XII INTERNATIONAL WORKSHOP ON LUNG HEALTH

INNOVATIVE MEDICINE

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ABSTRACT BOOK

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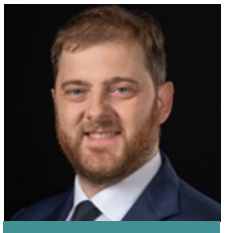

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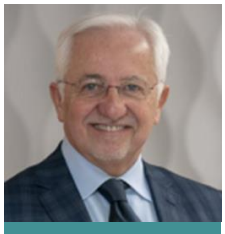

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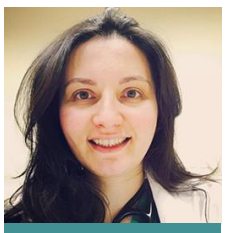

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RISING STARS

The abstracts are listed in the order of presentation on the scientific program

[22] Targeting PI3K with a novel synthetic peptide to modulate cAMP in

Category: Rising Star

Session: 16/01/2025 (14:40-15:30) - SESSION I: RISING STARS

Angela Della Sala[1]; Laura Tasca[1,2]; Cosmin Butnarasu[1]; Valentina Sala[1,2]; Giulia Prono[1]; Enrico Millo[3]; Francesco Blasi[4,5]; Andrea Gramegna[4,5]; Stefano Aliberti[6]; Alberto Massarotti[7]; Sonja Visentin[1]; Emilio Hirsch[1,2]; Alessandra Ghigo[1,2]

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Background/Aims: A-kinase anchoring proteins (AKAPs) are key orchestrators of cyclic AMP (cAMP) signaling that act by recruiting protein kinase A (PKA) in proximity of its substrates and regulators to specific subcellular compartments. Modulation of AKAPs function offers the opportunity to achieve compartment-restricted modulation of the cAMP/PKA axis, paving the way to new targeted treatments. For instance, blocking the AKAP activity of PI3Kγ improves lung function by inducing cAMP-mediated bronchorelaxation, ion transport and anti-inflammatory responses. Here, we report the generation of a non-natural peptide, DRI-Pep #20 (Patent pending n. 102023000025458), that acted as a potent disruptor of the PI3Kγ/PKA complex by mimicking the core of the native interaction of PI3Kγ with PKA.

Methods: Structural predictions and molecular docking studies were performed to identify the interactions with the PKA regulatory subunit-α, specifically targeting the known AKAP binding site. Biochemical assays were conducted to evaluate the effect of the peptide on cAMP levels both *in vitro* (16HBE14o- and CFBE41o- cells) and *in vivo* (following intratracheal administration in mice). Given the challenges of drug delivery to diseased lungs, characterized by high levels of proteases, like neutrophil elastase, and thick mucus

layers, the peptide's resistance to proteolytic degradation and bioavailability in patient-derived mucus models were evaluated.

Results: We found that DRI-Pep #20 can adopt an α-helical conformation and directly bind to PKA demonstrating nanomolar binding affinity, confirmed through fluorescence and stopped-flow techniques. DRI-Pep #20 effectively triggers cAMP elevation both *in vivo* in mice and *in vitro*, enhancing the function of the cAMP-operated channel CFTR. Notably, DRI-Pep #20 remains localized in the lungs after delivery, avoiding undesired cAMP elevation in other tissues like the heart. The peptide is also highly stable in the presence of neutrophil elastase and permeates the pulmonary mucus barrier, suggesting potential utility in airway diseases such as COPD, certain forms of asthma, non-CF bronchiectasis (NCFB), and cystic fibrosis (CF). In CF bronchial epithelial cells, DRI-Pep #20 boosts the efficacy of standard CFTR modulators (Elexacaftor/Tezacaftor/Ivacaftor), improving the function of the common CFTR mutant, F508del. Furthermore, its ability to activate the wild-type CFTR channel suggests potential therapeutic applications for non-genetic conditions with acquired CFTR dysfunction, including COPD, non-atopic asthma, and NCFB.

Conclusions: Overall, the study unveils DRI-Pep #20 as a potent PI3Kγ/PKA disruptor, demonstrating unprecedented binding affinity and potency. Its resistance to protease degradation and ability to penetrate airway mucus highlight its potential to increase therapeutic cAMP levels in chronic respiratory conditions where mucus accumulation and inflammatory remodeling remain significant unmet medical needs.

Conflict of interest(s) (if any – not included in the 500 words):

Alessandra Ghigo and Emilio Hisch are cofounders and shareholders of Kither Biotech Srl. Valentina Sala and Laura Tasca are employees of Kither Biotech Srl. All other authors report no conflict.

[32] Adult-Onset asthma linked to reduced cerebral white matter: a mendelian randomization study

Category: Rising Star

Session: 16/01/2025 (14:40-15:30) - SESSION I: RISING STARS

Subhabrata Moitra[1]; Patel Saloni[1]; Garud Arundhati[1]; Jha Chetkar[1]; Bandyopadhyay Arghya[2]; Moitra Saibal[3]

[1]*Ahmedabad University, Ahmedabad, India;* [2]*University of Kalyani, Kalyani, India;* [3]*Apollo Multispeciality Hospitals, Kolkata, India*

Background/Aims: Numerous observational studies have shown significant associations between asthma and neurological conditions such as Alzheimer's disease and Parkinson's disease. These neurological conditions are primarily linked to motor neuron dysfunction, which may be driven by degeneration of neuronal projections and demyelination in the cerebral cortex. However, despite these potential associations, a clear causal relationship between asthma and cerebral white matter volume has yet to be established as most findings were based on cross-sectional studies, which were limited by reverse causality bias and various confounding factors. Additionally, there is a lack of studies that differentiate between adult-onset and childhood asthma. To address this gap, we conducted a two-sample Mendelian randomization (MR) study to explore the causal relationship between adult-onset and childhood asthma, and cerebral white matter volume from a genetic perspective.

Methods: We selected adult-onset and childhood asthma as the primary exposures from the genome-wide association study (GWAS) conducted on the UK Biobank, which included 341,215 individuals of European descent. The outcome variables were the cerebral white matter volumes in the left and right hemispheres, obtained through sub-cortical volumetric segmentation from a recent GWAS of brain imaging phenotypes involving 31,968 individuals from the UK Biobank. For analysis, we employed the random-effects inverse-variance weighted (IVW) method as the main approach, complemented by weighted median, weighted mode, and MR-Egger analyses. As part of our sensitivity analysis, we assessed for horizontal pleiotropy, with a P-value greater than 0.05 indicating no potential pleiotropic effects. To reduce the impact of individual differences, the brain imaging data were adjusted for population principal components provided by the UK Biobank, as well as for confounding factors such as age, head size, and sex.

