Adverse events for biologics in patients with CRSwNP: A meta-analysis

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Abstract

Immunoglobulin E (IgE) is a key mediator for the immune reaction in airway mucosa and plays a vital role in nasal polyposis(NP). We review the most recent evidence for the local IgE's characteristics, the modulation of its synthesis and function in NPs. The level of local IgE is significantly elevated in polyps independently of IgE serum levels and atopic status. Furthermore, local IgE is polyclonal and functional, which is correlated with type 2 inflammation. IgE is produced by active B cell and dependent on the classing switch recombination(CSR). In NPs, this process is triggered by not only allergens but also microbial colonization, especially the superantigen- Staphylococcus aureus. The production of local IgE is modulated by lymphocytes, cytokines, transcription factors and B cell intrinsic factor. Due to the central role of IgE in NPs, it is regarded as an ideal target for therapy and has been proved to be clinically successful. Based on this knowledge, we believe that exploring the trigger and regulatory factors for the activation of local B cells and CSR to IgE will provide more valuable information for us to recognize the pathological mechanisms of local IgE and offer the possible option for new therapeutic targets of NPs.

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authors	year	type	study name	clinicaltrials.gov(CTG)	country	study population	treatment protocol	treatment patients	control patients	monoclonal antibody	treatment(week)	follow-up	outcomes
Claus Bachert	2016	RCT, Phase II		NCT01920893	USA, Belgium, Spain, Sweden	CRSwNP	Subcutaneous injection of 600-mg loading dose of dupilumab or matched placebo followed by 15 weekly doses of 300 mg of dupilumab or matched placebo	30	30	dupilumab or placebo weekly	16	16	Greater improvement with dupilumab in: - NPS - Lund–Mackay score - Nasal airflow - CT volume of disease - SNOT-22 - UPSIT score - Diary symptoms - IgE - TARC
Claus Bachert	2017	RCT, phase II	GSK ID 111782	NCT01362244	Belgium, Netherlands, and the United Kingdom	CRSwNP	Intravenous infusion of 750 mg of mepolizumab or matched placebo every 4 wk for 6 doses	54	51	Mepolizumab(IL-5 mAb)		25w	Greater improvement in: Vas, SNOT-22, NPS reduce surgery associated burden for patients with severe nasal polyposis.
Claus Bachert	2019	RCT，Phase III	SINUS 24	NCT02912468	Bulgaria, Czechia, France, Germany, Hungary, Italy, the Netherlands, Poland, Romania, Ukraine, Russia, the UK, and the USA	CRSwNP	Subcutaneous injection of 300 mg of dupilumab every 2 wk or placebo for 24 wk	143	133	dupilumab(IL-4 mAb)		24w	Greater improvement with dupilumab in: - NPS - Lund–Mackay score - Nasal congestion - SNOT-22 - UPSIT score In dupilumab group: - Reduced need for systemic steroids - Reduced need for surgery to remove polyps
Claus Bachert 2019	2019	RCT, phase III	SINUS 52	NCT02898454	Argentina, Australia, Belgium, Canada, Chile, Israel, Mexico, Portugal, Russia, Spain, Sweden, Turkey, Japan, and the USA	CRSwNP	Subcutaneous injection of 300 mg every 2 wk for 52 wk or 300 mg every 2 wk for the first 24 wk followed by injections every 4 wk until reaching 52 wk, or received placebo	Dupilumab, q2w–q4w (n=145) Dupilumab, q2w (n=150)	153	dupilumab(IL-4 mAb)		52w	Greater improvement with dupilumab in: - NPS - Lund–Mackay score - Nasal congestion - SNOT-22 - UPSIT score In dupilumab group: - Reduced need for systemic steroids - Reduced need for surgery to remove polyps
Philippe Gevaert	2011	RCT, phase II		CRT110178	Belgium	CRSwNP	Two single intravenous infusions (28 d apart) of 750 mg of mepolizumab or placebo	20	10	Mepolizumab(IL-5 mAb)		48w	Greater improvement in: symptom score, NPS, CT score
Philippe Gevaert	2013	RCT, phase II			Belgium	CRSwNP comorbid with asthma	Subcutaneous injection of omalizumab or matched placebo every 2 or 4 wk based on total serum IgE levels and body weight	16	8	Omalizumab(IgE mAB)		16W	Greater improvement in: symptom score, SF-36, RSOM, NPS, CT score
Philippe Gevaert	2020	RCT, phase III	POLYP1	NCT03280550	rth America and Euro	severe CRSwNP	Subcutaneous injection of omalizumab or matched placebo every 2 or 4 wk based on total serum IgE levels and body weight	72	66	Omalizumab(IgE mAB)	24W	24W	significant reduction in NPS and NCS (nasal congestion score)
Philippe Gevaert	2020	RCT, phase III	POLYP2	NCT03280537	rth America and Euro	severe CRSwNP	Subcutaneous injection of omalizumab or matched placebo every 2 or 4 wk based on total serum IgE levels and body weight	62	65	Omalizumab(IgE mAB)	24W	24W	significant reduction in NPS and NCS (nasal congestion score)