Effects of glycemic variability on short-term outcomes in diabetic patients with unstable angina underperfusion coronary revascularization

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OBJECTIVES Glycometabolic disturbances have been associated with increased mortality in patients with acute coronary syndrome (ACS). However, the predictive value of glycemic variability (GV) for short-term adverse outcome in diabetic patients after percutaneous coronary intervention (PCI) is not clear. The aim of this study is to investigate the diagnostic value of in-hospital GV and hemoglobin A1c (HbA1c) for 3 months major adverse cardiac events (MACE) in diabetic patients with unstable angina (UA) undergoing PCI.

METHODS We studied 459 diabetic patients with UA, whose clinical data including the global registry of acute coronary events (GRACE) risk score, GV and HbA1c were collected before elective percutaneous coronary intervention (PCI). The GV accessed by mean amplitude of glycemic excursions (MAGE) in patients were measured by a continuous glucose monitoring system (CGMS) for 72 hours. The MAGE was calculated by measuring the arithmetic mean of the differences between consecutive peaks and nadirs, provided that the differences are greater than one standard deviation (SD) of the mean glucose value. Patients were categorized according to MAGE level (<3.9 and ≥3.9 mmol/L), based on reference values for continuous glucose monitoring in Chinese subjects, and according to HbA1c level (<6.5% and ≥6.5%). The MACI of patients was documented during 3 months follow-up. During follow-up period, incidences of MACE were registered, including new-onset myocardial infarction, recurrent angina, repeat target vessel revascularization (TVR) after initial revascularization and cardiac death. The relationship of MAGE and incidence of MACE in diabetic patients with UA was analyzed.

RESULTS In all participants, a higher MAGE level or a higher HbA1c level was associated with the higher GRACE score (r = 0.191, p = 0.165, all p < 0.001). The rate of short-term MACE in high MAGE group was higher than in low MAGE group (12.4% vs. 4.8%, p = 0.005), and it is similar between high HbA1c group and low HbA1c group (10.0% vs. 5.8%, p = 0.112). Patients with a higher MAGE level had a significantly higher cardiac mortality during 3 months follow-up (1.8% vs. 0%, p = 0.049). The rates of cardiac mortality, repeat infarction, recurrent angina and TVR in high HbA1c group were similar compared with low HbA1c group (all p > 0.05). Kaplan-Meier survival curve analysis showed the incidence of MACE was significantly higher in the high MAGE level group (log-rank test, p = 0.000). There is a trend toward lower event-free survival rate in high MAGE level patients, but the difference is not significant (log-rank test, p = 0.099). In multivariable analysis, high MAGE level (HR 2.994, 95% CI 1.368-6.579, p = 0.006) was significantly associated with incidence of short-term MACE even after adjusting for GRACE risk score, but HbA1c (HR 1.592, 95% CI 0.708-3.584, p = 0.261) was not.

CONCLUSIONS The in-hospital glycemic variability may be a powerful predictor of increased short-term MACE and mortality in diabetic patients with UA following PCI.

Impact of Gestational Diabetes Mellitus on Pregnant, Obstetric and Neonatal Outcomes: a 10-Year Retrospective Double Cohort Study

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OBJECTIVES Women with gestational diabetes mellitus (GDM) have high rates of pregnancy complications. The aim of this study was to estimate the impact of GDM on pregnant, obstetric and neonatal outcomes, and to evaluate whether the risk of serious perinatal outcomes has changed.

METHODS A retrospective double cohort study (3695 participants in 2001; 7428 in 2010) was performed among women who gave birth in Shanghai First Maternity and Infant Hospital and Shanghai Tenth People’s Hospital between Jan 1th to Dec 31th in 2001 and 2010. Cox regression model was conducted to explore the relationship between GDM and adverse perinatal outcomes.