Results: We found 45 single nucleotide polymorphisms (SNPs) linking cerebral white matter with adult-onset asthma and 100 SNPs with childhood asthma after using a significance threshold of $P<5\times10^{-8}$. The analyses showed that adult-onset asthma was significantly

associated with reduced white matter volume in both the right (IVW β: -0.004; 95% confidence interval [CI]: -0.007 to -0.001; P=0.005) and left (IVW β: -0.005; 95% CI: -0.007 to -0.002; P=0.002) hemispheres. However, we found no associations between childhood asthma and white matter volume in either hemisphere (IVW β: -0.0003; 95% CI: -0.003 to 0.002; P=0.79). Additionally, we did not observe any directional pleiotropy regarding the associations between adult-onset or childhood asthma and cerebral white matter volume, as all P-values for intercepts were greater than 0.10.

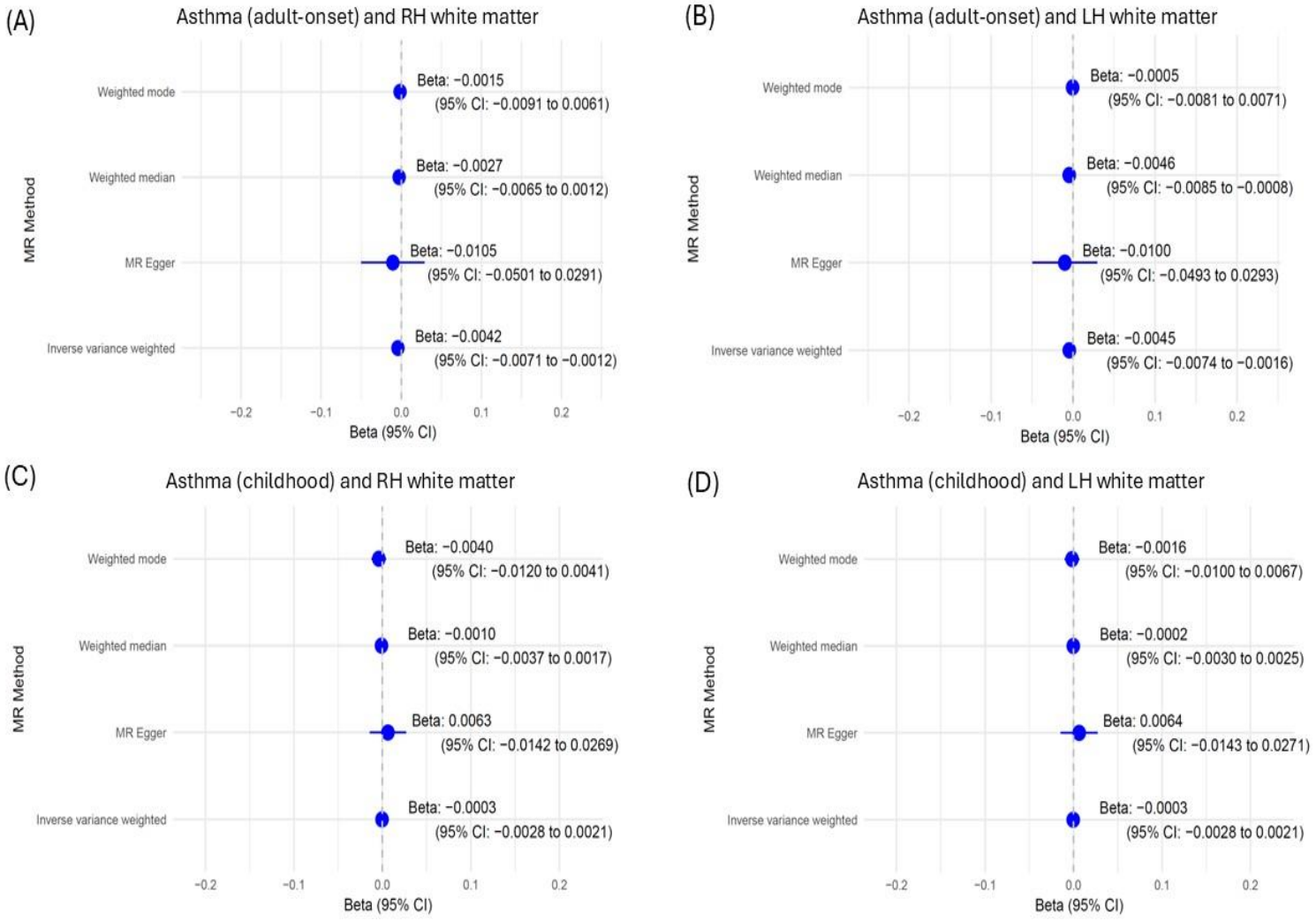

Figure: Mendelian randomization estimations showing the causal association between adult-onset asthma and right (A) and left (B) cerebral white matter volume, and childhood asthma and right (C) and left (D) cerebral white matter volume.

Conclusions: Our findings suggest a causal relationship between adult-onset asthma and the volume of cerebral white matter in the brain. This research not only enhances our understanding of how asthma-related inflammation can affect the brain's structure but also indicates potential long-term impacts on cognitive function and neurological health. Furthermore, our study sheds light on a possible genetic connection between chronic respiratory diseases, such as asthma, and neurological conditions, emphasizing the need for further investigation into the interplay between these health issues. This understanding could lead to more effective interventions and treatments for individuals suffering from both respiratory and neurological disorders.

ORAL COMMUNICATIONS

The abstracts are listed in the order of presentation on the scientific program

[65] CFTR variants: prevalence and clinical implications in Bronchiectasis

Category: Oral Communication

Session: 18/01/2025 (11:30-12:30) - SESSION VII: ORAL COMMUNICATIONS

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Background and objective. Bronchiectasis (BE) is a chronic lung disease characterized by chronic respiratory symptoms associated with a permanent dilatation of the bronchi. Cystic fibrosis (CF) is a common cause, affecting clinical outcomes and quality of life. This study investigated the prevalence of CFTR variants in people with bronchiectasis and their clinical implications. The study aimed to understand the role of CFTR dysfunction in this group.

Methods. We performed a multicentric study including patients with BE that underwent regular followup in two tertiary clinics in Milan, Italy, from September 2017 to September 2024. Individuals underwent extensive CFTR gene sequencing and classified according to the CFTR2database. Pulmonary function tests, chronic infections, BSI, and mMRC were assessed. Sweat chloride concentrations were measured to determine CFTR function. The prevalence of CFTR variants in adults with BE was compared with that of a control group of blood donors.

Results. The study included 454 adults with BE and 250 individuals in the control group. Among those with BE, 182 individuals (40.1%) carried at least one CFTR variant, with 40 (8.8%) identified as having a CF-causing variant: This prevalence was higher than that observed in the control group (n=23, 24%). The odds ratio of carrying a CF-causing variant among adults with BE was 2.81 (95% CI: 1.37-5.75, *p*= 0.005). However, no significant correlation was found between CFTR carrier status and clinical outcomes, including lung function or bronchiectasis severity.

Conclusions: Our results suggest that while CFTR variants are more prevalent in adults with BE, their clinical impact requires further exploration. This study underscores the importance of genetic counseling and the need for prospective evaluations to ascertain the benefits of systematic CFTR screening and the potential application of CFTR-modulating therapies in this population.

