



REPORT FROM

ERS International congress 2023

Milan, Italy, Sept 12, 2023

Warm greetings from Milan!

There is a difference between weather and climate, but still, one cannot help wondering if the current temperatures in Milan around 30 degrees is not to underline what a hot topic global warming is. The congress theme is *Pollution, climate change and sustainable developments* and the aim has been to integrate these themes as broadly as possible. The interconnection between planet health and respiratory health is becoming more and more evident. Pollutants are not only a health hazard, but many pollutants are also sources of high CO₂ emissions.¹ Use of fossil fuels causes both particulate matter and CO₂. We breathe climate change, and addressing emissions will benefit both planet and human health.



So, the elephant-in-the-room-question came up in a symposium about pollution and climate changes: how do we justify flying thousands of participants from around the world for a congress? The response from the panel was that ERS will continue to offer hybrid congresses for environmental reasons, to

recommend travelling by train where feasible and by proposing climate compensation for those who fly. This will leave Milan with more trees after the congress. Frequency of global conferences can of course also be reassessed, but it is difficult to get the same interaction and sense of engagement from online participation, and close to impossible to get the same opportunities of collegial interaction and unexpected conversations in any other way than to meet as a community.

As a community, the health care sector can utilize its credibility to put pressure on policy makers to take action to reduce air pollution. Maria Neira, WHO, urged the audience to be very cautious about terminology and to be strategic about using positive arguments for the health benefits of fighting air pollution. Strategy is vital because, as she pointed out, before we had ONE industry to fight (referring to the tobacco industry) whereas now, the health threats related to emissions are coming from all sectors - including health care.

To improve air quality is to reduce future healthcare costs related to treating preventable diseases.

Reference:

1. Air pollution (who.int) internet page visited September 11, 2023



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Pulmonary rehabilitation in severe and very severe COPD

At the Sunday session “Targeting treatable traits in severe chronic obstructive pulmonary disease: a nonpharmacological approach”, we got an update on ‘treatable traits’ for advanced COPD patients beyond ‘regular care’. There was a consensus throughout the session that we should regard the COPD patients as more than the diseased lung. Evidence evolved during the past decade shows that patients living with severe COPD benefit a lot from pulmonary rehabilitation programs. Frits M.E. Franssen from the Netherlands provided us with up-to-date insights on how to rehabilitate a severe COPD patient.

Franssen presented the definition of pulmonary rehabilitation as a comprehensive intervention based on a thorough patient assessment followed by patient tailored therapies. The aim of pulmonary rehabilitation is to improve the physical and psychological condition of patients, not only with COPD but also with other chronic respiratory diseases, as well as to promote a healthy lifestyle. There is an ongoing international debate about the core components of pulmonary rehabilitation. It is important to remember, says Franssen, that pulmonary rehabilitation is more than exercise training and education. If we look at the needs of individual patients, interventions like nutritional support, psychological support, lifestyle interventions, optimization of pharmacotherapies and adherence to medication and advanced care planning are also components with potentially large benefits. Looking closer at the benefits, most evidence is on improvement of exercise tolerance, reduction in shortness of breath and improvement in quality of life¹. However, studies also show that other important outcomes of pulmonary rehabilitation include improvement in body composition, reduction in psychological symptoms and reduction in mortality and re-admissions. Looking further into patient groups, hyperinflation is associated with dyspnoea, therefore patients with severe hyperinflation could

be prevented from exercising to a sufficient level. Interestingly, when targeting specifically at this group of patients, Vanfleteren and colleagues (Vanfleteren et al., Arch Phys Med Rehabil 2018) demonstrated that static lung hyperinflation does not prevent patients from benefiting from pulmonary rehabilitation.

Franssen concluded that pulmonary rehabilitation is a comprehensive, individualised intervention, which may target specific needs of patients with very severe COPD. One should adapt exercise training modalities to the needs of the individual patient. Patients with severe/very severe COPD benefit the most from traditional pulmonary rehabilitation programs. Hence, the most important message is that we should not withhold pulmonary rehabilitation from patients with severe/very severe COPD.

Reference:

1. McCarthy et al., Cochrane Syst Rev. 2015, Maltais et al., Am J Respir Crit Care Med 1996, Lindenauer et al., JAMA 2020, Schois et al., A J Respir Crit Care Med 1998, Maddocks et al., Thorax 2016, Coventry et al. J Psyccsom Res 2007, Stoilkova et al., Respir Med 2013, vivodlzev et al., CHEST 2010, Moore et al., CHEST 2017, Stefan et al., Am J Respir Crit Care Med 2021, Pitta et al, CHEST, 2008



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SECTION: Improving respiratory care from a primary care perspective

Sustained health system benefits of primary care based integrated disease management for COPD: an interrupted time series

Severe exacerbations in patients with chronic obstructive pulmonary disease (COPD) is a challenge for both patient and health care system. Methods to prevent exacerbations are therefore needed.

