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PREVENTION AND RISK REDUCTION

Effect of restoring normoglycemia and modification of metabolic risk factors on type 2 diabetes risk reduction in prediabetic individuals; An individual-level meta-analysis

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Abstract

Aim

To evaluate the reduction in diabetes incidence among individuals with prediabetes who achieve normoglycemia and to assess the role of metabolic risk factor modifications.

Method

An individual-level meta-analysis was conducted using prospective cohort data from America, Australia, and Asia. Participants with prediabetes at baseline were categorised into normoglycemia restoration and persistent prediabetes groups based on glucose status at the first follow-up. Diabetes occurrence was assessed using hierarchical mixed-effect proportional hazards Weibull models, adjusting for age, sex, and metabolic risk factors.

Results

Individuals with prediabetes who achieved normoglycemia had a 51% reduction in diabetes risk compared to those with persistent prediabetes. A negative family history of diabetes reduced the risk of diabetes by 28% (HR 0.72, 95% CI 0.63–0.80). When comparing normal weight with overweight and obesity, the risk of diabetes was reduced by 25% (0.75 [0.64–0.86]) and 36% (0.64 [0.53–0.75]), respectively. A normal waist-to-height ratio reduced the risk of diabetes by 29% (0.71 [0.57–0.81]), and a normal waist-to-hip ratio reduced the risk by 31% (0.69 [0.57–0.81]). A normal level of HDL-C decreased the risk of diabetes by 20% (0.80 [0.70–0.90]). We also observed a greater reduction in diabetes risk when normoglycemia restoration was combined with risk factor modification.

Conclusion

Restoring normoglycemia and modifying metabolic risk factors in prediabetic individuals substantially reduces diabetes risk.

Impact

The findings highlight the clinical and public health importance of targeted interventions during the prediabetes stage to mitigate the future burden of diabetes.

Cortical bone parameters are lower in perimenopausal compared to premenopausal women

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Postmenopausal bone mineral density loss has been well described. There are fewer studies examining changes in alternative bone measures following the onset of menopause. This study examined differences between pre- and perimenopausal women using peripheral quantitative computed tomography (pQCT), which provides information about bone structure. Women (n=66) participating in the most recent follow-up phase of the Geelong Osteoporosis Study were included. Menopause data were self-reported. A pQCT instrument (XCT 2000, Stratec Medizintechnik) was used to obtain standard transverse scans at 4% and 66% of the radial (arm) and tibial (leg) length. Percentage differences comparing the perimenopausal (1-5yr since last menstrual period, n=28) to the premenopausal group (n=38) were calculated. Compared to the premenopausal group (median age 45.3yr, IQR 40.0-47.4yr), women in the perimenopausal (median age 53.5yr, IQR 50.0-57.7yr) group had lower values for cortical bone density at both the radius (4% site: -11.0% 95%CI -18.0%,-5.9%; 66% site: -2.8% 95%CI -4.4%,-1.5%) and tibia (4% site: -3.6% 95%CI -10.2%,-1.1%; 66% site: -2.3% 95%CI -3.6%,-0.3%). Total density was also lower at the radius (4% site: -11.0% 95%CI -17.5%,-4.8%; 66% site: -7.5% 95%CI -10.7%,-0.9%). Cortical area at the 66% tibial site (-7.0% 95%CI -12.0%,-0.3%) and bone mineral content at the radial 4% site (-10.0% 95%CI -14.4%,-2.2%) were also lower for perimenopausal women. Differences in bone parameters, particularly reduced cortical bone, were observed between pre- and perimenopausal women. These data describe changes in bone during perimenopause and aid in understanding the increase in risk of sustaining a fracture in the postmenopausal period.

Polyphenol intake and depressive symptoms in young adults: Evidence from a population-based longitudinal study