[43] Significant Withdrawal Effects of LAMA and ICS in COPD: A Real-World Challenge Amid Low Treatment Adherence

Category: Oral Communication

Session: 18/01/2025 (11:30-12:30) - SESSION VII: ORAL COMMUNICATIONS

Alexander Mathioudakis[1,2]; Bate Sebastian[3,4]; Chatzimavridou-Grigoriadou Victoria[5]; Sivapalan Pradeesh[6,7]; Jensen Jens-Ulrik Stæhr[6,7]; Bakerly Nawar Diar[8]; Vestbo Jørgen[1,6]; Singh Dave[1,9]

[1]*Division of Immunology, Immunity to Infection and Respiratory Medicine, The University of Manchester, Manchester, United Kingdom;* [2]*North West Lung Centre, Manchester University NHS Foundation Trust, Manchester, United Kingdom;* [3]*Manchester Academic Health Science Centre, Research and Innovation, Manchester University NHS Foundation Trust, Manchester, United Kingdom;* [4]*Centre for Biostatistics, Division of Population Health, Health Services Research and Primary Care, University of Manchester, Manchester, United Kingdom;* [5]*Department of Endocrinology, University of Manchester, School of Medical Sciences, Manchester, United Kingdom;* [6]*Department of Medicine, Section of Respiratory Medicine, Copenhagen University Hospital, Herlev and Gentofte, Copenhagen, Denmark;* [7]*Department of Clinical Medicine, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark;* [8]*Respiratory Medicine, Salford Royal Hospital, Northern Care Alliance NHS Foundation Trust, Salford, United Kingdom;* [9]*Medicines Evaluation Unit, Manchester University NHS Foundation Trust, Manchester, United Kingdom*

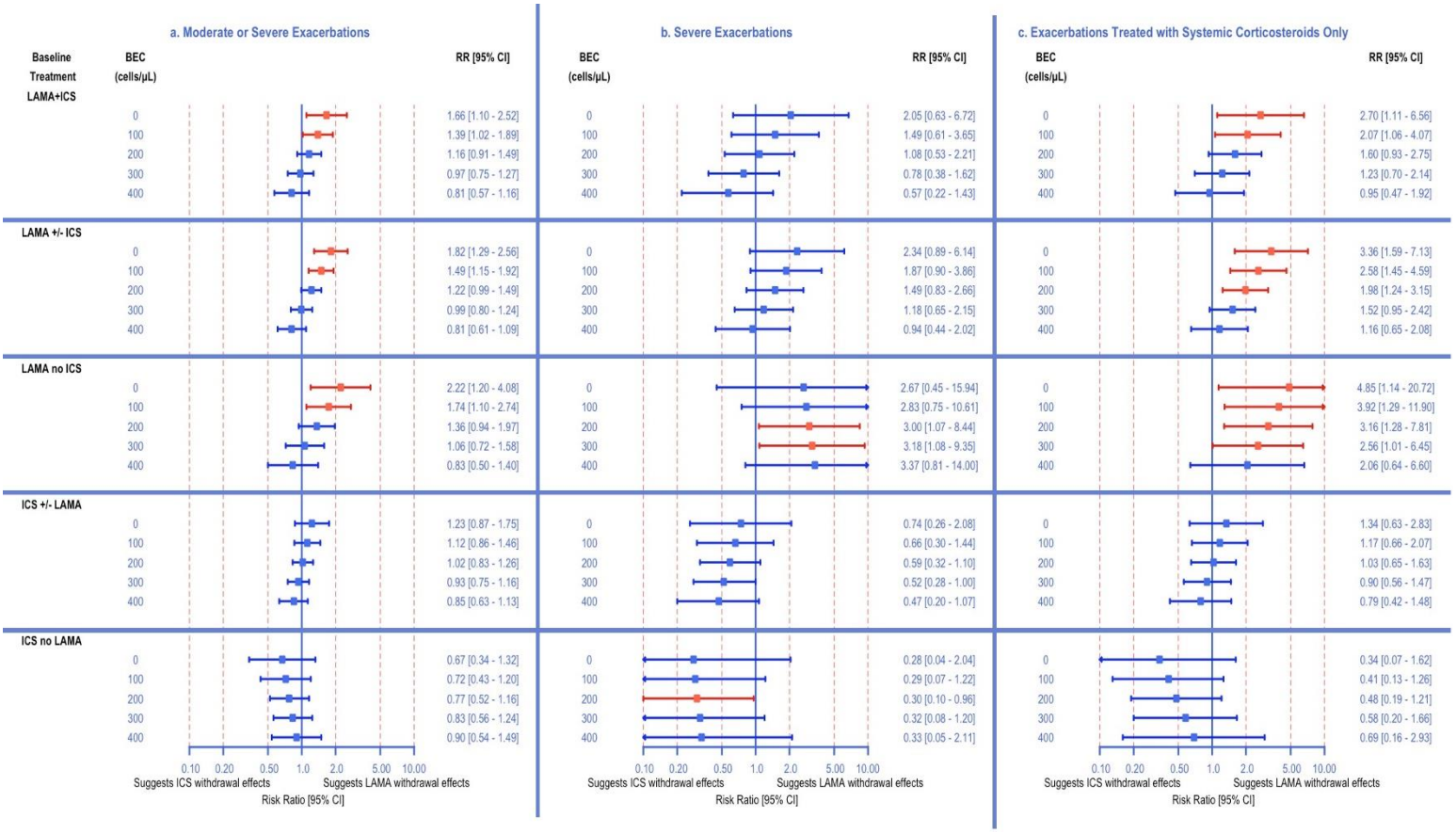
Background/Aims: Adherence to inhaled therapies in COPD is suboptimal, with frequent cycles of treatment initiation and discontinuation observed in real-world settings. Discontinuing inhaled corticosteroids (ICS) may trigger a withdrawal effect, causing a paradoxical increase in exacerbations beyond expected disease progression. Data on withdrawal effects after discontinuing long-acting muscarinic antagonists (LAMA), are lacking. In this post-hoc analysis, we investigated, for the first time, the potential treatment withdrawal effects of LAMA in the FLAME population, while also further examining previously described ICS withdrawal effects.

Methods: The FLAME trial, a 52-week, double-blind, non-inferiority RCT compared LABA+LAMA to LABA+ICS in patients with COPD, moderate-to-severe airflow limitation, and at least one exacerbation in the prior year. Here, we explored ICS and LAMA withdrawal effects on exacerbations. Patients were stratified by baseline ICS/LAMA use, and exacerbation outcomes were assessed using multivariable regression analyses, accounting for the interaction between treatment effects and blood eosinophils. We explored between-

group differences in treatment effects in the first versus later follow-up trimesters. An increased burden of exacerbations in the LABA+ICS versus LABA+LAMA arm in the first compared to subsequent trial trimesters among participants that were receiving LAMA at baseline was considered indicative of LAMA treatment withdrawal effect. Similarly, an increased burden of exacerbations in the LABA+LAMA versus LABA+ICS arm in the first compared to subsequent trial trimesters among participants that were receiving ICS at baseline was considered indicative of ICS treatment withdrawal effect.

