Oral corticosteroid (OCS) risk predictor for Type II Diabetes in asthma

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Introduction: OCS use is associated with adverse outcomes, including type II diabetes (DM-T2). Individualized models to estimate risks from prior and future OCS use could facilitate clinical planning.

Objective: Develop a model to estimate risk of DM-T2 in patients with asthma.

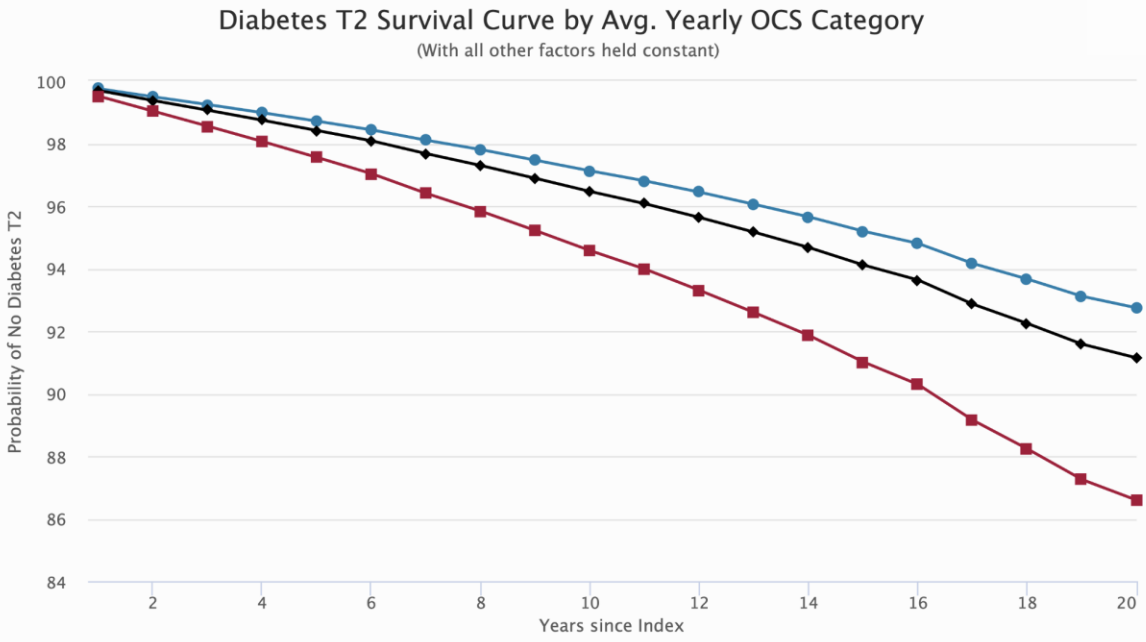
Methods: A historical cohort study of adults with asthma at index date with ≥2 years of baseline (pre-index) and ≥3 years of follow-up data (post-index) from the Optimum Patient Care Research Database. Primary outcome was time to DM-T2 diagnosis in those with no prior DM-T2 history. Cox regression models were used to model known DM-T2 risk factors selected from literature and included based on backwards stepwise selection, including change in average annual OCS use over time (decreased, no change, increased, **Figure**). The model was evaluated in 75% of patients and validated in the remainder. Kaplan Meier curves were used to evaluate separation between stratified risk groups.

Results: Overall, 104,461 patients met all inclusion criteria (7452 developed DM-T2). The model validation showed a consistently higher predicted DM-T2 risk among patients who increased their OCS use compared to baseline (HR for 1-step increase = 1.551). In an example patient, 20-year DM-T2 risks were 7.3%, 8.9%, and 13.4% for decreased, no change, and increased OCS usage, post-index date, respectively (**Figure**).

Conclusion: Risk for DM-T2 can be moderated by lowering OCS usage in asthma patients.

Funding: Funding for this study was provided by AstraZeneca.
Disclosures: AMG has attended advisory boards for GlaxoSmithKline, Novartis, AstraZeneca, Teva, and Sanofi; has received speaker fees from Novartis, AstraZeneca, Sanofi and Teva; has participated in research for which his host institution has been remunerated with AstraZeneca; has attended international conferences sponsored by Teva; and has consultancy agreements with AstraZeneca and Sanofi. JC, TT, and EM are employees of AstraZeneca.

Figure. Type II diabetes risk prediction in validation study population and an example individual OCS risk prediction.



Change in OCS use: Decrease 1 step (High to low; low to none) | No change | Increase 1 step (None to low; low to high)

Factors used for Modeling:

- **Age:** 51
- **BMI:** 22.8
- **Ethnicity:** White
- **Sex:** Female
- **Smoking:** Ex-smoker
- **Anxiety/depression:** Yes
- **Cerebro-cardiovascular disease:** No
- **Hypertension:** No
- **OCS Yearly Avg, pre-index:** 1 – Low OCS (<2 yearly avg)

	20-year T2 diabetes risk
Decrease OCS use	7.26%
No change	8.86%
Increase OCS use	13.41%