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Early Career Members at the ERS International Congress London 2016

Early Career Forum

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This year's ERS International Congress was, as always, well organised, providing participants with a good mixture of translational and clinical science. At Congress, the Junior Member title was changed to the Early Career Member (ECM) with the ERS defining an ECM as anyone under age of 40 years. Some of the newly titled "ECM Committee" have collated some interesting points that occurred during Congress for their assemblies, which should be of interest to all members.

Assembly 1

The largest ERS Assembly (Clinical) had a wide variety of educational, clinical and scientific sessions to offer its members this year. During the first day of the conference, many skills workshops focusing on techniques used in daily clinical practice were available as well as postgraduate courses focusing on giving the attendees experts opinions and insights into various disease areas, the management of rare diseases, and diagnostic approaches.

The Sunday morning started with the presentation of the best abstracts in asthma and

chronic obstructive pulmonary disease (COPD) as well as pulmonary rehabilitation and chronic care, attracting a large crowd eager to hear about the latest development in those particular fields. Afterwards, one of the symposia took a look into the future of clinical care, focusing on telemonitoring of ventilator-dependent patients.

A highlight of every conference is the many poster discussion sessions and thematic poster sessions that facilitate the interaction between experts in the respective fields as well as early career members presenting their data. Some of these sessions (e.g. the poster discussions about biomarkers and phenotypes of COPD and comorbidities) attracted so many participants that not everybody could fit into the designated room. Further highlights for newcomers and for seasoned participants alike were the grand rounds and Year in Review sessions, which were very well received.

Assembly 2

The presentations and abstracts in the respiratory critical care track were of very high quality this



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year. A highlight of the conference was the symposium on new tools for the early diagnosis of acute respiratory distress syndrome (ARDS). The main message that was echoed during the symposium was that we should no longer consider ARDS as a final diagnosis. Within the syndrome, there are several subgroups that respond differently to treatment. Paolo Pelosi (Milan, Italy) showed that therapeutic options are time dependent and that ARDS can be prevented with the appropriate supportive care, while Antonio Artigas (Sabadell, Spain) defended the importance the measurement of extravascular lung water to guide fluid strategy. Carolyn Calfee (San Francisco, CA, USA) went one step further: she used unsupervised analysis to group patients with a similar biological response together. There seems to be a relatively small portion of patients with a strong inflammatory response that are responsible for most of the mortality in the intensive care unit. Because these patients were derived from several randomised controlled trials, she could deduce that the patients who were in a hyperinflammatory state benefitted from increased levels of positive end-expiratory pressure and a conservative fluid protocol. The presenter argued that these results may bring a paradigm shift to the treatment of ARDS patients, after they are validated in observational cohort studies and tested in prospective biomarker-guided intervention studies.

Assembly 3

At this year's Congress, one term was omnipresent: "precision medicine". The US National Institutes of Health define precision medicine as a groundbreaking approach to disease prevention and treatment based on people's individual differences in environment, genes and lifestyle (www.nih.gov/precision-medicine-initiative-cohort-program). In fact, US President Barack Obama has launched a Precision Medicine Initiative in his 2015 State of the Union address to avoid further one-size-fits-all approaches in modern medicine.

In oncology, this has been already done for decades on a genetic level where patients obtain a selective, and thereby the most effective, treatment based on their individual mutations in disease-relevant genes. In respiratory diseases, one emerging example has been discussed beyond others: in asthmatic patients, treatment with antibodies targeting key cytokines, such as interleukin (IL)-4, IL-5 or IL-13, is only effective in patients with an eosinophilic, allergic asthma phenotype, for which they should be screened beforehand by biomarkers such as periostin levels.

However, it was addressed in various sessions at the Congress that the individual's environment, diet or lifestyles have been largely neglected so far. One proposition was to include microbiome analysis in patient characterisations, as the microbiome will, on

the one hand, mirror differences in environment or diet, but on the other hand, might also impact the treatment efficacy itself by modulating the host's immune system.

