Scientific and epidemiological advances over recent decades suggest that subtle disturbances in glucose tolerance at 1-h post-load oral glucose tolerance test (OGTT) may identify people with higher risk of type 2 diabetes mellitus and retinopathy compared with the traditional 2-h post-load glucose level [1]. Even though there is no universal agreement on the threshold of 1-h post-load plasma glucose level, a cut-off point of ≥8.6 mmol/l in those with normal glucose tolerance during an OGTT has been supported by previous studies [2]. However, large-scale population studies to demonstrate the utility of elevated 1-h post-load plasma glucose level have been undertaken mainly in White European and East Asian populations. Little is known regarding the characterization of elevated 1-h post-load plasma glucose level in those with normal glucose tolerance in the Southeast Asian population where the burden of diabetes has been increasing steadily. Thus, we aimed to examine the prevalence of elevated 1-h glucose among normal glucose tolerance participants based on our retrospective cohort of high-risk Thai people who underwent 75-g OGTT during the study period of 2007–2017 at Theptarin Hospital, one of the largest diabetes centres in Thailand.

The data and profiles of participants during the study period have been published previously [3]. Of 512 participants without prior history of diabetes, normal glucose tolerance status was found in 220 (42.9%). Of these participants, 112 (50.9%) had elevated 1-h glucose during an OGTT (defined as 1-h glucose ≥8.6 mmol/l). Table 1 shows the clinical characteristics, laboratory data, Thai diabetes mellitus risk score (Thai DM risk score) and Thai cardiovascular risk score (Thai CV risk score) for the study. The Thai DM risk score is a validated clinical score using age, sex, BMI, waist circumference, hypertension and family history of diabetes.

Table 1 Clinical characteristics, laboratory data, Thai diabetes mellitus risk score (Thai DM risk score) and Thai cardiovascular risk score (Thai CV risk score) of normal glucose tolerance participants with normal and elevated 1-h OGTT

|                  | Normal glucose tolerance (N = 220) | Normal 1-h plasma glucose (n = 108) | Elevated 1-h plasma glucose (n = 112) | P-value |
|------------------|------------------------------------|-------------------------------------|---------------------------------------|---------|
| Female (%)       | 59                                 | 66                                  | 52                                    | 0.036   |
| Age (years)      | 48.4 ± 12.8                        | 46.9 ± 13.6                         | 50.0 ± 11.9                           | 0.073   |
| BMI (kg/m²)      | 26.1 ± 4.7                         | 25.2 ± 4.1                          | 27.0 ± 5.2                            | 0.004   |
| FPG (mmol/l)     | 5.4 ± 0.5                          | 5.3 ± 0.4                           | 5.6 ± 0.5                             | < 0.001 |
| 1-h OGTT (mmol/l)| 9.0 ± 2.3                          | 7.2 ± 1.2                           | 10.7 ± 1.8                            | < 0.001 |
| 2-h OGTT (mmol/l)| 6.2 ± 1.1                          | 5.9 ± 1.0                           | 6.4 ± 1.0                             | < 0.001 |
| HbA₁c (mmol/mol) | 38 ± 2                             | 37 ± 2                              | 39 ± 3                                | 0.003   |
| HbA₁c (%)        | 5.6 ± 0.4                          | 5.5 ± 0.4                           | 5.7 ± 0.5                             | 0.003   |
| Total cholesterol (mmol/l) | 5.1 ± 1.0   | 5.1 ± 0.9                           | 5.2 ± 1.1                             | 0.268   |
| Triglyceride (mmol/l) | 3.3 ± 0.8 | 1.3 ± 0.7                           | 1.6 ± 1.0                             | 0.015   |
| HDL (mmol/l)     | 1.4 ± 0.4                          | 1.5 ± 0.4                           | 1.4 ± 0.4                             | 0.203   |
| LDL (mmol/l)     | 3.2 ± 1.0                          | 3.2 ± 0.9                           | 3.3 ± 1.1                             | 0.594   |
| Visceral fat area (cm²) | 129 ± 41 | 118 ± 37                           | 138 ± 42                             | 0.013   |
| Waist circumference (cm) | 94 ± 13    | 90 ± 9                             | 97 ± 15                              | 0.005   |
| Thai DM risk score | 8.4 ± 3.7 | 7.6 ± 3.7                           | 9.1 ± 3.5                             | 0.002   |
| Thai CV risk score (mean) | 5.5 ± 6.3 | 4.3 ± 5.7                           | 6.7 ± 6.6                             | 0.009   |
| Thai CV risk score (median) | 3 (1–7) | 2 (0–5)                            | 4 (1–9)                              | 0.011   |

OGTT, oral glucose tolerance test; FPG, fasting plasma glucose.
diabetes to predict the future risk of diabetes over 12 years in a Thai population [4]. The Thai CV risk score is a validated risk score to estimate cardiovascular risk over the next 10 years in a Thai population [5]. Compared with a normal glucose tolerance group with 1-h glucose < 8.6 mmol/l, normal glucose tolerance participants with elevated 1-h glucose demonstrated worse metabolic profiles and higher HbA1c levels (39 ± 3 vs. 37 ± 2 mmol/mol, 5.7 ± 0.5% vs. 5.5 ± 0.4%; P = 0.003). Thai DM risk score and Thai CV risk score were also higher in normal glucose tolerance participants with elevated 1-h post-load OGTT.

The prevalence of elevated 1-h post-load plasma glucose (≥ 8.6 mmol/l) in those with normal glucose tolerance varied based on the study design and clinical characteristics of the participants, ranging from 11% to 42% in previous studies [2,6]. In this retrospective cohort of high-risk Thai participants, we found the prevalence of elevated 1-h post-load plasma glucose in a real-life clinical setting to be higher than previous estimations. Therefore, 1-h post-load OGTT in our population could act as a simple test to identify high-risk individuals who remained unidentified by standard OGTT procedure. Elevated 1-h post-load OGTT may also portend future risk for cardiovascular disease. The concept of elevated mid-point OGTT plasma glucose challenges the current classification and diagnostic criteria of pre-diabetes and emphasizes the inferiority of fasting plasma glucose in predicting risk of diabetic complications. OGTT should be done routinely in high-risk patients for early detection of dysglycaemia. Our data were consistent with other studies in White European and East Asian populations which demonstrated that elevated 1-h plasma glucose can identify individuals with normal glucose tolerance at increased risk for type 2 diabetes mellitus and cardiovascular disease [5,7]. Early identification and lifestyle intervention in these high-risk individuals have the potential to delay or prevent the progression to diabetes and also future cardiovascular events.

The discriminative power of the cut-off points to establish the diagnosis of disease has always been a subject of discussion and debate because of the continuous distribution of normal state and disease state. The threshold of 8.6 mmol/l was initially identified in a large cohort of participants without diabetes from the San Antonio Heart Study [6], which showed that this value predicted future risk of type 2 diabetes mellitus over the next 8 years with higher accuracy than in those with impaired glucose tolerance. Our study in a routine clinical setting supported adding 1-h plasma glucose measurement in the routine OGTT procedures. A further prospective study to determine the optimal cut-off value for elevated 1-h OGTT in Thai people should be done to more precisely identify those at risk.

Compelling interests
None declared.

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Recommendations for promoting healthier lifestyles in postpartum women after gestational diabetes

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We read with interest the study by Dennison et al. [1] which provided a qualitative synthesis on the facilitators and barriers to lifestyle changes from the perspective of women