Results: Multivariable regression analyses revealed significant withdrawal effects of LAMA on moderate/severe, presumed non-infective, and presumed infective exacerbations with a consistent trend for severe exacerbations. ICS discontinuation led to a short-term spike in severe exacerbations. Figure 1 summarises between treatment differences in exacerbation rates during the first versus subsequent trial trimesters, stratified by baseline treatments and baseline blood eosinophil count (BEC). When comparing the first trimester with subsequent trimesters after LAMA discontinuation, the between-treatment (LABA+ICS versus LABA+LAMA) difference in moderate/severe exacerbations was exaggerated by a risk ratio of 2.22 [95% confidence intervals: 1.20-4.08] for baseline BEC of 0 cells/μL and 1.74 [1.10-2.74] for BEC of 100 cells/μL. In patients with higher BEC, potential withdrawal effects were concealed due to higher ICS efficacy.

Conclusions: Our findings indicate that both LAMA and ICS have a potential treatment withdrawal effect on exacerbations, that needs to be prospectively validated. These findings emphasize the critical role of monitoring treatment adherence at every clinical visit and increasing awareness among both patients and healthcare professionals about the risks associated with intermittent use of maintenance COPD therapies. Finally, our study highlights the importance of accounting for potential withdrawal effects when evaluating treatment efficacy or effectiveness in clinical research.


a. Moderate or Severe Exacerbations
b. Severe Exacerbations
c. Exacerbations Treated with Systemic Corticosteroids Only
Baseline Treatment
BEC (cells/μL)
RR [95% CI]
LAMA+ICS
0 1.66 [1.10 - 2.52] | 0 2.05 [0.63 - 6.72] | 0 2.70 [1.11 - 6.56]
100 1.39 [1.02 - 1.89] | 100 1.49 [0.61 - 3.65] | 100 2.07 [1.06 - 4.07]
200 1.16 [0.91 - 1.49] | 200 1.08 [0.53 - 2.21] | 200 1.60 [0.93 - 2.75]
300 0.97 [0.75 - 1.27] | 300 0.78 [0.38 - 1.62] | 300 1.23 [0.70 - 2.14]
400 0.81 [0.57 - 1.16] | 400 0.57 [0.22 - 1.43] | 400 0.95 [0.47 - 1.92]
LAMA +/- ICS
0 1.82 [1.29 - 2.56] | 0 2.34 [0.89 - 6.14] | 0 3.36 [1.59 - 7.13]
100 1.49 [1.15 - 1.92] | 100 1.87 [0.90 - 3.86] | 100 2.58 [1.45 - 4.59]
200 1.22 [0.99 - 1.49] | 200 1.49 [0.83 - 2.66] | 200 1.98 [1.24 - 3.15]
300 0.99 [0.80 - 1.24] | 300 1.18 [0.65 - 2.15] | 300 1.52 [0.95 - 2.42]
400 0.81 [0.61 - 1.09] | 400 0.94 [0.44 - 2.02] | 400 1.16 [0.65 - 2.08]
LAMA no ICS
0 2.22 [1.20 - 4.08] | 0 2.67 [0.45 - 15.94] | 0 4.85 [1.14 - 20.72]
100 1.74 [1.10 - 2.74] | 100 2.83 [0.75 - 10.61] | 100 3.92 [1.29 - 11.90]
200 1.36 [0.94 - 1.97] | 200 3.00 [1.07 - 8.44] | 200 3.16 [1.28 - 7.81]
300 1.06 [0.72 - 1.58] | 300 3.18 [1.08 - 9.35] | 300 2.56 [1.01 - 6.45]
400 0.83 [0.50 - 1.40] | 400 3.37 [0.81 - 14.00] | 400 2.06 [0.64 - 6.60]
ICS +/- LAMA
0 1.23 [0.87 - 1.75] | 0 0.74 [0.26 - 2.08] | 0 1.34 [0.63 - 2.83]
100 1.12 [0.86 - 1.46] | 100 0.66 [0.30 - 1.44] | 100 1.17 [0.66 - 2.07]
200 1.02 [0.83 - 1.26] | 200 0.59 [0.32 - 1.10] | 200 1.03 [0.65 - 1.63]
300 0.93 [0.75 - 1.16] | 300 0.52 [0.28 - 1.00] | 300 0.90 [0.56 - 1.47]
400 0.85 [0.63 - 1.13] | 400 0.47 [0.20 - 1.07] | 400 0.79 [0.42 - 1.48]
ICS no LAMA
0 0.67 [0.34 - 1.32] | 0 0.28 [0.04 - 2.04] | 0 0.34 [0.07 - 1.62]
100 0.72 [0.43 - 1.20] | 100 0.29 [0.07 - 1.22] | 100 0.41 [0.13 - 1.26]
200 0.77 [0.52 - 1.16] | 200 0.30 [0.10 - 0.96] | 200 0.48 [0.19 - 1.21]
300 0.83 [0.56 - 1.24] | 300 0.32 [0.08 - 1.20] | 300 0.58 [0.20 - 1.66]
400 0.90 [0.54 - 1.49] | 400 0.33 [0.05 - 2.11] | 400 0.69 [0.16 - 2.93]
0.10 0.20 0.50 1.0 2.0 5.00 10.00
Suggests ICS withdrawal effects
Suggests LAMA withdrawal effects
Risk Ratio [95% CI]

[67] Do COPD patients need to exhale to residual volume before inhaling a bronchodilator?

Category: Oral Communication

Session: 18/01/2025 (11:30-12:30) - SESSION VII: ORAL COMMUNICATIONS

Lisa Milani[1]; Camilla Zilianti[2]; Giuseppe Fuccia[1]; Linda Pelosi[1]; Juan Camilo Signorello[1]; Anna Casartelli[1]; Matteo Pecchiari[2]; Dejan Radovanovic[1]; Pierachille Santus[1]

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Background/Aims: Non-uniform distribution of inhaled gas within the lung, termed ventilation heterogeneity (VH), occurs in patients with lung disease as chronic obstructive pulmonary disease (COPD).

VH can be routinely and reliably assessed by different lung function tests, such as the single breath nitrogen washout test, measuring the phase III slope, closing volume to vital capacity ratio (CV/VC), closing capacity to total lung capacity ratio (CC/TLC). It was observed that VH can be modified and improved by the administration of bronchodilators, however, so far, no study has demonstrated the correlation between VH and acute response to bronchodilators, and predictors of response to BD in COPD are largely unknown. COPD patients are typically instructed to inhale bronchodilators (BD) after a full deflation to residual volume (RV). Inhaling from functional residual capacity (FRC) might reduce the amount of VH thus presumably enabling a better distribution of bronchodilator molecules.

Our aim was to assess whether VH might impact the acute response to BD when they are inhaled from FRC and RV and if there is a differential response in patients that improve their VH after BD administration.

Methods: Eleven stable COPD patients (64% males, mean forced expiratory volume in 1 second: 54% predicted) were randomized to inhale salbutamol 400 µg from RV or from FRC during two different sessions two days apart. Spirometric and plethysmographic lung volumes, specific airway resistances (sRAWtot), phase III slope during the single-breath nitrogen test (SBN2), CV and CC were assessed pre and post-BD by a dedicated software.

