

Early View

Original article

ERS International Congress 2020: Highlights from the General Pneumology Assembly

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ERS International Congress 2020:

Highlights from the General Pneumology Assembly

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Abstract

The European Respiratory Society accepted 4062 abstracts for presentation at the International Congress in 2020. Though the conference was held virtually making it possible to replay presentations, it remains a challenge to keep abreast of all the clinical and scientific advances. Therefore, this article provides highlights from the General Pneumology Assembly. Selected presentations from rehabilitation and chronic care, general practice and primary care, M-health and E-health are summarised. This review incorporates novel findings from laboratory-based science, randomised controlled trials and qualitative research together with insights from newly available clinical guidelines.

Short abstract

Highlights from the @EuroRespSoc General Pneumology Assembly presented during #ERSCongress 2020

Introduction

With travel restrictions and social distancing the norm for much of the year due to coronavirus disease (COVID-19), the European Respiratory Society International Congress, held virtually in September 2020, provided a much valued opportunity to come together. As the world's largest scientific and educational conference for respiratory medicine, the congress provided an excellent chance to hear the latest developments in research and clinical practice with 4062 abstracts accepted for presentation. The General Pneumology Assembly is the largest of the 14 Assemblies within the European Respiratory Society. Across the four groups within the Assembly, 346 abstracts were presented in 22 sessions. Though the virtual platform allowed presentations to be replayed, it can be difficult to keep up to date with all of the scientific and clinical advances on offer. Therefore, in this review we aim to share some of the highlights arising from the General Pneumology Assembly.

Pulmonary rehabilitation and chronic care

Session: Best abstracts in pulmonary rehabilitation and chronic care

A peer review of abstracts submitted to the European Respiratory Society Congress in the field of pulmonary rehabilitation and chronic care led to the selection of the six most innovative and interesting works, presented by their authors in the traditional session: "Best abstracts in pulmonary rehabilitation and chronic care". Works selected this year covered key topics including cellular

mechanisms of muscle regeneration, effects of high-flow oxygen supplementation during exercise in Chronic Obstructive Pulmonary Disease (COPD) and interstitial lung disease, the efficacy of new exercise training strategies for COPD patients and effects of a behavioural change intervention on asthma symptoms.

To investigate the cellular basis of reduced efficacy of exercise training in peripheral muscles in COPD patients, Pomiès et al.^[i] used in vitro Electrical Pulse Stimulation (EPS) of cultured human myotubes from nine healthy subjects and nine COPD patients. Compared to myotubes from healthy subjects, after a 24 hours EPS protocol at 1 Hz and 11.5 V, myotubes from COPD patients appeared atrophied, had reduced cellular differentiation and regeneration, and impaired protein synthesis and oxidative metabolism adaptation. This in vitro altered response to EPS could reflect impaired regenerative capacities of satellite cells, accounting for a lack of muscle adaptation capacity and the limited effects of in vivo exercise training in COPD patients.

In the same research area of muscle repair and regeneration, Sancho Muñoz et al.^[ii] investigated the role of negative regulator myostatin as a possible inhibitor of muscle regeneration in sarcopenic COPD patients. Compared to control subjects and COPD patients with normal body composition, sarcopenic COPD patients had a reduction in quadriceps muscle strength, higher myostatin protein levels, increased activated satellite cells, hybrid fibres and TUNEL-positive cells count. Muscle fibre area and expression of muscle regeneration markers was also lower than in controls. The authors suggested that an increased expression of myostatin may have interfered with muscle cell proliferation during the regeneration process in COPD patients with sarcopenia, thus leading to poor muscle growth following injury and muscle mass loss.

