ATS 2016 Where today's science meets tomorrow's care™
International Conference May 13 - May 18
San Francisco

FOR RELEASE
Embargoed until May 15, 2016, 9 a.m. PDT

FOR MORE INFORMATION, CONTACT:
Dacia Morris
dmorris@thoracic.org
ATS Office: 212-315-8620 (until May 11)
Cell Phone: 917-561-6545

Session: A16 Epidemiology and Health Care Costs of Pediatric and Adult Asthma
Sunday, May 15, 2016, 9 a.m.–9:15 a.m.
Location: Room 3020/3022 (West Building, Level 3), MOSCONE CENTER

Very Poorly Controlled Asthma Highly Prevalent in TENOR II Cohort After More Than a Decade

ATS 2016, SAN FRANCISCO ─ Nearly half (48%) of patients with severe or difficult-to-treat asthma in The Epidemiology and Natural History of Asthma: Outcomes and Treatment Regimens follow-up study (TENOR II) still had very poorly controlled (VPC) symptoms after more than a decade of treatment, according to a new study presented at the ATS 2016 International Conference. The risk of persistent VPC asthma was associated with specific demographic and clinical factors.

The TENOR II study examined the prevalence of persistent VPC asthma more than 10 years after the TENOR I study. TENOR II was a multicenter, observational study with a single follow-up visit in 2014. It included 341 patients, with 327 patients having an available level of asthma control for both the TENOR I and II time points.

Patients' asthma was categorized using National Heart, Lung, and Blood Institute asthma guidelines. "Persistent VPC asthma was defined as having VPC asthma at both TENOR I and TENOR II enrollment visits; the comparison group had well or not well-controlled asthma at either visit," said lead investigator Tmirah Haselkorn, PhD, of EpiMetrix in Los Altos, California.

Asthma is considered well-controlled if symptoms occur twice a week or less; rescue bronchodilator medication is used twice a week or less; there is no nocturnal or early morning waking; there are no limitations on activities including work, school and exercise; patient and doctor consider the asthma well-controlled and the patient's peak expiratory flow is normal or personal best FEV_1. FEV_1 is the volume of air a person can forcefully exhale in one second.

Forty-eight percent of patients had persistent VPC asthma, and investigators found higher levels of comorbidities in patients with persistent VPC compared to non-persistent VPC asthma patients,

including gastroesophageal disease (52.2% versus 41.2%, respectively). Patients with persistent VPC also had lower lung function, and were more than three times as likely to require hospitalization/emergency department visits for exacerbations that required corticosteroids in the previous 12 months. About 25% of patients with persistent VPC asthma had not used a combined inhaled corticosteroid/long-acting beta$_2$-agonist medication in the prior six months; only 12.7% had used omalizumab.

Four variables assessed during TENOR I enrollment were significantly predictive of persistent VPC asthma: black race, current or past smoking status, corticosteroid course for worsening asthma in the previous three months and decreased post-bronchodilator forced expiratory flow in 1 second (FEV_1) .

"Patients with persistent VPC asthma demonstrated higher disease burden, compromised lung function, and higher total and specific immunoglobin E levels than patients with non-persistent VPC asthma," Haselkorn said. (Immunoglobin E is present in antibodies when someone has an allergic reaction). Medication data suggest that patients may be undertreated. Findings also suggest that patients may not be compliant with prescribed therapy.

When patients present with variables associated with a greater risk for VPC, clinicians should direct more intensive management of modifiable factors, such as smoking and lung function, as well as improved medication adherence or alternative treatment strategies, the investigators concluded.

Contact for study: T. Haselkorn, PhD, thaselko@gene.com

###

Abstract 4843

Prevalence and Risk Factors for Persistent Very Poorly Controlled (VPC) Asthma After More

Than a Decade in the TENOR II Cohort

T. Haselkorn[1], R.S. Zeiger[2], L. Borish[3], B. Paknis[4], E.R. Bleecker[5], A. Foreman[6], F. Kianifard[4], S.T. Weis[s7], B.E. Chipps[8], S.J. Szefler[9]

1EpiMetrix Inc - Los Altos, CA/US,
2Kaiser Permanente Southern Califonia - San Diego And Pasadena, CA/US,
3University of Virginia -Charlottesville, VA/US,
4Novartis Pharmaceuticals Corporation - East Hanover, NJ/US,
5Wake Forest School of Medicine - Winston-Salem, NC/US,
6ICON Plc - San Francisco, CA/US,
7Brigham and Women's Hospital and Harvard Medical School - Boston, MA/US,
8Capital Allergy and Respiratory Disease Center - Sacramento, CA/US,
9Children's Hospital Colorado - Aurora, CO/US

