IN YOUR PATIENTS WITH ASTHMA

LOOK BEYOND EOSINOPHIL AND IgE LEVELS TO GET A CLEARER PICTURE OF TYPE 2 INFLAMMATION¹

Type 2 asthma encompasses a range of biomarkers driven by Type 2 inflammation.¹

IL-4, IL-13, and IL-5 are key drivers of type 2 inflammation

IL-4 and IL-13 are central Type 2 cytokines with distinct and overlapping roles

*IL-4* drives Th2 cell differentiation and mediates the production of downstream Type 2 cytokines

*IL-13* mediates goblet cell hyperplasia and increased mucus secretion, and promotes airway obstruction, bronchial hyperactivity, smooth muscle hypertrophy, and airway remodelling

*IL-4* and *IL-13* play an important role in class switching of B cells to produce IgE

IL-5 mediates the differentiation of eosinophils in bone marrow; *IL-4* and *IL-13* drive the trafficking of eosinophils to sites of inflammation

Type 2 inflammation can result in increased exacerbations and decreased lung function

ILC2, type 2 innate lymphoid cells; TSLP, thymic stromal lymphopoietin.

REFERENCES:
Type 2 asthma is a heterogenous disease that encompasses a range of phenotypes and biomarkers\textsuperscript{1-3}

\textbf{TYPE 2 ASTHMA\textsuperscript{4-6}}

\textbf{REFERENCES:}

Use of serum IgE levels, blood eosinophils, or FeNO alone as asthma biomarkers may fail to accurately characterize the broad spectrum of Type 2 inflammation\textsuperscript{7-9}

Reliance on a narrow range of biomarkers may leave patients with Type 2 asthma suboptimally controlled\textsuperscript{7-9}

EOS, eosinophils; FeNO, fractional exhaled nitric oxide.
ALLERGIC ASTHMA IS MEDIATED BY THE TYPE 2 IMMUNE RESPONSE

IL-4 drives Th2 cell differentiation

IL-4 and IL-13 promote class switching of B cells to produce IgE

IL-4 and IL-13 play an important role in allergic inflammation in asthma

REFERENCES:
IL-4, IL-13, and IL-5 are key drivers in CRSwNP

IL-4 and IL-13 are central Type 2 cytokines with distinct and overlapping roles

CRSwNP involves a distinct Type 2 cytokine profile, including:

- A lack of regulatory T-cell (Treg) function
- Local IgE production induced by IL-4 and IL-13
- Eosinophilic inflammation induced by IL-4 and IL-13 as well as IL-5

**REFERENCES:**
Upper airway comorbidities

Nasal Polyps

- Nasal Polyps are associated with severe asthma and present additional challenges for optimal patient management.

Chronic rhinosinusitis with nasal polyps (CRSwNP)

- Patients with CRSwNP have a higher prevalence of premorbid and concurrent asthma.

Allergic rhinitis and rhinosinusitis

- Patients with uncontrolled persistent asthma show a higher prevalence of comorbid allergic rhinitis and rhinosinusitis.

Upper airway comorbidities may signal Type 2 inflammation in the lower airway

REFERENCES:

Lung function is critical to the assessment of future risk in patients with asthma³

- Patients with frequent exacerbations and moderate-to-severe asthma experienced a significantly greater annual decline in FEV₁ in a long-term study, compared with patients who had infrequent exacerbations⁴
- Early and sustained improvements in lung function following therapy initiation reduced the rate and severity of future exacerbations⁵

Lung function should be measured as part of the assessment of asthma control.³

At the start of treatment
After 3 to 6 months of treatment
Periodically thereafter for ongoing risk assessment

Improving lung function is a goal of optimal asthma management³

REFERENCES:
Patients with uncontrolled persistent asthma may experience higher exacerbation rates, impaired lung function, risk of long-term OCS side effects, and poor quality of life\textsuperscript{1-6}

**Higher exacerbation rates**
- Exacerbations were 3 times more likely to occur in patients with uncontrolled asthma than in those with better asthma control\textsuperscript{1}

**Impaired lung function**
- Airway remodelling, often driven by persistent Type 2 inflammation, can lead to impaired lung function in both the large and small airways\textsuperscript{7-10}

**Potential side effects with OCS**
- Due to the potential for substantial side effects with OCS use, guidelines suggest not using OCS as maintenance therapy until all other pharmacologic options have been exhausted\textsuperscript{11,12}
- Long-term use of OCS has been associated with osteoporosis, arterial hypertension, diabetes and metabolic syndrome, dyslipidemia, obesity, cataracts, glaucoma, gastrointestinal bleeds/ulcers, tuberculosis, depression, herpes and sepsis\textsuperscript{6,13}
- Anxiety and depression worsen symptoms and complicate disease management\textsuperscript{5}

**Poor QoL**
- Patients miss out on outdoor, physical, and other daily activities\textsuperscript{4}

There remains an unmet need to provide comprehensive care for patients with uncontrolled persistent asthma\textsuperscript{12,14,15}

OCS, oral corticosteroids; QoL, quality of life.

**REFERENCES:**