Results: Baseline lung volumes, VH indexes and sRAWtot were all not significantly different in the two different experimental sessions. Changes (Δ) in FEV1 were not significantly different when patients inhaled from FRC and RV (both +84 ml; P=1.000). ΔVC, ΔFEV1/VC, and ΔsRAWtot, although numerically greater when patients inhaled from FRC, were not significantly different compared with inhalation from RV. ΔRV (-613±455 vs -162±518; P=0.042) and ΔTLC (-344±418 vs -31±331 ml; P=0.033) were significantly higher when inhaling from FRC compared with RV. ΔCC and ΔCC/TLC improved more when inhaling from FRC than from RV (-637±518 ml vs 164±469 ml, P=0.033 and -60±70 vs -22±49 ml, P=0.037). In general, baseline CC/TLC was associated with ΔVC, ΔRV and ΔsRtot, but not with ΔFEV1 (Figure 1). Post-bronchodilator changes in CV with ΔFEV1, ΔVC and ΔsRtot (Figure 1). Correlation between Δlung volumes and VH was generally higher when patients inhaled from RV (Figure 1).

Conclusions: The preliminary results of our study suggest that patients might benefit more from inhaling a bronchodilator from FRC, and that bronchodilator response might be hampered by the extent of ventilation inhomogeneity. An improvement in closing volume with bronchodilation can predict bronchodilator response in terms of FEV1 and lung volumes. The inhalation from RV appears to be more subject to VH than inhalation from FRC.

[15] From neglect to numbers: The first study of Bronchiectasis in Sri Lanka's public health institutions

Category: Oral Communication

Session: 18/01/2025 (11:30-12:30) - SESSION VII: ORAL COMMUNICATIONS

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Background/Aims: Bronchiectasis prevalence is increasing globally, however, its burden in Southeast Asia has not yet been quantified. Therefore, it's crucial to fill this knowledge gap to facilitate the actions towards reducing the disease burden. Colombo; the capital of Sri Lanka has the highest number of respiratory clinic attendees in the country as it's the most populated district in the country. The aim was to determine the proportion of patients with bronchiectasis among patients attending respiratory clinics in government healthcare institutions in the Colombo District, Sri Lanka.

Methods: The proportion of bronchiectasis patients, among all respiratory clinic attendees of government healthcare institutions in Colombo District, was assessed. All the government healthcare institutions with respiratory clinics headed by a Consultant Respiratory Physicians (CRP); namely Central Chest Clinic Colombo (CCC), Colombo South Teaching Hospital (CSTH) and Sri Jayawaradenapura General Hospital (SJGH), were included in the study setting. These clinics are headed by different CRPs. Therefore, disparities in the diagnosis of bronchiectasis were possible, due to the different clinical practices of each CRP. Therefore, operational criteria were developed for clinical and radiological diagnosis of bronchiectasis, which was the basis of the operational definition of "bronchiectasis patient" to ensure the clinical homogeneity of the study sample. The modified Delphi technique was adopted to identify the criteria for clinical and radiological diagnosis of bronchiectasis.

The duration of the study was six months from November 2022 to April 2023. The study population was all adult patients attending the above clinics during the study period. The study instrument was a pretested and piloted tool; a data extraction sheet which included socio-demographic information and information on present diagnosis. Data was collected by well-trained data collectors and the analysis was done by the principal investigator using SPSS software.

Results: The proportion of bronchiectasis patients attending government healthcare institutions in the Colombo district was 4.4% (95% CI=4.1-4.7). There were 17,129 respiratory clinic attendees during the study period; out of that, 755 were patients with bronchiectasis. Of CCC attendees, 4.3% (n=588) had bronchiectasis and out of CSTH respiratory clinic 2.1% (n=65). There were 248 bronchiectasis patients (34.2%) with a duration of the disease of less than one year. The duration of the disease for more than five years was among 6.6% (n=48) of the patients. The mean age of the bronchiectasis patients attending the government respiratory clinic was 62.9 years (SD=14.1 years). The median age was 66 years (IQR=17 years), and the mode was 70 years. Sixty-seven per cent (n=489) of the patients were in the age group of 61-70 years. Only 0.7% (n=5) of the bronchiectasis patients were in the age category of more than 80 years. Among bronchiectasis patients attending government respiratory clinics in the Colombo district, 54.9% (n=399) were females.

Conclusions: The proportion of bronchiectasis patients in healthcare institutions was 4.4%, higher than in other countries; therefore, policymakers and healthcare providers need to focus on ensuring service provision for these patients.

[66] Sustainability in Lung Health: What do Medical Students Know?

Category: Oral Communication

Session: 18/01/2025 (11:30-12:30) - SESSION VII: ORAL COMMUNICATIONS

Areen Tawil[1]

[1]*University of Plymouth, Plymouth, United Kingdom*

Background/Aims: Inhalers account for a significant portion of the healthcare sector's carbon emissions due to the hydrofluorocarbon propellants they contain. Starting patients on more sustainable inhaler options, such as dry powder inhalers, if clinically appropriate is an essential target to help us meet our global goals on sustainability.

This study aims to assess medical students' knowledge, perceptions and educational exposure regarding inhaler sustainability.

Methods: This was a cross sectional study in the form of an online form sent to UK medical students. The form had 14 questions and there were 43 respondents.

Results: Responses were collected from 43 medical students. Regarding the NHS's carbon footprint from inhalers, responses varied, with most students overestimating the impact. Thirty-six students (83.7%) had never encountered patients interested in sustainable inhaler options, and 35 (81.4%) reported that inhaler sustainability was not covered in their curriculum. Perceptions of the importance of inhaler sustainability varied: four rated it as 5/5, eight as 1/5, and the majority between 2/5 to 4/5. Only 6 (14%) felt knowledgeable about low-impact inhaler options, while 37 (86%) did not.

Regarding HFC awareness, 36 students (83.7%) knew what HFCs are, and 36 (83.7%) believed sustainability should influence inhaler selection. Twenty-nine students (67.4%) felt that transitioning to sustainable inhalers should be a priority, but 21 (48.8%) anticipated patient resistance. Most students (31, 72.1%) expressed a likelihood of incorporating inhaler sustainability discussions in their future practice, and 28 (65.1%) were interested in additional training on environmentally friendly inhaler options.

Conclusions: The findings indicate a gap in medical students' knowledge of inhaler sustainability, despite a general awareness of the environmental impacts of HFCs. There is limited exposure to sustainability topics in current medical curricula, and many students express a desire for further training. Integrating inhaler sustainability into medical education could support future healthcare providers in making environmentally conscious choices and engaging patients in sustainability discussions. Improved knowledge and resources on sustainable inhaler options may help align clinical practice with NHS carbon

reduction goals. This research underscores the importance of educational initiatives to bridge knowledge gaps and promote sustainable prescribing practices among future clinicians.