Rationale: The Epidemiology and Natural History of Asthma: Outcomes and Treatment Regimens (TENOR I) assessed the largest cohort of severe or difficult-to-treat asthma patients to date. TENOR II examined

prevalence of persistent very poorly controlled (VPC) asthma >10 years after TENOR I.
Methods: TENOR II (N=341) was a multicenter, observational study with a single, cross-sectional follow-up visit in 2014. Patients' asthma was classified as VPC based on the National Heart, Lung, and Blood Institute asthma guidelines. Persistent VPC asthma was defined as having VPC asthma at both TENOR I and TENOR II enrollment visits; the comparison group had well or not well controlled asthma at either visit. To assess long-term predictors of persistent VPC asthma, a multivariable logistic regression model was fitted using twelve TENOR I baseline candidate predictors (Figure 1).
Results: Of the 327 TENOR II patients with available level of asthma control at both time points, nearly half (48.0%, n=157) had persistent VPC asthma. Higher levels of comorbidities were reported by patients with persistent VPC compared to non-persistent VPC asthma patients, including gastroesophagael reflux disease (52.2% versus 41.2%, respectively). Persistent VPC patients were more than three times as likely to require hospitalization/emergency department visit for exacerbations requiring corticosteroids in the prior 12 months (29.7% versus 9.0% respectively). Mean (SD) pre- and post-bronchodilator percent predicted FEV1 was lower in persistent VPC patients than non-persistent VPC patients [(62.5% (22.7%) versus 82.1% (15.7%)), respectively, and (69.1% (22.3%) versus 86.5% (15.6%)), respectively]. Total IgE geometric mean (95% CI) was higher in persistent VPC patients than non-persistent VPC patients [89.3 (68.9, 115.8) versus 55.7 (38.8, 80.0)], and the percentage of patients who reported positive for any specific IgE (≥0.35kU/L) was slightly higher (75.2% versus 70.2%, respectively). In multivariable analyses, five variables measured at TENOR I enrollment were significantly predictive of persistent VPC asthma: Black race (versus White), current or past smoking status (versus never smoked), FEV1 % predicted post-bronchodilator [per 10% decrease] and corticosteroid course for worsening asthma in the prior 3 months (Figure 1).
Conclusions: Despite treatment with standard of care therapy, persistent VPC asthma was highly prevalent after >10 years in patients with severe or difficult-to-treat asthma. These patients demonstrated higher disease burden, compromised lung function, and higher total and specific IgE levels than patients with non-persistent VPC asthma. Several demographic and clinical factors were predictive of persistent VPC outcome and their presence should direct more intensive management of modifiable factors.

Predictor	OR	95% CI	P value
Non-allergic Asthma Trigger Count 1 vs. 0	0.56	(0.22, 1.43)	0.223
2 vs. 0	0.66	(0.25, 1.73)	0.403
ER Visit or Overnight Hospitalization in Past 3 Months	0.52	(0.22, 1.27)	0.152
Sex: Male vs. Female	0.65	(0.35, 1.21)	0.171
Aspirin Asthma Trigger	0.89	(0.43, 1.82)	0.742
Age (per 5 years)	0.97	(0.86, 1.09)	0.558
Duration of Asthma (per 5 years)	1.05	(0.96, 1.15)	0.331
Allergic Asthma Trigger Count [b]: 1vs. 0	1.13	(0.29, 4.42)	0.858
2 vs. 0	1.31	(0.36, 4.79)	0.683
3 vs. 0	2.44	(0.66, 9.04)	0.181
4 vs. 0	3.23	(0.86, 12.07)	0.081
Obese (BMI >=30): Yes vs. No	1.35	(0.78, 2.36)	0.289
FEV_1 % Pred Post-Bronch (per 10% decrease) [a]	1.57	(1.33, 1.86)	<0.001
Race: Asian or Pacific Islander vs. White	1.62	(0.54, 4.86)	0.394
Black vs. White	5.88	(2.24, 15.43)	<0.001
Hispanic/Other vs. White	1.18	(0.17, 7.95)	0.869
Corticosteroid Burst in Past Three Months	2.35	(1.28, 4.34)	0.006
Smoking Status: Current vs. Never	12.00	(1.32, 109.14)	0.027
Past vs. Never	2.12	(1.08, 4.17)	0.029

BMI: Body Mass Index; CI: Confidence Interval; ER: Emergency Room; FEV: Forced Expiratory Volume; OR: Odds Ratio;
[a] Per 10% decrease refers to the odds of persistent VPC asthma increasing by 56.9% for each 10% decrease in post-bronchodilator percent predicted FEV_1
[b] Asthma triggers were self-reported and were categorized as allergic (pollen, dust, animals, or mold/dampness) and non-allergic (emotional stress or cold/sinus infection) and the number of triggers were counted and reported for each of the two categories for each patient.