SUN-622

Background Previous meta-analyses have reported an increase in the risk of hip fractures in diabetes, but the risk of non-vertebral fractures has not been investigated. In addition, it is not known how the risk of fractures is affected by age, body mass index, diabetes duration and insulin use. To investigate these features, we conducted a meta-analysis on the risk of hip and non-vertebral fractures in diabetes. MethodsWe selected a previously published review to be updated. Medline, Embase and Cochrane databases were searched in March 2018 and an update conducted in March 2019 (Pubmed) using relevant MeSH and free text terms such as "diabetes", "hyperglycaemia" and "fracture". We selected observational studies with data on the risk of fractures in adults ολδερ τηαν 18 years old with diabetes compared to people without diabetes. Study quality was assessed using the Newcastle Ottawa Scale. We used the random-effects model to calculate the risk estimates and 95% confidence intervals.Results Forty-nine studies were included. Forty-three studies were included in the hip fracture analysis, 40 cohorts and 3 case-control studies, reporting data from 17,575,873 participants, 2,387,899 with diabetes and 321,720 fractures. Eighteen studies reported the risk of fractures in two or more sites and were included in the non-vertebral fracture risk analysis. All but one study were cohorts. These studies reported data from 2,982,622 participants, 414,195 with diabetes and 185,363 fractures. In both analyses, age varies from 20 to 100 years old, including both type 1 and type 2 diabetes. Overall, the study quality was judged to be moderate to good.We found a significant increase in the risk of fracture in diabetes both for hip (RR 1.52, 95% CI 1.42-1.63) and for non-vertebral fracture (RR 1.20, 1.14-1.27). The increase in the risk was greater for insulin users and longer duration of diabetes, at both sites. At the hip, the risk was higher in the younger population, women, and those with T1D. ConclusionThere was an increase in the risk of hip and non-vertebral fractures in diabetes. Although the mechanisms are not established, patients with type 1 diabetes were the population at higher relative risk. The evidence suggest that the skeleton should be considered a site for diabetic complications.

Reproductive Endocrinology

MALE REPRODUCTIVE HEALTH - FROM HORMONES TO GAMETES

Free Testosterone and Cardiometabolic Parameters in Adult Men - Comparison of Algorithms for Calculation of Serum Free Testosterone

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SAT-045

Context. Determining the free or bioavailable testosterone level has gained increasing interest over the years and different indirect algorithms have been suggested.

Objective. To compare commonly used algorithms of calculation of serum free testosterone, specifically free androgen index (FAI), free testosterone estimated using the Vermeulen algorithm (cFTV) and the Zakharov algorithm (cFTZ) as well as total testosterone in relation to baseline and long-term cardiometabolic conditions.

Design. A prospective cohort study of men participating in four independent population-based surveys (MONICA I-III and Inter99) from 1982 to 2001 and followed until December 2012 with baseline and follow-up information on cardiometabolic parameters.

Setting and Participants. 5350 randomly selected men from the general population aged 30, 40, 50, 60, or 70 years at baseline participated.

Main Outcome Measures. Baseline cardiometabolic parameters and follow-up information on type 2 diabetes, ischemic heart disease, cardiovascular disease mortality, and all-cause mortality.

Results. Free testosterone levels calculated according to the two algorithms differed systematically but however correlated well (cFTV vs. cFTZ: r=0.9, p<0.01) and the relative standard deviations ranged from 37% to 41%. In general, men having cardiometabolic conditions at baseline had lower absolute levels of FAI, cFTV and cFTZ. However, when age-standardizing the hormone levels, FAI levels were higher in this group of men whereas cFTV and cFTZ remained lower compared to men without these conditions. The associations seen for cFTV and cFTZ were in line with the association seen for total testosterone. Cox proportional hazard models revealed that men in the highest quartiles of cFTV or cFTZ had lower risk of developing type 2 diabetes (cFTV: HR=0.74 (0.49-1.10), cFTZ: HR=0.59 (0.39-0.91)) than men in the lowest quartile. In contrast, men with highest levels of FAI had a 74% increased risk of developing type 2 diabetes compared to men in the lowest quartile (HR=1.74, 95% CI:1.17-2.59). In relation to all-cause mortality, FAI showed the strongest inverse association followed by cFTV, whereas cFTZ and total testosterone did not show any association.

Conclusion. Free testosterone estimated by the Vermeulen and Zakharov algorithms differed systematically. However, the computed values correlated well and showed similar associations to baseline and long-term cardiometabolic parameters; albeit with subtle differences. In contrast, an empiric ratio, FAI showed opposite associations to several of the examined parameters and may reflect limited clinical utility.

Genetics and Development (including Gene Regulation)

ENDOCRINE DISRUPTING CHEMICALS

Effects of Organohalogenated Endocrine Disrupting Chemicals on Cell Proliferation and Gene Expression in GH3 Somatolactotropes

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