Assembly 5

The role of blood and sputum eosinophil count as a prognostic biomarker in COPD was thoroughly evaluated by several studies presented at the Congress. Several cohort studies with populations ranging from 35 to 6000 patients assessed whether high eosinophil count is associated with worse outcomes, namely more frequent exacerbations, more rapid lung function deterioration and mortality. Results have been controversial, suggesting the existence of significant confounding. Concurrent administration of inhaled corticosteroids (ICS) represents a significant confounding factor, and that was proved by a *post hoc* analysis of three large trials comparing long-acting β_2 -agonists (LABA)/ICS versus LABA alone for 48–72 weeks, which revealed ICS treatment eliminates the increased exacerbation risk of patients with high eosinophil count not receiving ICS. All in all, COPD patients with high eosinophil counts appear to represent a distinct phenotype with worse outcomes, which should be treated more aggressively. However, ICS should not be prioritised over LABA and long-acting muscarinic agonists (LAMA) combinations in the treatment of this phenotype, as FLAME, a 52-week trial with 3362 participants, suggested that LABA/LAMA combination is superior to LABA/ICS in reducing moderate to severe exacerbations, even in this subgroup of patients with high blood eosinophil counts.

Moreover, the COPDMAP consortium assessed the role of eosinophil count in COPD exacerbations and found that the absolute number of eosinophils is decreased, compared to the stable state, in exacerbations associated with potentially pathogenic microorganisms in sputum, and elevated in the absence of potentially pathogenic microorganisms. This suggests eosinophil count is an important biomarker for COPD exacerbations as well, and might predict response to corticosteroids and/or antibiotics in COPD exacerbations.

Assembly 6

One of the hot topics discussed at the ERS International Congress was the concept of short- and long-term effects of air pollution in lung health. One of the principal studies presented at the Congress was related to the Healthy Lungs for Life campaign, which looked at the impact of pollution from domestic coal use (black smoke and sulfur dioxide) and showed that people are almost twice as likely to die from a respiratory

condition if they were living in a more polluted area as a child in the 1950s compared to the least polluted areas. A second study lead by the Imperial College London, UK, followed 368 000 individuals over a 38-year period and confirmed similar results regarding long-term impact of exposure to a range of pollutants (black smoke, SO₂ and particulate matter with a diameter <10 µm) on respiratory mortality. A third study executed by the Flemish Institute for Technological Research (VITO) compared air quality monitoring with the results of repeated, yearly lung function testing in a cohort of 2449 healthy adults over a 4-year period. They concluded that higher exposure on the day and the day before the lung function testing could lead to a direct decrease in lung function. Another important topic that was discussed was related to the topic of occupational diseases worldwide with a special emphasis in developing countries, since >80% of the polluting industries belong to informal sectors and permissible exposure limits are rarely followed by the industries in these areas.

Assembly 7

The ERS International Congress 2016 in London provided reflections and updated insights for paediatricians, with numerous scientific and educational sessions. The following main topics debated were: respiratory syncytial virus (RSV), asthma and preschool wheezing, cystic fibrosis, and environmental factors predisposing to respiratory diseases.

An entire session was dedicated to RSV, focusing on burden, new treatment options, prevention strategies and impact on future respiratory health. For asthma, the assembly highlighted the role of ambient air and dietary exposures in the development of the disease, and the role of deep phenotyping techniques in improving treatment outcomes.

A preschool wheezing session reported progress in managing the condition and the future strategies for modifying the disease. Another session presented cystic fibrosis as a research model for other respiratory diseases and for strategies enabling transition from paediatric to adult healthcare services. Another session considered environmental factors, focusing on how global climate change and air pollution influence cardiopulmonary health. The Paediatric Year in Review session reported the most recent evidence on lower respiratory tract infections, on noninvasive respiratory supports and their role as noninvasive support in the neonatal intensive care unit, and on environmental threats to respiratory health and their influence in developing fetus and infants. A new issue discussed this year was respiratory health in refugee children, a hot topic for social media, but still underinvestigated in literature.