To evaluate whether a primary care integrated disease program (IDM) can reduce health service utilisation, patients with severe COPD were studied in a real-world setting. All individuals managed by the Best Care program (2011-2019, Ontario Canada) with a clinical diagnosis of COPD were included (N=2451, mean age 67 years, female rate 48.3). Primary endpoint was COPD-related hospital admissions and COPD related ED visits, and the secondary endpoint was all cause hospitalisations and admissions and all-cause ED visits.



Through an interrupted time series analysis of retrospective administrative data, the study assessed the number of COPD-related and all-cause hospital admissions and emergency department (ED) visits 36 month pre- and post IDM program initiation. IDM program patients were linked to

Best Care COPD is built around a triad of health care stakeholders including the patient/caregiver, the primary care provider, and a certified respiratory educator. The program is located at the primary care provider clinic and consists of a set of structured intervention including:

- assessment
- education
- self-management
- medication management
- skills training
- evaluation

administrative health databases in the study amassing 13,000 person years of follow-up. In the year prior to commencing IDM, 9.2% of individuals experienced a total of 383 COPD related hospitalisations, and 20.4% individuals generated 809 COPD-related ED visits.

The study found that the monthly rate of COPD related hospitalisation and ED-visits in 1000 individuals 12 month after program initiation was decrease by 9.1 and 19.0 respectively, corresponding to a relative reduction of 56% and 46%. After 36 months, monthly rate of events per 1000 individuals almost halved.

The study concluded, said presenter Christopher Liciskai, that primary care-based COPD IDM program was associated with significantly improved disease trajectory, and reduced COPD related and all-cause ED visits and hospitalisation.

Reference:

Ferrone M, et al. The impact of integrated disease management in high-risk COPD patients in primary care. *Npj Prim Care Respir Med.* 2019;29(1):8



Sarah Friberg

Value and access director

Suggested reading:

Global initiative for chronic obstructive lung disease. Global strategy for the diagnosis, management and prevention of chronic obstructive lung disease. Report;2023

Criner GJ, et al. Prevention of acute exacerbations of thoracic obstructive pulmonary disease: American College of Chest Physicians and Canadian Thoracic Society Guideline. *Chest.* 2015;147(4):894-942

Poot CC, Meijer E, Kruis AL, Smidt N, Chavannes NH, Honkoop PJ. Integrated disease management interventions for patients with chronic obstructive pulmonary disease. *Cochrane Database Syst Rev.* 2021;9(9):CD009437. Published 2021 Sep 8. doi:10.1002/14651858.CD009437.pub3

SECTION: Improving respiratory care from a primary care perspective

A systematic review of methods of scoring inhaler technique

For many decades, inhalers have been used to treat respiratory diseases. However, a recent study has shown that correct inhaler technique (IT) is becoming poorer and contributes to reduction in disease control¹.

A team of researchers from the UK came to realize that, to date, there were no known scoring systems to assess and quantify inhaler technique. In medicine, scoring systems are widely used and scoring IT has been observed as an outcome measure within research studies. Hence, the investigators conducted a systematic review to collate and evaluate methods of scoring IT in research literature.

Methodology:

- The literature search was conducted through EMBASE, MEDLINE, CINAHL, PubMed, BNI google scholar and citation searching.
- Asthma and COPD was the terms that the search was centred around.
- Use of score as an outcome to measure of inhaler technique was the eligible criteria for the publications included in the search.
- 77 articles were included in the systematic review

Articles were categorised and grouped according to the method of scoring IT and 6 themes identified;

- awarding 1-point per step
- grading final score
- points deducted from final scoring method
- expressing total score as a percentage
- weighting steps within the checklist
- “validated” scoring methods

All of the above mentioned methods brought challenges and uncertainties such as no consensus on score interpretation, complex and time consuming etc. For the investigators, this confirmed an unmet need for a validated scoring system to assess IT in clinical practice.

Investigator’s wish list for a scoring tool:

1. A standardised and content valid IT checklist
2. Robust validation processes to ensure the tool measures IT and highlights poor technique
3. A score yielding a meaningful outcome that can facilitate IT optimisation

A validated measurement tool, applicable to all inhaler device types, would, if available, be useful in clinical practice to better assess, measure, and optimise patient’s inhaler technique.

Reference:

1. J. Sanchis. Chest 2016. 150 (2).394-406



Maria Messerer
PhD, Medical director

Longitudinal cohorts in airway disease: What have they taught us about personalised treatment of our everyday patients?

Due to the nature of longitudinal studies, the data and learnings obtained are as plenty as they are important and relevant. This became very clear when attending the session covering four longitudinal studies from the field of asthma and COPD. During the discussions, it was also underlined that no trivial baseline characterisation of cohorts in clinical trials can be allowed in future to be able to see the full picture.

Kian Fan Chung (London, UK) shared insights from the U-BIOPRED cohort, investigating Unbiased Biomarkers for the Prediction of Respiratory Disease Outcomes.



