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75 The effect of inhaled corticosteroids on the risk of diabetes mellitus, prediabetes and glucose regulation in adults with asthma (ICSD Study)

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Introduction: We investigated the risk of long-term inhaled corticosteroids (ICS) on diabetes mellitus (DM), prediabetes, and glucose tolerance in Chinese adult asthmatics in a population-based matched-controlled study.

Methods: A total of 691 asthmatics, aged ≥35 to 74 years, who used ICS regularly for ≥6 months were recruited from four asthma clinics in Hong Kong, excluding those with exacerbation in recent 4 weeks or had taken systemic steroid (SS) in recent 6 months. Each asthmatic was matched 1:1 on age, gender, and body mass index (BMI) with controls from the Hong Kong Cardiovascular Risk Factors Prevalence Study II based on a random population sample. All subjects underwent a 75-g oral glucose tolerance test. The lifetime cumulative budesonide dipropionate equivalent dose of ICS and numbers of SS prescriptions were ascertained. Cumulative median ICS dose was used as the cut-off for high-dose (>2000 mg) and low-dose (1-2000 mg) ICS. DM and prediabetes were defined by American Diabetes Association criteria. The risk of ICS and its dose-response association on DM and prediabetes were evaluated with multivariate regressions adjusting for potential confounders including lifetime SS prescriptions and asthma severity factors. In otherwise healthy ICS users and controls (those without physician-diagnosed cardiometabolic diseases), the dose association of ICS on glucose tolerance and insulin resistance (HOMA-IR) were also studied.

Results: The mean age was 52.8±10.4 years and mean BMI was 23.7±3.7 with 41% males. The median (interquartile range) dose of ICS, duration of ICS use, and numbers of SS prescriptions were 2226 (991-3983) mg, 9 (5-13) years, and 4 (1-11) respectively. ICS users had a significantly lower risk for DM (adjusted OR=0.41, 95% CI: 0.28-0.59), with significant protective associations present in both low-dose (adjusted OR=0.45, 95% CI: 0.22-0.91) and high-dose ICS groups (adjusted OR=0.38, 95% CI: 0.17-0.86); Likewise for prediabetes (adjusted OR=0.35, 95% CI: 0.27-0.47), protective associations were seen in both low-dose (adjusted OR=0.40, 95% CI: 0.28-0.57) and high-dose ICS groups (adjusted OR=0.32, 95% CI: 0.22-0.45). Otherwise healthy ICS users had significantly lower HOMA-IR (adjusted mean difference, -0.20; P<0.001) and better glucose tolerance than healthy controls.

Conclusions: Adults asthmatics on long-term ICS show better glucose metabolic profile than controls from the general population.

76 Association of inhaled corticosteroids with insulin resistance, adiponectin and high-sensitivity C reactive protein in adults with asthma

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Introduction: Adiponectin and high-sensitivity C reactive protein (hs-CRP) are inflammatory biomarkers that have been shown to predict the development of diabetes mellitus (DM) and prediabetes, with high levels of adiponectin associated with reduced risk. In our study on the effect of inhaled corticosteroids (ICS) on glucose metabolism (ICSD Study), we showed that long-term ICS use is associated with reduced risk of DM and prediabetes in adults with stable asthma. In this study, we investigated the association of ICS on these predictive biomarkers in otherwise healthy asthmatics (without physician-diagnosed cardiometabolic diseases) who were long-term ICS users.

Methods: A total of 285 otherwise healthy asthmatics, aged ≥35-74 years, who used ICS regularly for ≥6 months were recruited from four asthma clinics from the territory of Hong Kong. We excluded those with exacerbation in recent 4 weeks or had taken systemic steroid (SS) in recent 6 months. Each asthmatic was matched 1:1 on age, gender and body mass index (BMI) with healthy controls from the Hong Kong Cardiovascular Risk Factors Prevalence Study II. All subjects had normal glucose tolerance on a 75-g oral glucose tolerance test. The lifetime cumulative budesonide dipropionate equivalent dose of ICS and numbers of SS prescriptions were ascertained. Cumulative median ICS dose was used as the cut-off for high-dose (>2000 mg) and low-dose (1-2000 mg) ICS. The dose associations of ICS with insulin resistance (HOMA-IR), adiponectin, and hs-CRP were evaluated with multivariate regressions adjusting for potential confounders including lifetime SS prescriptions and asthma severity variables.

Results: The mean age was 48±9.4 years, and mean BMI was 22.7±3.3 with 36% males. The median (interquartile range) dose of ICS, duration of ICS use, and the total dose of SS prescriptions were 2192 (848-3894) mg, 9 (5-13) years, and 4 (1-11.5) respectively. Long-term ICS use was significantly associated with a lower HOMA-IR for both low-dose (adjusted mean difference -0.32, P<0.001) and high-dose ICS groups (adjusted mean difference -0.40, P<0.001), compared with healthy controls. Besides, a significantly higher adiponectin level was found for both low-dose (adjusted mean difference 0.32, P<0.001) and high-dose ICS groups (adjusted mean difference 0.33, P=0.001). No significant association was found for hs-CRP.

Conclusions: Long-term ICS use is associated with significantly higher levels of adiponectin and lower insulin resistance, but not hs-CRP, in otherwise healthy asthmatics, compared with healthy controls.