Assembly 9

One of the interesting poster discussion sessions for Assembly 9 was “Man *versus* machine: waves, frequency, and more in lung function”, which had a widely varying poster range that sparked some good debate within the room. The poster “‘Notch-shoulder’ pattern on flow volume loop: is it a clinically useful pattern or just a ‘normal’ variant?” had many physiologists in the room noting this on numerous spirometry patterns but who were unsure of what causes it or whether it is a natural-occurring variant. The presenters believe that there is a link between the observed pattern and gastro-oesophageal reflux disease following their analysis of six patients. The room felt this is certainly an interesting area and more investigations should be performed. Another topic of numerous posters focused on spirometry quality. One poster, “Quality of spirometry in silica, wood and foundry workers in GB”, examined the quality of research lung function testing in different workplaces and the potential impact of not performing reproducible tests as per the American Thoracic Society (ATS)/ERS standards. They assessed spirometry performed in workplaces as part of a 5-year longitudinal study as per the ATS/ERS standards and the potential effect of performing fewer than three trials was calculated. Assessment showed that relying solely on the first expiratory manoeuvre led to an average underestimate of the forced expiratory volume in 1 s of 120 mL, and on the first and second manoeuvre, an underestimate of 40 mL. The study has highlighted the importance of performing workplace spirometry to ATS/ERS standards for reproducibility.

Two other interesting posters looked at automated scoring *versus* manual scoring of a sleep study. In the poster, “Validation of automated *versus* manual scoring of cardio-respiratory sleep studies: a clinical audit”, 19 cardiorespiratory sleep studies were scored with human expert review. The audit suggested a >50% reduction in scoring time with apnoea-hypopnoea statistically but not clinically higher. While the group felt a “human eye” should always review the automated analysis, they concluded that automated analysis would save time. The second poster focusing on this topic, “An audit comparing automated scoring to physiologist scoring of semi polysomnography sleep studies”, aimed to see if decision making using automated scoring has the potential to speed up diagnosis and treatment for patients with sleep disordered breathing (SDB). Sleep studies were automatically scored, followed by manual scoring by a sleep physiologist. Data from 188 patients attending due to suspected SDB were prospectively audited. The audit results illustrated statistically significant differences between the scoring for all severity groups with the exception of the severe group. However, the 95% confidence intervals for each group demonstrated that using either automated or physiologist scoring does not impact on severity

grading and, consequently, would not alter clinical decision making.

Assembly 10

The emerging field of the microbiome and its role in health and disease featured prominently at this year's Congress with a number of sessions dedicated to this important topic. Notable presentations focused on the effects of early-life microbiota composition on subsequent development of allergic airway disease, and the complex relationship between the lung microbiome and innate immunity. There was also focus on the role of intestinal microbiota dysregulation in lung diseases, which stimulates interest into the importance of the gut-lung axis and raises a possible future role for probiotic supplementation for diseases such as COPD.

Tuberculosis also featured prominently, and an important update of the new ATS and ERS management guidelines was provided. There was also focus on the increasing global burden of latent tuberculosis infection with sessions dedicated to novel diagnostics and therapeutic strategies. Additionally, evolving challenges associated with the emergence and expansion of multidrug-resistant tuberculosis (MDR-TB) across Europe was the subject of a clinical symposium. The recent advances in diagnosing tuberculosis drug resistance and the development of novel therapeutic options for drug-resistant tuberculosis provide hope that the MDR-TB epidemic can be curbed.

Interest in the area of non-cystic fibrosis bronchiectasis continues to grow and an update was provided by the EMBARC (European Bronchiectasis Registry) study group, an ERS collaborative registry that has recruited over 4000 patients from 23 European countries to date. The group provided novel insight into management practices across Europe as well as an assessment of the value of severity scoring tools such as the Bronchiectasis Severity Index for prediction of adverse outcomes.