RESULTS GDM pregnant women had lower values of both body mass index (23.39±3.26kg/m²) and hemoglobin (105.60±13.48g/L) in 2010 than those (25.10±4.00kg/m², 119.20±32.89g/L) in 2001 during their first prenatal visit, with an earlier gestational week of first prenatal visit (16.82±4.62w). Weight gains of GDM women were controlled in normal range, with the timepoint of diagnose to GDM being earlier in 2010 than 2001. As shown in Cox regression models, after adjusted for maternal age, parity, history of spontaneous abortion, history of ectopic pregnancy, unknown stillbirth and death by stillbirth and family history of diabetes, GDM increased the risks of adverse outcomes that included macrosomia, hydramnios, Large for gestational age (LGA), hypertensive disorders complicating pregnancy(HDP) and cesarean delivery in the model of 2001. The risk ratio (RR) and 95% confidence interval (CI) were 5.82(9.32-10.16), 4.48(1.24-16.23), 2.47(1.75-3.48), 2.32(1.01-5.33), 2.15(1.72-2.68), respectively. Adding moderator variable (body mass index,
blood pressure, family history of hypertension) based on 2001 model, GDM increased the risk of adverse outcomes that included neonatal intensive care unit (NICU), macrosomia, HDP, LGA, premature delivery and cesarean delivery in the model of 2010. The value of adjusted RR (95%CI) were: 2.86(1.36-4.48), 2.13 (1.48-3.07), 2.01(1.47-2.46), 1.67 (1.36-2.04), 1.48(1.02-2.25), 1.44 (1.26-1.63), respectively. The incidence of adverse maternal outcomes of GDM subjects in 2010 (78.50%) was less than that (94.68%) in 2001 (X2=13.22, P<0.01).

CONCLUSIONS GDM had a close relationship with adverse perinatal outcomes in both 2001 and 2010. The rank of above outcomes had change in different regions, with the higher the subtotal effect was. The pooled effect in 3 years subgroup was the highest with WMD (95% CI) -0.24 mmol/L (-0.34,-0.14). When participants were divided into two groups according to age, individuals within 40-55 years was included into younger subgroup and all others were assigned to elderly subgroup. No significant subgroup pooled effects were found in younger subgroup (Z=1.65, P=0.05). However, in elderly subgroup, there was a significant effect(Z=10.31, P<0.05). In the two groups, the subtotal effects were -0.27(-0.60,0.05) and -0.19(-0.22,-0.15), respectively. As different regions, significant heterogeneity existed among studies conducted in America and China, but not in Europe (I2=47.00%). The subtotal effect was varied indifferently. The studies conducted among the European population displayed a higher subtotal effect and its WMD was -0.22, its 95% CI was (-0.27,-0.17).

CONCLUSIONS These results indicated both exercise-only and exercise-diet intervention have displayed effect on decreasing the fasting plasma glucose, with a better results in later group. The pooled effect was more significant in longer intervention period, elderly age group and European group.

GW26-e1839
Efficacy of exercise-only versus exercise-diet in the prevention of type 2 diabetes among pre-diabetic population: A meta-analysis
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OBJECTIVES Exercise is considered a protective factor in the prevention of type 2 diabetes (T2D), though its role as a sole treatment for pre-diabetes remains unknown. The present meta-analysis compares the effect of exercise-only to exercise-diet interventions on plasma glucose levels among a pre-diabetic population.

METHODS A literature search using PUBMED, EMBASE and COCHRANE databases yielded 12 studies for analysis. Cochrane Collaborations tool and the Jadad scale were used to assess the quality of the included articles. A random effects model was used to calculate the pooled effect. Weighted mean difference (WMD) was calculated to indicate the change of fast glucose level. Meta-regression was undertaken to explore the impact of risk of bias for the included studies and the forest plot was conducted to explore the relationship between interventions.