POSTERS

The abstracts are ordered according to the numbering on the scientific program

[1] Lung on-a-chip co-culture model: a potential novel tool for cell interaction mechanistic studies and drug screening in humans

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session I - Asthma & COPD

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Background/Aims: Most 3D *in vitro* models fail capturing the complex structure of lung tissue and usually refer to monoculture system while catching cell-cell interaction is essential for mechanistic studies and determining therapeutic strategy effectiveness.Our aim was to develop a 3D cell co-culture model recreating the specific cell microenvironment in a more realistic system to provide better predictive models for respiratory disease modeling and drug screening.

Methods: We have used the microfluidic Chip-S1®(Emulate Inc.),consisting in two continuously perfused microchannels lined by primary human airway epithelial cells(NHBE,Lonza) in top channel and pulmonary microvascular endothelial cells(HPMEC,PromoCell) in bottom channel,separated by a flexible and highly porous poly(dimenthylsiloxane) cell-specific extracellular matrix-coated membrane,which can be stretched using the vacuum chambers along the sides to reproduce cyclic mechanical forces induced by respiratory movements(Figure1A).NHBE of two donors were seeded in 8 chips(4chips/donor) and HPMEC of one donor were seeded in all 8 chips(30µL/h).Each chip was inserted into its Pod®providing medium to the cells and allowing collecting effluent.The Pod-chip units were placed into the Zoë®culture module placed into the incubator,controlling flow rates and mechanical forces,and being connected to the Orb providing gas,air and power required by Zoë(Figure1B).Three-5days after seeding,air-liquid interface(ALI) was established by removing medium from the top channel to expose cells to air while fluid flows in the bottom channel was maintained at 30µL/h with shear stress equivalent to that experienced by endothelial cells *in vivo*.After 10-days of ALI,4%-strain of physiological stretching at 0.2Hz was applied to the cells for 48hours to mimic dynamic deformation occurring during normal breathing movements.Barrier function was determined by measuring the apparent permeability(Papp) to Dextran Cascade Blue by collecting effluent in the bottom channel before ALI(baseline),at day 10 of ALI,48hours after stretching and 2-

days later.Cells from each channel were separately collected to extract RNA(TRIzol™) and determine RNA quality and concentration(Agilent 2100-Bioanalyzer).

Results: We obtained a 3D-model with a fully differentiated airway epithelium characterized by active mucus production and cilia beating visible under EVOS microscopy,with a uniform vascular endothelium underneath.In both donors, baseline-Papp values indicated the presence of a good barrier integrity that was even stronger after 10-days of ALI.After 48hours of stretching, Papp increased slightly but remained in the range of strong barrier integrity.Three days after stretching, Papp returned to ALI values(Figure2).From both channels,we obtained a high concentration of RNA of excellent quality, as indicated by the RIN number(Figure3).

Conclusions: Using the lung-on-chip approach,we succeeded in developing a co-culture model of a fully differentiated airway epithelium in ALI with a vascular endothelium exposed to shear stress with a strong barrier integrity even during stretching and allowing obtaining good quality and quantity of RNA independently from each channel.This model can be further used as pre-clinical model for cell-cell interaction mechanistic studies and treatment efficacy testing.

[2] Association between chronic obstructive pulmonary disease (COPD) and systemic inflammation

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session I - Asthma & COPD

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Introduction: COPD is considered an inflammatory pulmonary disorder with systemic inflammatory manifestations. The aim of this study was to assess the systemic levels circulating C-reactive protein (CRP) level as a biomarker of systemic inflammation, leukocyte count, lipid profile and smoking exposure in patients with stable COPD and their correlation with the severity of the disease.
Material and methods: Cross sectional study, conducted at 220 patients with stable COPD as investigated group (IG) (age 40-75) and 58 subjects from general population without COPD as control group (CG), matched by age, gender and body mass index. All patients underwent laboratory testing and pulmonary function tests. The severity level in patients with COPD was determined according to GOLD (Global Initiative for Chronic Obstructive Lung Disease) criteria.
Results: We found statistically significant difference between mean serum CRP level in IG than CG (8.04±7.31 vs. 3.84±2.02, for Shapiro-WilkW=0,6622, p=0.00001). The Pearson correlation between leukocytes count and CRP value in stable COPD patients, compared to control group, showed statistically significant correlation (r=0.358, P=0.005, P < 0.01). We found statistically significant difference between mean leucocyte value in IG than CG (9.44±2.84 vs. 6.41.84±2.17, p=0.001). Results presented statistically significant difference between triglyceride level and GOLD stage. With decrease of FEV1(GOLD1→GOLD4), the triglycerides decreased significantly (p=0.005). There was no significant difference between IG/CG in relation to average triglycerides 1.34±0.74 vs. 1.41±0.69mmol/L (p=0.137). Results presented that with decrease of FEV1(GOLD1→GOLD4), the cholesterol level increased, but not significantly (p=0.134). There was no significant difference between IG subgroups and cholesterol level (p=0.512). Analysis in IG/CG indicated an average cholesterol 4.79±1.12mmol/L vs. 4.88±1.07, with no significant difference (p=0.51). The degree of airflow limitation in COPD patients was significantly related to smoking exposure expressed by number of pack-years (Brinkman Index), Pearson correlation, (r= -0.525, P=0.000, P < 0.01).
Conclusion: The present study confirms that circulating CRP levels and total leukocyte count are higher in stable COPD patients. Serum CRP may be regarded as a valid biomarker of low-grade systemic inflammation which is the leading point to atherosclerosis.

[3] Supraventricular heart rhythm disturbances in severe Chronic Obstructive Pulmonary Disease (COPD)

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session I - Asthma & COPD

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Background/Aims: We aimed to investigate the association between severe stage of COPD (FEV1<50%) and supraventricular heart rhythm disturbances.

Methods: Cross-sectional study, including 110 patients with stable COPD as investigated group (IG), aged 40-75 years and 26 non-COPD subjects, matched by gender, age, BMI, smoking-status, as control group (CG). Of 110 subjects as IG, in stage GOLD4 were 55(50%), and in GOLD3, 55(50%) of the IG. All study subjects underwent pulmonary evaluation, resting-ECG, 24-hour-ECG-Holter monitoring.

Results: Results presented statistically significant difference between presence of atrial fibrillation (AF) in IG 50 (45.4%) vs. CG 4(15.3%) ($p<0.05$). There was a significant linear positive correlation between AF and GOLD stage ($R=0.173$; $p<0.05$). With decrease of FEV1(GOLD3→GOLD4), the frequency of AF increased significantly. Transitory AF detected on 24-hour-ECG-Holter monitoring, was more frequent in GOLD3 20(18.1%) vs. 15(13.6%) in GOLD4, with no clinically significant difference. Sinus tachycardia was more frequent in GOLD4 than in GOLD3, 45 (40.9.6%) vs. 28(25.4%) ($p<0.05$) of the IG. Supraventricular tachycardia was more frequent in GOLD4 32(29.0%) vs, GOLD3 17(15.4%), ($p<0.05$) of the IG. Supraventricular beats were most frequent in GOLD4 and detected in 30 of 55 patients with GOLD4 stage of COPD, and in 15 of 55 patients in GOLD3 stage. Overall results presented statistically significant difference between presence of supraventricular heart rhythm disturbances in severe COPD vs. CG 0(0.0%).