Here, system biology was applied to reveal mechanisms of severe asthma. This resulted in the definition of several clusters, each comprising a distinct phenotype of the disease. One of the discovered clusters of biomarkers include the combination of blood eosinophils and fraction of exhaled nitric oxide, FeNO to be able to detect the IL-13 Type2 hi phenotype¹. Other clusters of bio-

marker combination define phenotypes of disease including “T2 low/non-T2”, which can either involve inflammasomes, Interferons and tumor-necrosis factor, or show signs of oxidative stress and aging, while being paucigranulocytic. Moreover, the role of mast cells in asthma was confirmed, and the importance of distinguished activation pathways, i.e. via IgE-receptor activation or Interleukin-33-receptor activation². Results from the U-BIOPRED cohort also identified interleukin-6 as a potentially important pharmaceutical target for a cluster of “IL-6 Transsignalling high” severe asthmatics³.

Read more about the study and its results on the homepage of the Innovative Medicine Initiative, <https://www.imi.europa.eu/projects-results/project-factsheets/u-biopred>

The COPDGene study was presented by MeiLan Han (Ann Arbor, USA). Initially set-up to investigate underlying genetic factors of COPD, this study currently collects data from the 15 year follow-up. Although this cohort of n=5564 subjects identified a list of genetic loci associated with COPD⁴ (Hobbs Nat Gen 2017), it is still a mystery how these genes influence COPD genesis, Dr. Han says. The impact of genes appears rather small and is only detectable if genes are combined. The cohort also found a group of subjects not fulfilling the diagnostic criteria of COPD, which nevertheless have symptoms, exacerbations and radiographic abnormalities⁵. Dr. Han refers to the “myth of the healthy smoker”.

The COPDGene cohort also collected data on the causes of deaths occurring and found that these differ between different GOLD stages. Milder disease leads to death by cardiovascular causes and lung cancer, while patients in GOLD 3 and 4 die in respiratory failure⁶.

Finding from the cohort actually led to changes in routines at in Michigan, USA: from CT scans, a PA:A enlargement is an indicator for increased risk of exacerbations and is now included in the CT report. Moreover, small airways disease is identified as a precursor for emphysema⁷ and now reported if present on CT scans.

References:

1. Pavlidis S, Takahashi K, Ng Kee Kwong F, et al. "T2-high" in severe asthma related to blood eosinophil, exhaled nitric oxide and serum periostin. *Eur Respir J*. 2019;53(1):1800938. Published 2019 Jan 3. doi:10.1183/13993003.00938-2018
2. Tiotiu A, Badi Y, Kermani NZ, et al. Association of Differential Mast Cell Activation with Granulocytic Inflammation in Severe Asthma. *Am J Respir Crit Care Med*. 2022;205(4):397-411. doi:10.1164/rccm.202102-0355OC
3. Jevnikar Z, Östling J, Ax E, et al. Epithelial IL-6 trans-signaling defines a new asthma phenotype with increased airway inflammation. *J Allergy Clin Immunol*. 2019;143(2):577-590. doi:10.1016/j.jaci.2018.05.026
4. Hobbs BD, de Jong K, Lamontagne M, et al. Genetic loci associated with chronic obstructive pulmonary disease overlap with loci for lung function and pulmonary fibrosis. *Nat Genet*. 2017;49(3):426-432. doi:10.1038/ng.3752
5. Regan EA, Lynch DA, Curran-Everett D, et al. Clinical and Radiologic Disease in Smokers With Normal Spirometry [published correction appears in *JAMA Intern Med*. 2015 Sep;175(9):1588]. *JAMA Intern Med*. 2015;175(9):1539-1549. doi:10.1001/jamainternmed.2015.2735
6. Labaki WW, Gu T, Murray S, et al. Causes of and Clinical Features Associated with Death in Tobacco Cigarette Users by Lung Function Impairment. *Am J Respir Crit Care Med*. 2023;208(4):451-460. doi:10.1164/rccm.202210-1887OC
7. Baraghoshi D, Strand M, Humphries SM, et al. Quantitative CT Evaluation of Emphysema Progression over 10 Years in the COPDGene Study. *Radiology*. 2023;307(4):e222786. doi:10.1148/radiol.222786



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Word of the day:

Have you heard about syndemic diseases yet?

- Most persons living a life with COPD have at least one additional, clinically relevant chronic disease
- Many chronic diseases have shared risk factors, eg aging, smoking, pollution, physical inactivity, and poverty
- Co-occurring diseases potentially share pathobiological mechanisms
- The term “syndemic” is used to describe the co-occurrence of diseases with shared mechanisms and risk factors
- Approaching syndemic diseases including COPD in the multimorbid stage clinically could lead to more patient-centric rather than a single-disease approach to therapy

Learn more about COPD and multimorbidity: recognising and addressing a syndemic occurrence here!

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