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Steroid use and development of diabetes and weight change in a prospective international survey

Background: Sarcoidosis is a granulomatous disease related to the interplay of genetic factors and external environmental triggers. Glucocorticoid therapy has been used extensively for management of the disease and are recommended as first line therapy by the most recent treatment guidelines.¹ Glucocorticoid therapy has been shown to be highly toxic in multiple other autoimmune diseases leading to substantial work to identify steroid sparing therapies.^{2,3} In sarcoidosis there has been investigation of steroid sparing therapies⁴⁻⁷ but none are currently FDA approved for the treatment of sarcoidosis. This has led to significant financial barriers in prescribing of non-glucocorticoid therapy,⁸ and resulted in the majority of sarcoidosis patients being treated with steroid monotherapy.⁹

Methods: An electronic survey was developed by an international group of sarcoidosis experts in collaboration with sarcoidosis patients from the US and Europe. The survey was translated from English into Dutch, French, German, Italian, and Spanish by bilingual physicians with expertise in sarcoidosis. The survey was collected via an opt-in online survey distributed at sarcoidosis expert centers by flyers and online advertising, as well as online advertising through international pulmonary and sarcoidosis advocacy groups. We carried out ATT weighting on demographic and disease covariates. In a weighted sample we investigated with relationship between current steroid use vs. past or never steroid use on the development of new diabetes and change in weight adjusted for the duration of steroid use.

Results: We collected surveys from 1937 patients with sarcoidosis. 1208 surveys had complete data to allow for analysis of development of diabetes, while 1442 surveys had complete data to allow for analysis of changes in weight. Without adjustment, we identified an increased odds of development of diabetes in patients currently taking steroids (1.5, 95% CI 1.1-2.0) but without an associated change in weight (1.4kg, 95% CI -0.4 – 1.5 kg). In an ATT weighted model, we did not identify increased odds of development of diabetes (1.3, 95% CI 0.95-1.72), but did identify increased odds of development of diabetes with longer duration of steroid use in months (1.002, 95% CI 1.001-1.003). In an ATT weighted model, we did not identify changes in weight associated with current use of steroids (1.3 kg, 95% CI -0.54-3.14 kg), or duration of steroid use in months (0.002 kg, 95% CI -0.008-0.012kg).

Conclusions: Current steroid use was not associated with increased odds of development of diabetes or changes in weight when compared to past steroid use. The high rates of diabetes, and large changes of weight we identified in this sample suggest that the side effects of steroids may persist following discontinuation.