

Brief Research Report

Limited value of routine chest X-rays before biologic therapy in CRSwNP

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ABSTRACT

INTRODUCTION. Biologic therapies for chronic rhinosinusitis with nasal polyps (CRSwNP) have been approved in Denmark since 2022. Chest X-ray (CXR) was implemented by the Global Airways Steering Group as pre-treatment screening to identify pulmonary conditions and monitor adverse effects. This study evaluates the utility of routine CXR screening before initiating biological therapy in patients with CRSwNP.

METHODS. Baseline data, including chest X-ray, were collected prospectively in the nationwide Global Airways Registry (approved by the Danish Research Ethics Committee R. no.: H-21020685) and analysed in May 2025.

RESULTS. A total of 511 patients (335 males, 176 females; mean age 46.5 ± 14.6) years were identified and included in this study; 247 patients were initiated on biologic therapy. In the treatment group, 136 (55%) had normal CXRs, and 12 (5%) had abnormal findings. Among the 264 patients who did not receive biologic treatment, 143 (54%) had normal CXRs and ten (4%) demonstrated abnormal findings.

CONCLUSIONS. Routine baseline CXR screening before biologic therapy in patients with CRSwNP identified few abnormal findings. Accordingly, routine CXR is likely to offer limited clinical benefit.

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TRIAL REGISTRATION. Not relevant.

Type 2 inflammation plays a major role in the pathophysiology of chronic rhinosinusitis with nasal polyps (CRSwNP). CRSwNP frequently co-occurs with asthma and/or non-steroidal drug-exacerbated respiratory disease [1].

Targeted biologic therapies using monoclonal antibodies, such as mepolizumab (an interleukin (IL)-5 inhibitor) and dupilumab (targeting the IL-4 and IL-13 pathways), have demonstrated significant efficacy in patients with CRSwNP, asthma or combined upper and lower airway disease, particularly in those with elevated eosinophil levels [2].

Since November 2022, mepolizumab and dupilumab have been approved for use in selected patients with CRSwNP in Denmark. In parallel, the nationwide Global Airways Registry [3] was established across nine medical centres to systematically evaluate patients with severe CRSwNP referred for consideration of biologic

therapy. Eligible patients were treated with either mepolizumab or dupilumab.

Many patients with CRSwNP also suffer from lower airway disease with both shortness of breath and cough, and as many as 70% were diagnosed with asthma [3]. Chest X-ray (CXR) was implemented by the Global Airways Steering Group as a standard pre-treatment assessment to identify pre-existing pulmonary conditions, including infection, inflammation, nodules or malignancy, and to provide a baseline reference for monitoring potential adverse effects. Mepolizumab has been associated with pulmonary adverse reactions such as dyspnoea, cough and asthma exacerbation [4], whereas dupilumab has been linked to drug-induced interstitial lung disease, eosinophilic pneumonia and diffuse alveolar haemorrhage [5].

However, clinical observations have raised questions regarding the utility of routine CXR screening in patients with CRSwNP prior to initiation of biologic therapy. To address this, we conducted a retrospective evaluation of all patients enrolled in the Global Airways Registry as of 1 May 2025.

Methods

All patients were enrolled in the nationwide Global Airways Registry, which received approval from the Danish Research Ethics Committee (R. no.: H-21020685). Written informed consent was obtained from all participants for the use of their registry data for research purposes and for publication in anonymised form.

According to the Danish Medical Council (DMC) criteria [6], eligibility for biologic therapy in CRSwNP requires the presence of bilateral nasal or sinus polyps, a history of at least one functional endoscopic sinus surgery within the preceding three years, evidence of type 2 inflammation and documented adherence (> 80%) to a minimum of three months of intranasal corticosteroid therapy combined with saline irrigation. In addition, patients must meet at least three of the following five criteria: ≥ 2 courses of systemic corticosteroids, a Sino-Nasal Outcome Test (SNOT-22) score ≥ 50 , impaired olfactory function (Sniffin' Sticks Identification Test-16 score ≤ 8), a nasal polyp score ≥ 5 or concomitant asthma treated with inhaled corticosteroids.

All patients underwent comprehensive nasal and sinus evaluation and CT of the paranasal sinuses [7]. Pulmonary assessment comprised symptom-based asthma questionnaires (Asthma Control Test, VAS for asthma and Asthma Control Questionnaire), spirometry, including the ratio of forced expiratory volume in 1 second (FEV₁) to forced vital capacity (FVC) and chest X-ray (CXR).

Evidence of type 2 inflammation was established by measurement of blood and polyp eosinophil counts, fractional exhaled nitric oxide and high-sensitivity CRP.

All patients were registered in the Danish Global Airways database [3].

Trial registration: not relevant.

Results

A total of 511 patients were identified, comprising 335 males and 176 females, with a mean age of 46.5 ± 14.6 years. Among these, 353 patients (69%) were receiving inhaled-corticosteroid therapy for asthma (**Table 1**).

TABLE 1 Baseline characteristics.

Patients, N (%)	511 (100)
Gender: male/female, n (%)	335 (65.6)/176 (34.4)
Age, mean $\pm$ SD, yrs	46.5 $\pm$ 14.6
BMI, mean $\pm$ SD, kg/m ²	27 $\pm$ 5.2
Asthma ICS therapy, n (%)	353 (69)
ACQ score, mean $\pm$ SD	1.72 $\pm$ 1.19
ACT score, mean $\pm$ SD	17.8 $\pm$ 5.2
Biologic treatment, n (%)	247 (48)

ACQ = Asthma Control Questionnaire; ACT = Asthma Control Test;
ICS = inhaled corticosteroid.

A total of 247 patients initiated biologic therapy. Among these, 136 patients (55%) had normal baseline chest radiographs, 12 (5%) had abnormal findings and 99 (40%) did not undergo CXR prior to treatment initiation. In contrast, among the 264 patients with CRSwNP who did not meet the DMC criteria for biologic therapy, 143 (54%) had normal CXRs, ten (4%) demonstrated abnormal findings and 111 (42%) did not undergo baseline imaging (Table 2).

TABLE 2 Chest X-ray (CXR).

Treatment	Patients, N	CXR, n (%)		
		normal	abnormal	not complete
Biologic	247	136 (55)	12 (5)	99 (40)
Non-biologic	264	143 (54)	10 (4)	111 (42)

Electronic medical records were reviewed for all patients with abnormal CXRs. Findings included lung atelectasis (n = 6), pleural plaques (n = 2), accentuated bronchovascular markings (n = 2), pulmonary emphysema (n = 2), pulmonary nodules (n = 1), perihilar vascular congestion (n = 1), a solitary pulmonary nodule (n = 1), a cavitory lesion (n = 1), subdiaphragmatic free gas secondary to prior surgery (n = 1) and chronic parenchymal changes (n = 1).

Most abnormalities identified on the CXRs were already known from prior clinical follow-up cases. Patients with a solitary pulmonary nodule, a cavitory lesion or pleural plaques were referred for follow-up CTs. However, none of the abnormal findings led to a delay or modification in biologic treatment.

Conclusions

Clinical evaluation, validated outcome measures, quality-of-life assessments and CT imaging of the nasal cavity and sinuses are sufficient to assess treatment efficacy in patients with CRSwNP receiving biologic therapy. Accordingly, routine baseline CXR screening before initiation of biologic therapy in patients with CRSwNP appears to offer limited additional clinical benefit.

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