

35202

Real-life biomarker response to anti-IL5 and anti-IgE therapies in severe asthma patients

Severe asthma, Biomarkers, Treatments

S. Burkill¹, C. M. Porsbjerg², A. Bourdin³, T. N Tran⁴, N. Martin⁴, R. Katial⁴, P. Barker⁴, M. E Wechsler⁵, J. Maspero⁶, S. Bosnic-Anticevich⁷, L. P. Chung⁸, G. Katsoulotos⁹, G. C Christoff¹⁰, T. A Popov¹¹, M. Sadatsafavi¹², C. A Torres-Duque¹³, C. Ulrik¹⁴, K. Dahl Assing¹⁵, S. Hansen¹⁶, A. Altraja¹⁷, L. A Lehtimaki¹⁸, N. G Papadopoulos¹⁹, K. Kostikas²⁰, S. Salvi²¹, R. W Costello²², P. Francesca²³, T. Iwanaga²⁴, C. K. Rhee²⁵, M. Al-Ahmad²⁶, D. Larenas-Linnemann²⁷, J. A Fonseca²⁸, R. Amaral²⁹, K. Alving²⁹, R. Al-Lehebi³⁰, L. Perez De-Llano³¹, B. Kirenga³², M. J. Tsai³³, B. Mahboub³⁴, P. E Pfeffer³⁵, W. Henley¹, Y. Liu³⁶, J. Lyu¹, C. Goh¹, T. Uthaman¹, D. Price¹

¹Observational and Pragmatic Research Institute - Singapore (Singapore), ²Respiratory Research Unit, Copenhagen University Hospital - Bispebjerg (Denmark), ³PhyMedExp, Univ Montpellier, CNRS, INSERM, CHU Montpellier - Montpellier (France), ⁴AstraZeneca - Gaithersburg (USA), ⁵NJH Cohen Family Asthma Institute, Department of Medicine, National Jewish Health - Denver (USA), ⁶Clinical Research for Allergy and Respiratory Medicine, CIDEA Foundation - Buenos Aires (Argentina), ⁷Sydney Pharmacy School, Faculty of Medicine and Health, The University of Sydney - Sydney (Australia), ⁸Fiona Stanley Hospital - Perth (Australia), ⁹Woolcock Institute of Medical Research, The University of Sydney - Sydney (Australia), ¹⁰Medical University-Sofia, Faculty of Public Health - Sofia (Bulgaria), ¹¹University Hospital "Sv. Ivan Rilski" - Sofia (Bulgaria), ¹²Respiratory Evaluation Sciences Program, Faculty of Pharmaceutical Sciences, University of British Columbia - Vancouver (Canada), ¹³INEUMO, Research Center, Fundación Neumológica Colombiana - Bogotá (Colombia), ¹⁴Respiratory Research Unit, Department of Respiratory Medicine, Copenhagen University Hospital-Hvidovre - Hvidovre (Denmark), ¹⁵Department of Respiratory Medicine, Aalborg University Hospital - Aalborg (Denmark), ¹⁶Respiratory Research Unit, Bispebjerg University Hospital - Copenhagen (Denmark), ¹⁷Department of Pulmonology, University of Tartu and Lung Clinic, Tartu University Hospital - Tartu (Estonia), ¹⁸Allergy Centre, Tampere University Hospital - Tampere (Finland), ¹⁹Allergy Department, 2nd Pediatric Clinic, University of Athens - Athens (Greece), ²⁰Respiratory Medicine Department, University of Ioannina - Ioannina (Greece), ²¹Pulmocare Research and Education Foundation - Pune (India), ²²Clinical Research Centre, Smurfit Building Beaumont Hospital, Department of Respiratory Medicine, RCSI - Dublin (Ireland), ²³Personalized Medicine, Asthma and Allergy, Humanitas Clinical and Research Center IRCCS -