Conclusions: As a conclusion, there is a need to develop strategies for screening, detection and early treatment of heart rhythm disturbances in COPD.

[4] Forced Oscillatory Technique R5-19 values correlate with spirometry FEV1/FVC in severe eosinophilic asthma patients. A Longitudinal Observational Study

Category: Poster

Session: 17/01/2025 (18:45-19:45) - Poster Session I - Asthma & COPD

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Background/Aims: Asthma is an obstructive airway disease affecting the entire bronchial tree. Severe asthma represents today a growing social and health problem (3-10% of all asthma patients). Biologic therapies can act as disease modifying agents in severe asthma. Moreover, the prevalence of small airways dysfunction (SAD) seems to increase with asthma severity. Forced Oscillatory Technique (FOT) has been described as a valid method for studying small airways. In particular, R5-19 parameter reflects SAD, although it has to be further validated in severe asthma. The aim of the study was to analyze FOT R5-19 parameter in a cohort of eosinophilic severe asthma patients naïve of biologic therapy, and to describe any correlation with spirometry data. Moreover variations of FOT R5-19 after 6 and 12 months from the introduction of biologic therapy were prospectively recorded and analyzed.

Methods: 47 severe eosinophilic asthma patients were consecutively enrolled. FOT (with focus on R5-19) together with spirometry data (dynamic and static volumes), levels of asthma biomarkers (blood eosinophils count, Fraction of Exhaled Nitric Monoxide – FeNO), number of exacerbations, Asthma Control Test (ACT) were determined at baseline (T0: patients naïve of biologic treatment) and after 6 and 12 months from the start of biologic therapy. Quantitative and qualitative variables were analyzed. Univariate and multivariate analysis were adequately performed.

Results: at baseline, a significant linear correlation was found between R5-19 and FEV1/FVC (Forced expiratory volume in 1 second/Forced Vital Capacity) values (p=0.0008). 26 (55.3%) of patients were obstructed at T0 (FEV1/FVC <0.70) regardless inhaled triple therapy and maximum standard of care. Interestingly, FOT R5-19 values were statistically more elevated in obstructed patients at T0 (Median R5-19 0.87 Kpa.s.L−1) than not-obstructed (Median R5-19 0.33 Kpa.s.L−1) (p=0.048). Although based on a limited number of observations, considering the significant linear correlation between FOT R5-19 and FEV1/FVC at baseline, the value of R5-19 that best discriminates the presence or absence of obstruction (FEV1/FVC <0.70) was identified, through the ROC-curve analysis and Youden's index identification. R5-19 optimal cut-off point was determined at 0.81 Kpa.s.L−1 (sensibility 0.58, specificity 0.76, ROC-AUC 0.67). A significant linear relationship was found between FEV1/FVC and FOT R5-19 also at T1 (6 months of biologic therapy, p=0.007) and

T2 (12 months of biologic therapy, p=0.027) regardless of the biologic drug introduced. On the contrary, no significant correlations were found at baseline and during the follow-up between any FOT parameters and blood eosinophils count, FeNO, number of exacerbations and ACT.

Conclusions: In conclusion, these data seem to suggest that FOT R5-19 values correlate with the traditional spirometry parameter FEV1/FVC and their values are significantly more elevated in obstructed patients. This correlation could be explained considering the higher resistances of small airways in obstructed patients. These are preliminary results on a limited number of subjects which might be the basis for future multicentric studies on the potentiality of FOT.

[5] Delineation of the molecular mechanisms underlying TSLP-driven non-type 2 inflammatory responses in severe asthma.

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session I - Asthma & COPD

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Background/Aims: Patients with severe asthma (SA) represent a group of asthmatics that is poorly responsive to standard of care treatment thus leading in some cases, in life-threatening disease exacerbations. Currently-available biologic therapies display superior efficacy mainly in patients with mild-to-moderate allergic or eosinophilic asthma. Hence, targeting factors that hold broader effects on airway inflammation than existing biologics could constitute an attractive therapeutic approach for SA patients. Thymic stromal lymphopoietin (TSLP) is an upstream initiator of the inflammatory cascade thus representing one such appealing therapeutic target. Still, the precise role of TSLP in SA pathogenesis remains elusive. Our aim was to investigate whether inhibition of TSLP in vivo can restrain excessive non-type inflammatory responses that prevail in SA and ameliorate disease phenotype.

Methods: 8-12 week-old female C57BL/6 were sensitized with HDM and c-di-GMP intranasally (i.n.) on days 1, 3, and 5. Mice were then rested for 5 days and subjected to 3 challenge sets involving 3 consecutive challenges with HDM and c-di-GMP with a rest of 4 days between challenge sets. c-di-GMP was administered i.n. along with HDM, on the first day of each challenge set, followed by HDM administration in the next 2 challenges. For the preventive protocol, anti-TSLP or the respective isotype control were given i.n. for three consecutive days prior to allergen sensitization. Mice were sacrificed 24 hours after the last challenge. BALF, lungs and serum were isolated from all experimental groups. BAL inflammatory cell counts, peribronchial and perivascular inflammation, mucus production and cytokine release were measured in serum, BALF and lung homogenates by ELISA. Mice with SA were also compared with mice with mild-to-moderate asthma that received HDM i.n. on days 1, 3, and 5, then rested for 5 days and subjected to 3 challenge sets involving 3 consecutive challenges with HDM.

Results: We observed significantly increased TSLP levels in the BALF, lung homogenates and serum of mice with SA compared to mice with MMA and to a greater extent to control mice (naïve). In vivo blockade of TSLP before allergen sensitization significantly decreased the levels of peribronchial and perivascular inflammation, mucus production by goblet cells as well as total numbers of BAL infiltrating inflammatory cells and especially neutrophils. We also detected decreased levels of IL-17, IFN-γ and IL-13 in the serum, BALF and lung homogenates of SA mice that received anti-TSLP compared to SA and to a greater extend MMA mice. Finally, in vivo ablation of TSLP also diminished the expression levels of type1, 2 and 17 cytokines in mediastinal lymph node cell culture supernatants upon ex vivo allergen stimulation.

Conclusions: Our data reveal that inhibition of TSLP before allergen sensitization in a well-established murine model of SA restrains pulmonary inflammation and attenuates key asthma features. Our studies may pave the way for delineating the molecular mechanisms through which TSPL orchestrates non type inflammatory responses that prevail in SA.