The effects of high flow nasal cannula (HFNC) for oxygen supplementation during exercise were analysed in two selected abstracts. Generating high humidified airflow with constant oxygen fraction, HFNC allows for a decrease in oxygen dilution in the dead space of the airway. Thus, HFNC generates positive pressure, improves oxygenation, reduces the respiratory rate and contributes to greater comfort in acute respiratory failure.^[iii] In a randomised crossover study, Sanguanwong et al.^[iv] compared the effects of supplemental HFNC, oxygen cannula and without oxygen (control group) during exercise in 13 COPD patients with exercise-induced desaturation. Subjects were assigned to wear HFNC (60 litres per minute, Fraction of inspired oxygen (FiO₂) 0.4), oxygen cannula (6 litres per minute) or no oxygen supplement during a cycle ergometer constant work rate exercise testing, set at 70% of peak work rate. Endurance exercise time, dyspnoea and time to desaturation improved with HFNC and oxygen cannula, with no superiority of HFNC compared to oxygen cannula. Arizono et al.^[v] assessed the effect of HFNC therapy on exercise capacity in 20 patients following an exacerbation of interstitial lung disease. This prospective, single-blind, randomised trial compared the efficacy during exercise of two different concentrations of oxygen for HFNC: high (FiO₂: 60%, 40 litres per minute) and low oxygen concentration (FiO₂: 25.1±6.7%, 40 litres per minute). During a constant work-rate exercise test (20 W) 9 days after the exacerbation, high oxygen concentration, HFNC significantly increased the endurance time and minimum oxygen saturation whilst heart rate and respiratory rate were decreased compared with low oxygen, suggesting high concentration of oxygen for HFNC benefits exercise capacity.

One of the most relevant challenges in pulmonary rehabilitation (PR) and chronic care is how to induce a sustained change in patient's lifestyle to maintain the beneficial effects of PR and improve

control of symptoms and quality of life. Because improvement in physical activity levels and sleep quality may be related to asthma control in adults, Passos et al.^[vi] conducted a randomised-controlled trial to investigate whether a behavioural change intervention could improve physical activity levels and sleep quality in moderate to severe asthma patients. The intervention group followed the same usual care and educational programme of the control group, but with the addition of an 8-week behavioural change intervention focused on goal-setting and positive feedback. All subjects were assessed on sleep quality (Actisleep, Pittsburgh and Berlin questionnaire), physical activity levels (GT9X accelerometer), asthma symptoms (daily diary) and psychosocial symptoms. A significant improvement in the intervention group was observed in sleep efficiency and latency, depression symptoms, physical activity levels and the number of asthma-symptom-free days compared to the control group. The authors suggested that beneficial effects of the behavioural change intervention on asthma control and psychosocial symptoms were mediated by the increase in physical activity levels and sleep quality.

To increase adherence to PR programmes, alternative approaches to conventional programmes have been proposed, focusing on group activities and participation in immersive and engaging social and physical activity. Singing for Lung Health was recently proposed by the British Lung Foundation as a group activity tailored to people with respiratory disease (particularly those with airflow obstruction) and focused on improving breath control and posture using songs.^[vii] Lung choirs have shown to improve respiratory control and wellbeing but the impact on physical capacity was unclear. Kaasgaard et al.^[viii] conducted a multi-centre randomised-controlled trial to evaluate effectiveness of singing training in increasing physical capacity, compared to usual physical training. Singing training was as efficacious as physical training in improving physical capacity and superior for improving quality of life. Whereas this study confirmed singing training as a promising strategy for physical training, no differences were found in symptom control or adherence, suggesting the need for further efforts to standardise the content of singing training to provide evidence-based recommendations.

General Practice and Primary care

Session: Primary care day and diagnosis and management of airways disease in primary care

The European Respiratory Society 2020 congress offered much for participants interested in primary care respiratory medicine. Highlights from the primary care day and the diagnosis and management of airways disease in primary care sessions are presented.

Diagnosis of asthma or COPD can be difficult and has been more challenging during the COVID-19 pandemic. As a heterogenous disease with different phenotypes^[ix] and no 'gold' standard test that can confirm or refute the diagnosis in every situation, mis-diagnosis of asthma is common.^[x, xi] Professor Mike Thomas emphasised the importance of gaining objective evidence for an asthma diagnosis rather than relying on a symptoms alone. In COPD, spirometry is the key diagnostic test,^[xii] but as Dr Miguel Roman Rodriguez highlighted, there are barriers to confirming the diagnosis meaning many cases of COPD remain undiagnosed.^[xiii] COVID-19 has brought new challenges for

diagnostic assessment, principally due to reduced lung physiology services in many countries.^[xiv] Until laboratory-based testing becomes available again, alternative options might include peak expiratory flow, portable spirometers and exhaled nitric oxide monitors, and smart phone technologies.^[xiv]