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Background: Implementing prevention strategies for depression in young adults is crucial. Emerging research suggests an association between dietary polyphenol intake and depressive outcomes. However, this association has not been assessed in young adults. Objective: The aim of this study was to assess the association between the intake of total polyphenols, polyphenol classes, and polyphenol subclasses, and depressive symptoms in young adults. Methods: Data from the Raine Study Generation 2 participants at 20-, 22-, and 27-years follow-up (N = 1,484; 52.7% female; age range: 18-28 years) were used. Polyphenol intake was estimated from self-reported dietary data using the Phenol-Explorer Database. We categorised energy-adjusted polyphenol intake into quartiles by using the distribution of the dataset. Self-reported depressive symptoms were assessed via the 21-item Depression, Anxiety, and Stress Scale. We fitted unadjusted and adjusted linear mixed-effects models, with sociodemographic characteristics, and lifestyle- and health-related behaviours as covariates. Results: Participants in the highest quartiles for flavonol and hydroxybenzoic acid intake had lower depressive symptoms than participants in the lowest quartiles [flavonols (Q4 v Q1 model-adjusted mean difference: -1.31, 95%CI; -2.46, -0.17); hydroxybenzoic acids (Q4 v Q1: -1.37, CI: -2.48, -0.26)]. We found little to no evidence of an association with depressive symptoms across quartiles for total polyphenols or all other polyphenol classes and subclasses. Conclusions: Higher dietary intakes of flavonols and hydroxybenzoic acids were associated with lower depressive symptoms across time. Future studies are required to investigate whether increasing polyphenol intake could protect against depression in young adults.

Destination micro-elimination: Hepatitis C point-of-care testing uptake in Barwon South West

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Increased hepatitis C testing is required to achieve elimination targets, and simplifying diagnosis is key. Barwon South West (BSW), in regional Victoria, is aiming for hepatitis C elimination. This study aims to assess the care cascade of a hepatitis C RNA point-of-care test (POCT) and incentive program. A viral hepatitis outreach nurse visits primary care services to provide testing, treatment, and support. Hepatitis C RNA POCT was offered to people who inject drugs and had not had a complete test event (hepatitis C RNA or negative antibody test) in the previous six months. Venepuncture for treatment work-up was associated with a $20 incentive. Preliminary findings of the care cascade are presented. Since August 2023, five sites have been recruited. 97 people received POCT; 75/96 (78%) reported injecting in the last six months, and 49/94 (52%) reported prior hepatitis C treatment. 7/94 (7%) reported no prior test - four were people who inject currently. For 18 people, it was their first test to follow up prior treatment; 15/18 were cured (range 5 - 488 weeks post-treatment), 3/18 were not (range 4 - 7 years post-treatment). 13/96 (14%) people had RNA detected, indicating current infection. 5/13 (38%) had not had a complete test event previously. To date, 9/13 (69%) have commenced treatment. POCT identified an RNA prevalence of 14% - of whom 38% had not had a complete test event previously. These data underscore the need to screen and rescreen individuals at risk of infection and link them to care in order to achieve elimination.

Real-life Effect of Statins Therapy on Cancer Incidence in Healthy Older Adults: Evidence from Emulating a Target Trial

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The lack of long-term large-scale RCTs and the issue of confounding factors and other biases in observational studies underscore the need for rigorous research methods. Therefore, this study emulated a target trial to provide robust evidence on the effects of statin therapy, based on its lipophilicity, on cancer incidence. Methods: ASPREE was a randomized trial of 19,114 older adults free of CVD, dementia, and disability. We developed the protocol of two-arm (statin vs no statin) and three-arm (lipophilic, hydrophilic, and no statin) randomized pragmatic clinical trials and then emulated it using the ASPREE cohort data. Both ITT and PP analysis were conducted to estimate the effects of statin therapy on overall and type-specific cancer incidence. Results: Of 18,332 participants, 8,754 initiated statins (5,905 at baseline), with 5,657 lipophilic (4,091 at baseline) and 3,097 hydrophilic (1,814 at baseline). After a median follow-up of 8.3 years, cancer incidence was 49.66 in the statin and 64.31 per 1000PY no-statin group. Statins were found to reduce the risk of total (ITT HR: 0.78[95% CI 0.72, 0.85]), and nonmetastatic (0.77[0.69, 0.86]). However, subgroup analysis revealed statin increases cancer risk (2.43[1.92, 3.06]) in diabetes patients while reducing the risk in non-diabetes. No significantly increased risks for myopathies were found. Implications: Statins reduce the risk of overall, nonmetastatic, and other type-specific cancer regardless of their lipophilicity without increasing risks for severe adverse effects. Importantly, however, statin increases cancer risk in diabetic patients while reducing it in non-diabetes.

Individual and combined effects of gait speed, grip strength, and depression on the risk of serious falls among older adults

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Abstract

Background: The risk of serious falls increases with declining physical function and the presence of depression. We aimed to determine the individual and combined effects of these factors on the risk of serious falls in later life.

Methods: The ASPirin in Reducing Events in the Elderly (ASPREE) trial and ASPREE-Fracture sub-study, which collected comprehensive data on serious falls from Australian community-dwelling older adults (>75 years) were used in this study. The Cox proportional hazards regression model was employed to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) to investigate the combined impacts of gait speed, grip strength, and depression at baseline on the occurrence of first serious falls.