Rozzano (Italy), ²⁴Center for General Medical Education and Clinical Training, Kindai University Hospital - Osakasayama (Japan), ²⁵Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea - Seoul (South Korea), ²⁶Microbiology Department, Faculty of Medicine, Kuwait University, Al-Rashed Allergy Center, Ministry of Health - Kuwait (Kuwait), ²⁷Centro de Excelencia en Asma y Alergia, Hospital Médica Sur - Ciudad de México (Mexico), ²⁸Health Information and Decision Sciences Department (MEDCIDS) & Center for Health Technology and Services Research (CINTESIS), Faculty of Medicine of University of Porto - Porto (Portugal), ²⁹Department of Women's and Children's Health, Uppsala University - Sweden (Sweden), ³⁰Department of Pulmonology, King Fahad Medical City - Riyadh (Saudi Arabia), ³¹Pneumology Service, Lucus Augusti University Hospital, EOXI Lugo - Monforte, Cervo (Italy), ³²Makerere University Lung Institute - Kampala (Uganda), ³³Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung Medical University - Taiwan (Taiwan), ³⁴College of Medicine, University of Sharjah - Sharjah (Utd.Arab Emir.), ³⁵Department of Respiratory Medicine, Barts Health NHS Trust - London (United Kingdom), ³⁶Consulting, Strategy AI & Transformation, Deloitte - Brisbane (Australia)

Introduction/Background: Biologics (Bx) are known to decrease specific biomarker levels: anti-IL5 reduces blood eosinophils (BEC) and anti-IgE slightly reduces FeNO. Anti-IL5 and anti-IgE are thought to have limited effect on total IgE (IgE).

Aims and Objectives: To assess the proportions of severe asthma patients whose biomarkers (BEC, FeNO, and serum IgE) decrease following anti-IL5 and anti-IgE initiation.

Methods: Patients in the International Severe Asthma Registry (ISAR) with biomarker and Bx data were included. From pre-Bx baseline to the post-Bx time period, the median (IQR) change in biomarker level and the proportion of patients with >25% decrease in biomarkers were determined.

Results: At 2-3 years from Bx initiation, BEC decreased by >25% in 80.7% of anti-IL5 and 41.6% of anti-IgE patients. FeNO decreased by >25% in 41.6% of anti-IL5 and 47.8% of anti-IgE patients. IgE decreased by >25% in 41.7% of anti-IL5 and 15.6% of anti-IgE patients (Figure).

Figure: Median (IQR) biomarker changes and patient proportions with decreased biomarkers in response to Bx.

Biologic treatment duration (from pre-biologic baseline)	BEC (cells/ μ L)			FeNO (ppb)				
	N	Median (IQR) change	Patients (n [%]) with >25% drop in BEC	N	Median (IQR) change	Patients (n [%]) with >25% drop in FeNO	N	Median
Anti-IL5 patients								
0 to 3 months	234	-400 (-900 to -100)	187 (82)	113	-1 (-20 to 12)	45 (39.8)	37	-23
3 to 12 months	516	-400 (-750 to -100)	414 (82.1)	327	0 (-21 to 14)	117 (35.8)	121	0 (-
1 to 2 years	442	-345 (-600 to -100)	344 (78.7)	309	-4 (-25 to 10)	121 (39.2)	85	-3
2 to 3 years	218	-340 (-620 to -90)	171 (80.7)	154	-3.5 (-21 to 10)	64 (41.6)	24	-1.2 (-
Anti-IgE patients								
0 to 3 months	82	-114.5 (-450 to 0)	48 (60)	49	-17 (-51 to 1)	29 (59.2)	35	180
3 to 12 months	176	-22 (-200 to 25)	73 (42.2)	81	-7 (-24 to 4)	37 (45.7)	70	77.2 (
1 to 2 years	178	-10 (-200 to 100)	71 (40.8)	75	-4 (-31 to 3)	35 (46.7)	71	160
2 to 3 years	103	-30 (-200 to 100)	42 (41.6)	46	-3.5 (-28 to 4)	22 (47.8)	45	126 (

Conclusions: Anti-IL5 was superior in decreasing BEC and both Bx classes decreased FeNO to a limited extent. The lower proportion of anti-IgE patients with IgE reduction could be attributed to serum total IgE (not free IgE) measurement. Apart from anti-IL5's effect on BEC, <50% patients had decreased biomarkers; the clinical implications should be explored.