In asthma management, overuse of short-acting beta2-agonist (SABA) inhalers is associated with poor clinical outcomes [ix] including an increased risk of asthma attacks, emergency department visits ^[xv] and mortality.^[xvi] In their study of 70 patients who presented to the emergency department with an asthma attack, Barmparessou *et al.*^[xvii] identified that most individuals had 'mild' asthma, and 27% were treated only with a SABA. To reduce SABA over-prescribing in the UK, electronic prescribing alerts were introduced in general practices. McKibben *et al.*^[xviii] found clear discrepancy between how clinicians, experts and guidelines defined excessive SABA use. The volume of warnings and other work pressures meant that SABA alerts were often ignored.^[xviii]

One intervention known to reduce emergency department attendances is supported self-management for asthma.^[xix] Asthma action plans can be effectively tailored for different cultural groups,^[xix] but the influence of limited health literacy on self-management needed further exploration. By conducting a qualitative study of 26 participants recruited from Malaysian primary care, Salim *et al.*^[xx] found poor understanding of asthma led to limited acceptance of the condition and treatment resulting in poor asthma control. Supporting people with limited health literacy to understand their condition was recommended for developing good self-management.^[xx]

Helping women with asthma during pregnancy was discussed by Professor Vibeke Backer who highlighted guidance from the European Respiratory Society/ Thoracic Society of Australia and New Zealand task force.^[xxi] In comparison to non-asthmatic women, females with asthma have on average, a longer time to pregnancy and become pregnant less often.^[xxii] When considering asthma medication use during pregnancy, inhaled therapies, oral corticosteroids and most antihistamines were considered without serious side effects.^[xxi] The main aim should be to prevent exacerbations, as events which lead to lower maternal oxygenation are more harmful for the (unborn) child than the potential side effects of medication. Currently, few studies were available to inform the use of biologic therapies during pregnancy, however monoclonal antibodies were considered unlikely to cause harm to the foetus and on balance should be continued during pregnancy if needed to control the mother's asthma.^[xxi]

The remaining talks considered how primary care clinicians can best support individuals with respiratory disease that often result from, or co-exist with, other conditions. Individuals with COPD often have multiple co-morbidities affecting their health and prognosis.^[xii, xxiii] Co-morbidities in COPD often occur in clusters which suggests common risk factors and shared disease processes.^[xxiv] Dr Ioanna Tsiligianni highlighted the International Primary Care Respiratory Group desktop helper for COPD and multimorbidity, recommending a holistic approach; identifying and treating comorbidities, screening for co-existing anxiety or depression and evaluating the indications and possible side effects of inhaled therapies.^[xxv] One important co-morbidity of COPD which carries a poor prognosis is pulmonary hypertension.^[xxvi] Defined by a mean pulmonary artery pressure of more than 25 mmHg, pulmonary hypertension may arise as a complication of many cardiovascular and respiratory diseases but can be difficult to identify as right heart failure occurs in the later stages of disease.^[xxvi] To achieve a timely diagnosis (and better clinical outcomes), Professor Anton Vonk

Noordegraaf recommended being alert to the primary symptom of exercise intolerance, especially in younger patients (aged 30-55), and instigating further assessment with N-terminal pro-brain natriuretic peptide (NT-proBNP), electrocardiogram and echocardiography.[xxvi]

Despite the restrictions due to COVID-19, the (virtual) European Respiratory Society congress provided opportunities to learn, discuss, share research and experiences from across the world, and connect with one another, making the primary care sessions this year particularly valuable and stimulating.

M-health/E-health

Session: Digital technologies in airway diseases

Growing interest of the European Respiratory Society in digital medicine interventions resulted in an oral presentation session organised by Group 1.4 M-Health/e-health dedicated to the use of modern technologies in management and treatment of airway diseases. In this rapidly changing world, healthcare workers are facing new challenges: How can we use new technologies to improve our healthcare system? How can we ensure that technologies are adopted and useable rather than leaving people baffled? At the same time, respiratory patients are extremely interested in how they can optimally benefit from innovative technologies. The session “Digital technologies in airway diseases” provided participants with different solutions to these questions.

