3. Twigg et al, Med J Aust 2007; 186: 461-5
4. Aroda & Ratner, J Clin Endocrinol Metab 2008; 93: 3259-65
5. Agency for Care Effectiveness, 2017
6. Agency for Care Effectiveness, 2021