Assembly 11

Thoracic oncology sessions have provided the latest updates in the areas of lung cancer diagnosis and treatment, lung cancer screening and diagnosis, and management of incidental pulmonary nodules.

Paula Mulvenna (Newcastle upon Tyne, UK) presented results from the QUARTZ trial, in which patients with non-small cell lung cancer and inoperable brain metastasis were randomised into two groups, one treated with dexamethasone and optimal supportive care, and one treated with the these plus whole-brain radiotherapy (20 Gy in five

daily fractions). Although recruitment has been challenging, the preliminary data showed there was no significant difference in survival or in quality-adjusted life-years; however, completion of the trial would inform current clinical practice, which is currently variable. Joachim Pfannschmidt (Berlin, Germany), Rudolf M. Huber (Munich, Germany), Françoise Galateau-Salle (Caen, France) and Dirk R. de Ruysscher (Leuven, Belgium) provided an update about oligometastatic disease, its molecular background and highly individualised approaches that shed light into current controversies and practice variability with regards to their management.

In a dedicated lunchtime session on pulmonary nodules, Martine Remy-Jardin (Lille, France) shared her expertise and presented the radiologist's perspective about the two- versus three-dimensional analysis of incidental pulmonary nodules, while David Baldwin (Nottingham, UK) presented the clinician's perspective on their management and challenges faced in the implementation of current guidelines.

The Thoracic Oncology assembly set up early-morning sessions where challenging clinical cases were presented and stimulated fruitful multidisciplinary discussions about optimal patient management. Georgia Hardavella presented a case of a lung carcinoid that was deemed inoperable until patient was offered DOTA-octreotate positron emission tomography/magnetic resonance imaging, which completely changed the decision to treat, leading the patient to a successful surgical resection, therefore highlighting the importance of pioneering technology in the multidisciplinary management of patients with thoracic malignancies.

A scientific session dedicated to tyrosine kinase inhibitors (Rafael Rosell (Barcelona, Spain), Jacques Cadranel (Paris, France) and Martin Kolb (Hamilton, Canada)) provided an update about the current indications and potential future indications based on new molecular techniques, while at the same time, there were intriguing presentations about programmed cell death protein 1 (PD-1)/PD-1 ligand (PD-L1) data and next-generation sequencing (NGS). Celine Mascaux (Marseille, France) and Rainer G. Wiewrodt (Munster, Germany) delivered a fruitful debate about the use of PD-1 and PD-L1 testing in everyday clinical practice, highlighting how encouraging the preliminary data is for agents that go beyond the tyrosine kinase blockade of mutated epidermal growth factor receptor and rearranged anaplastic lymphoma kinase. Joanna Chorostowska-Wynimko (Warsaw, Poland) and Thomas Wehler (Homburg/Saar, Germany) presented the pros and cons of readiness of NGS use in clinical practice. NGS seems to be the future of the personalised management of lung cancer patients; however, further trials are required, and access and financial costs do not seem to be easy

to overcome. A session dedicated to molecular footprints in diagnosis and treatment of lung cancer provided updates about the potential use of stem cells in mesothelioma patients (Sam Janes; London, UK), discovery of new drugs (Anne-Marie Dingemans; Maastricht, the Netherlands) and use of novel biomarkers (Torsten Blum; Berlin, Germany).

Concluding remarks

Overall, this year's ERS International Congress has proven to be the place where science, clinic education and lifestyle meet. We would like to invite especially those ECMs who have never attended the ERS International Congress before to join us in Milan next year.

Unfortunately, we had not received contributions from Assembly 4 or 8 at the time of print. However, symposia in these fields were highly attended by ECMs. If you are an ECM from either assembly and would like to get involved with contributions to future articles, please contact your ECMC representative.

Conflict of interest

None declared.