Feedback from patients

When dealing with digital technologies, it is important always to put the needs and preferences of patients first. In this regard, Sont et al.[^{xxvii}] and Metting et al.[^{xxviii}] reported on feedback they gathered from patients who had tried digital monitoring systems. Sont et al.[xxvii] organised focus groups for patients with asthma to explore their attitudes towards mHealth applications. Improving disease outcomes, reducing consultations and improving disease awareness were all identified as potential goals. Ineffectiveness, time-consumption, privacy issues and information overload were the most important perceived barriers. Interestingly, patients had divergent opinions on the required functions of an mHealth system, suggesting that these systems should be personalised to their individual needs. Metting et al.[xxviii] developed a monitoring system in the Horizon 2020 Connecare study to coordinate care around chronically ill patients. The system consisted of a dashboard for healthcare providers and an app for patients. The authors elaborated on the lessons learned from the feedback provided by 46 COPD patients. Most of these patients highlighted the ease of use of the chat function. In addition, the authors emphasised the importance of personalisation and including all stakeholders in the development of a monitoring system.

Remote healthcare

Telemonitoring of vital signs and parameters from patients is a well-known way to use digital technologies. However, telemonitoring could also be used for helping patients at a distance. Cumella et al.[^{xxix}] showed that a WhatsApp service can reach an otherwise unengaged younger audience of asthma patients. Patients could reach healthcare providers through WhatsApp and in response, they received advice, links, video content or infographics from healthcare providers. A post-chat online

survey of 669 patients with asthma showed the service was well perceived and almost two thirds of the patients had more confidence in managing their asthma symptoms after using the service. Adejumo et al.^[xxx] performed a randomised controlled pilot study with 36 asthma patients to assess whether feedback about inhaler use could affect adherence and clinical outcomes. Inhaler use was monitored with an electronic monitoring device for both intervention and control groups. Only the intervention group received monthly feedback and an app showing their day-to-day inhaler use. A trend towards higher adherence for the intervention group was identified, whereas no changes in clinical outcomes were observed.

Exacerbation prediction

One of the most common goals of digital technologies for patients with chronic airway diseases is the prediction of exacerbations and the reduction of hospitalisations. Janson et al.^[xxxii] developed a machine learning model to predict the immediate risk of asthma exacerbations. Data from electronic medical records and national registries of almost 30 000 asthma patients were used to predict whether they would exacerbate in the next 15 days. The model indicated that the Charlson Comorbidity index and previous exacerbations were the main factors influencing the risk of exacerbations in these patients, though was not sufficiently accurate to be used in clinical practice. Therefore, the authors concluded that supplemental data (e.g. pollution, pollen count, information from mHealth devices) were needed to develop a more clinically useful tool. The eHealth intervention (EmmaCOPD) presented by Kasteleyn et al.^[xxxiii] managed to reduce the total number of exacerbations and hospitalisation days among COPD patients. EmmaCOPD consisted of an app to answer symptom questionnaires and a smart watch with a step counter. Depending on the answers to the questionnaires, the 29 included patients with COPD were assigned to a green, yellow, orange or red zone. The system provided patients with the advice to call a healthcare provider when they entered the orange or red zone. As a result, EmmaCOPD reduced the total number of exacerbations and hospitalisation days, while additional work for healthcare providers was kept to a minimum.

Overall, the session highlighted the most important cases of digital technologies for patients with airway diseases from different countries and improved our understanding of how we should build future healthcare systems.

Concluding remarks

The General Pneumology Assembly of the European Respiratory Society offers a wide range of clinical and scientific research, as is evident in this summary. Given the size of the congress, it can be hard to keep abreast of new developments, even using a virtual platform. Therefore, we hope the highlights from the assembly summarised in this article, will allow readers to keep up to date with the latest research, revisit topics of interest and provide encouragement to take part in the European Respiratory Society International Congress in 2021 to be held in Barcelona.

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