Results: Of 16,357 participants, 1,505 (9.2%) had experienced serious falls with an incidence density of 21.3/1000 person-years with a 95% CI (20.3-22.4). Slow gait, weak grip, and depression at baseline were independently associated with the risk of serious falls (model-adjusted HR = 1.39, 95%CI: 1.23-1.57; HR = 1.22, 95%CI: 1.08-1.38, and HR = 1.29, 95%CI: 1.10-1.50, respectively) and when combined were associated with 2.18 times increased in the risk (HR = 2.18, 95%CI: 1.58-3.02). Combined slow gait and weak grip were associated with a 68% increase in the risk of serious falls (HR = 1.68, 95%CI: 1.41-2.00). Using anti-depressants and sedatives attenuates the effect of depression on the risk of serious falls (HR = 0.98, 95%CI: 0.71-1.35) and (HR = 0.84, 95%CI: 0.51-1.39) respectively.

Conclusion: Gait speed, grip strength, and depression are important predictors for identifying and managing patients at a higher risk of falls. These markers are particularly beneficial when assessed in combination.

Keywords: Serious fall; gait speed; grip strength; depression

Preliminary findings from the Global burden of disease Lifestyle And mental Disorders (GLAD) Project

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Background Data from the Global Burden of Disease (GBD) are often used to determine how much disease burden could be eliminated by targeting specific risk factors. Despite evidence linking diet to common mental disorders (CMDs), the GBD does not currently estimate the contribution of dietary risks to CMDs. The Global burden of disease Lifestyle And mental Disorder (GLAD) Project aims to provide the GBD with data to generate these estimates. Methods In collaboration with the GBD, we created a harmonised data analysis protocol and identified global epidemiological studies with dietary intake and CMDs. Each study (n=20 included to date) will estimate the association of 16 GBD-defined dietary variables with depression and anxiety. Upon completion, the IMPACT-based GLAD Team will meta-analyse the evidence for diet and CMDs, providing results for integration into the GBD framework. Results To date, four studies have completed their analyses. Dietary intake was associated with CMDs; for example, higher wholegrain intake was associated with lower odds of depression (United States (US) cross-sectional study) and risk of depression (English longitudinal study). Conversely, higher sugar-sweetened beverage intake was associated with higher odds (US) and risk (England) of depression. Conclusion and Impact Preliminary results from the GLAD Project provide necessary evidence to the GBD that their 16 dietary risk factors are associated with CMDs. This will enable the GBD to integrate dietary risks for CMDs and evaluate the potential reduction in CMD burden by targeting poor diet, informing public health policy decisions and priorities at the regional and global level.

Identifying Lifestyle Factors, Body Composition and Comorbidities as Key Determinants for Lowering the Risk of Arthroplasty in Weight-Bearing Joints

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Background: Arthroplasty is an orthopaedic surgical procedure to restore the function of a damaged joint. This study aimed to investigate the role of body composition and lifestyle as key determinants associated with a lower risk for arthroplasty. Methods: Longitudinal data from men and women in the Geelong Osteoporosis Study were linked with the Barwon Centre for Orthopaedic Research and Education (BCORE) registry (n=3033, 20-94 years) to identify those with joint replacement surgery (JRS) at the knee or hip. Body mass index (BMI; kg/m2) was determine from weight and height measurements. Bone mineral density (BMD) and height-adjusted appendicular lean mass (ALM/h2) were determined from whole-body scans (Lunar-densitometer). Fracture history, lifestyle factors and comorbidities were self-reported. Participants with JRS prior to baseline were excluded, leaving 2923 participants. Cox regression with age as the time axis was used to follow participants from baseline until JRS, death, migration or study end (31/12/2022). Forward stepwise regression using the R statistical package confirmed significant predictors. Results: JRSs were identified for 143 (4.9%) participants. The model indicates these risk factors for JRS: female sex (HR 2.30, 95%CI 1.38-3.83), sedentary lifestyle (1.35, 0.95-1.92), low spine BMD (3.53 1.57-7.94), low ALM/h2 (1.19, 0.98-1.44), fracture (1.28, 0.91-1.79) and smoking (1.31, 0.93-1.85). Conclusion: Spinal abnormalities in osteoarthritis likely explains the association between high BMD and risk for JRS. Being active, fracture-free, a non-smoker and maintaining greater ALM are protective against arthroplasty. Impact: These strategies have potential to maintain joint function and ultimately reduce the need for surgical intervention.