RESULTS A total of 4,021 subjects were included in the analysis, 2,045 of them in the intervention group and 1,976 in the control group. Compared to the exercise-only interventions, the exercise-diet interventions showed a significant effect on decreasing fasting plasma glucose (Z=12.06, P<0.05). The subgroup effect of exercise-only interventions did not produce a statistically significant result (Z=1.91, P>0.05), however, it still revealed a significantly decrease in fasting plasma glucose(WMD=−0.19, 95%CI=−0.18,0.00). According to four different intervention periods, the shortest period intervention (less than 1year) did not display a significant effect for glucose control (Z=1.35, P>0.05). and its WMD (95% CI) was -0.12 mmol/L (-0.20,0.05). There was a significant effect (Z=7.19, P<0.05) in 1-year subgroup. The longer the intervention period was, the higher the subtotal effect was. The pooled effect in ≥3 years subgroup was the highest with WMD(95% CI)=−0.24 mmol/L (-0.22,0.15). When participants were divided into two groups according to age, individuals within 40-55 years was included into younger subgroup and all others were assigned to elderly subgroup. No significant subgroup pooled effects were found in younger subgroup (Z=1.65, P=0.05). However, in elderly subgroup, there was a significant effect(Z=10.31, P<0.05). In the two groups, the subtotal effects were -0.27(-0.60,0.05) and -0.19(-0.22,-0.15), respectively. As different regions, significant heterogeneity existed among studies conducted in America and China, but not in Europe (I2=47.00%). The subtotal effect was varied indifferently. The studies conducted among the European population displayed a higher subtotal effect and its WMD was -0.22, its 95% CI was (-0.27,-0.17).

CONCLUSIONS These results indicated both exercise-only and exercise-diet intervention have displayed effect on decreasing the fasting plasma glucose, with a better results in later group. The pooled effect was more significant in longer intervention period, elderly age group and European group.

GW26-e2225
Changes in incidence and risk factors of gestational diabetes mellitus among pregnant women in Shanghai: a comparative study between year 2001 and 2010
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OBJECTIVES To determine the incidences of gestational diabetes mellitus (GDM) in Shanghai in two time points (2001 and 2010) respectively, and to further evaluate whether or not these risk factors of GDM have changed over time.

GW26-e4793
Comparative efficacy and acceptability of glycemic control of glucagon-like peptide-1 receptor agonists for type 2 diabetes: a systematic review and network meta-analysis
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OBJECTIVES The systematic review was to assess the comparative effects of GLP-1 RAs on glycemic control, hypoglycemia and treatment discontinuation for treating type 2 diabetes.

METHODS We searched MEDLINE, EMBASE, the Cochrane library, and www.clinicaltrials.gov from inception to June 1, 2014. Randomized controlled trials comparing a GLP-1 RA with placebo, active anti-diabetic drugs, or other kinds of GLP-1 RAs for type 2 diabetes were included. We only considered the doses of GLP-1 RAs used in routine clinical practice. Eligible trials should have available data on the outcomes of HbA1c <7%, hypoglycemia or treatment discontinuation, with the follow-up of at least 8 weeks. The revised JADAD scale was used to assess risk of bias of the included studies. Network meta-analysis using multivariate model with multi-arm trials adjusted was conducted. We applied loop-specific approach to test the assumption of consistency. Ranking of treatment effects was based on probability shown by the surface under the cumulative ranking curve.

RESULTS From a total of 1139 retrieved records, 78 eligible trials with 34,685 patients were included. 13 different treatments compared in the network included daily exenatide, weekly exenatide, liraglutide, dulaglutide, albiglutide, taspoglutide, lixisenatide, sitagliptin, insulin, thiazolidinedione, sulphanylureas, metformin, and Placebo. The mean and standard deviation of JADAD scores was 5.60 and 1.36, indicating overall low risk of bias of the trials. No serious problem on hypoglycemia and treatment discontinuation, suggesting overall consistent.

CONCLUSIONS GLP-1 RAs may have similar efficacy of lowering HbA1c to traditional anti-diabetes treatments and probably induce less hypoglycemia and higher treatment discontinuation. Insufficient number of trials in some pairwise comparisons may produce inconsistent and uncertainty of the results, which require further robust evidence from well-designed trials.

GW26-e2225
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OBJECTIVES To determine the incidences of gestational diabetes mellitus (GDM) in Shanghai in two time points (2001 and 2010) respectively, and to further evaluate whether or not these risk factors of GDM have changed over time.