Metabolomic study links inhaled cortical steroid treatment for asthma to adrenal suppression

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Inhaled cortical steroids (ICS) can help patients manage asthma symptoms, and recent updates to asthma treatment guidelines have

expanded recommended, low-dose treatment. But concerns persist that ICS may reduce production of the steroid hormone cortisol in the body leading to adrenal suppression. While initial adrenal suppression symptoms are subtle, continued progression can lead to fatigue, headache, abdominal pain, vomiting and psychiatric symptoms.

Until now, studies of ICS and adrenal suppression have been limited and have produced conflicting findings. To better understand the association between ICS and adrenal suppression, researchers from Brigham and Women's Hospital and the University of Cambridge conducted the largest metabolomic study of asthma to date. By analyzing the blood plasma of 14,000 individuals from four independent study cohorts, the team identified 17 steroid metabolites that were reduced in individuals with asthma and found that, even among patients taking low-dose ICS, ICS usage was associated with reduced cortisol levels. The researchers also found significant associations between adrenal insufficiency symptoms, including fatigue and anemia, in asthma patients taking ICS treatment compared to those who were not.

"The use of ICS has been instrumental in reducing asthma exacerbations and improving overall quality of life. However, while their effectiveness should not be understated, our findings suggest that the risks of ICS usage must also be considered," said co-senior author Jessica Lasky-Su, ScD, of the Channing Division of Network Medicine at the Brigham.

"Our work suggests that simple measures, such as regular cortisol monitoring and prescription of the lowest effective ICS dose, may help to mitigate the systemic side effects of ICS use," said co-senior author Claudia Langenberg, MD, Ph.D., of the MRC Epidemiology Unit at the University of Cambridge, UK, and Berlin Institute of Health at Charité Universitätsmedizin, Germany.

The study is published in *Nature Medicine*.

More information: Jessica Lasky-Su, Metabolomic profiling reveals extensive adrenal suppression due to inhaled corticosteroid therapy in asthma, *Nature Medicine* (2022). DOI: 10.1038/s41591-022-01714-5. www.nature.com/articles/s41591-022-01714-5