[6] Towards minimizing carbon footprint of beclometasone dipropionate fixed-dose metered-dose inhalers: two bioequivalence trials to compare formulations with a novel propellant to the currently marketed formulations used with or without spacer

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session I - Asthma & COPD

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Background: Chiesi is developing a portfolio of metered-dose inhaler (MDI) products containing a propellant (HFA-152a) with lower global warming potential and comparable pharmacokinetic (PK) properties to currently marketed MDIs containing the HFA-134a propellant, with the aim to maintain the range of treatments for patients, while reducing the carbon footprint. Methods: Two new beclometasone dipropionate (BDP) MDIs containing HFA-152a and BDP at either 200 µg (High Strength (HS)) or 100 µg (Medium Strength (MS)) per inhalation are being developed and compared to their corresponding currently marketed HS and MS formulations with the HFA-134a propellant. Following the stepwise approach recommended by the European Medicines Agency, bioequivalence was first investigated in vitro. Bioequivalence could be demonstrated only between the MS formulations when using a spacer, prompting the need for two clinical PK trials (CT1 and CT2). Both were single dose, randomised, double-blind clinical trials, each conducted in 71 healthy adults. CT1 was a 4-way cross-over trial comparing the PK properties of the new and current BDP HS and MS formulations used without spacer. CT2 was a 2-way crossover clinical trial comparing the new and the current BDP HS formulation when using the Volumatic™ spacer. Serial blood samples were collected to assess primary PK endpoints: the maximum concentration (Cmax) and area under the curve for BDP (surrogate for efficacy) and for BDP's main active metabolite, B17MP (surrogate for safety). Results were analysed using a standard linear model. Ratios of adjusted geometric means (GMR) between test and reference were calculated with their 90% two-sided confidence intervals (CIs). Results: Bioequivalence was demonstrated for BDP and B17MP between the HS formulations used without (CT1) and with (CT2) spacer. Considering the MS formulations used without spacer (CT1), bioequivalence was demonstrated for B17MP. For BDP, the lower limit of the 90% CIs of the GMRs of Cmax was marginally below the bioequivalence acceptance interval (i.e., 79.46%). This minor mismatch was considered not clinically relevant in terms of efficacy. Conclusions: These two CTs support therapeutic equivalence between the new BDP

formulations with HFA-152a and the current HFA-134a formulation and the timely introduction of treatment options enabling seamless transition for patients, while minimizing carbon emissions.

Clinical Trial	**CT1** Treatments WITHOUT Volumatic® Spacer	
Comparison	**BDP 200 µg/actuation (HS)** HFA-152a vs. HFA-134a	
Parameter	C_{max} [a)] PE (90% CI)[c)]	AUC_{0-t} [b)] PE (90% CI)[c)]
BDP	99.94 (89.99;110.98)	100.02 (90.91; 110.05)
B17MP	97.87 (92.31; 103.75)	101.31 (98.26; 104.46)
Clinical Trial	**CT1** Treatments WITHOUT Volumatic® Spacer	
Comparison	**BDP 100 µg/actuation (MS)** HFA-152a vs. HFA-134a	
Parameter	C_{max} [a)] PE (90% CI)[c)]	AUC_{0-t} [b)] PE (90% CI)[c)]
BDP	87.89 (79.46; 97.22)	90.74 (82.70; 99.56)
B17MP	94.43 (87.43; 101.99)	101.29 (97.70; 105.00)
Clinical Trial	**CT2** Treatments WITH Volumatic® Spacer	
Comparison	**BDP 200 µg/actuation (HS)** HFA-152a vs. HFA-134a	
Parameter	C_{max} [a)] PE (90% CI)[c)]	AUC_{0-t} [b)] PE (90% CI)[c)]
BDP	107.63 (98.90; 117.12)	107.13 (99.14; 115.77)
B17MP	109.47 (102.64; 116.77)	109.23 (103.40; 115.39)

a) C_{max} maximum plasma concentration
b) AUC_{0-t} area under the curve between time zero and the last quantifiable time point
c) Point estimate (PE) and 90% confidence interval (CI) of the ratios of adjusted geometric means of log-transformed parameters from the linear mode

[7] Comprehensive Diagnostic and Management Approach in a Case of Bilateral Bronchiectasis with Hemoptysis in a Heavy Smoker

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session II - Cross Tracks Topics and Late Breaking from research

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Background: Bilateral bronchiectasis presents significant diagnostic and therapeutic challenges, especially in patients with heavy smoking histories and concurrent symptoms like hemoptysis. This case report discusses the interdisciplinary approach taken for a 47-year-old male smoker, emphasizing the importance of thorough investigations and targeted management strategies.
Case Presentation: A 47-year-old male with a history of heavy smoking (2-3 packs/day) presented with bilateral bronchiectasis and episodes of hemoptysis. The patient, a professional driver, also complained of severe gastroesophageal reflux disease (GERD). Initial investigations included chest X-rays, comprehensive blood tests, sputum cultures, and immunoglobulin levels, all yielding normal or negative results, pointing to non-infectious etiologies.
Diagnostic Focus: The diagnostic strategy employed high-resolution computed tomography (HRCT), which showed ground-glass opacities (GGO), cystic changes, and multiple small nodules in the left lung, suggestive of a complex interplay of airway disease and potential remote granulomatous disease. Follow-up HRCT indicated stable disease without progression of noted abnormalities.
Management: Management included pharmacological treatment with Nexium 40 mg for GERD and Tiotropium for bronchial symptoms. Recommendations for lifestyle modifications, particularly smoking cessation, airways clearance techniques, and vaccinations, were emphasized to reduce symptom exacerbation and prevent future complications.
Outcomes: The patient's condition remained stable with the implemented treatment regimen. Follow-up plans included a repeat CT chest and echocardiogram to monitor the disease's progression and cardiac function, which remained within normal limits during the initial assessment.
Conclusion: This case underscores the necessity for a holistic approach in the management of bronchiectasis, particularly in patients with significant smoking histories. Regular monitoring, combined with comprehensive diagnostic evaluations and tailored therapeutic interventions, is crucial for managing such complex cases effectively.

[8] Safety and Quality Effects of Early Mobility Protocols for Mechanically Ventilated Patients in Intensive Care Units.

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session II - Cross Tracks Topics and Late Breaking from research

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Abstraction

In intensive care units (ICUs), early mobility protocols (EMPs) for patients on mechanical ventilation have attracted attention for their ability to speed up recovery and lower problems. This evaluation looks at how introducing EMPs in this sensitive group affects safety and quality. Research shows that early mobility can enhance functional results, reduce hospital stays, and considerably reduce the prevalence of ICU-acquired weakness (ICU-AW). But one important factor to take into account is how safe these procedures are. To guarantee patient safety, adverse occurrences including falls, tube dislodgment, and hemodynamic instability need to be continuously watched. Research indicates that although early movement may result in favorable results, the type of mobility regimen used (passive vs. active) affects the probability of unfavorable occurrences. The review emphasizes how crucial it is to create customized EMPs that weigh the possible hazards against the advantages of mobility. It emphasizes how important it is to have uniform evaluation standards in order to properly analyze safety and quality results. In order to maximize patient recovery and reduce problems, this review of recent research ultimately supports the inclusion of safe early mobility strategies in intensive care units. To improve these procedures and provide best practices for patients on mechanical ventilation, more research is necessary.

[9] A validation study examining frequently utilized mathematical models for assessing the risk of malignancy in pulmonary nodules in India.

Category: Poster

Session: 17/01/2025 (18:45-19:45) - Poster Session II - Cross Tracks Topics and Late Breaking from research

V S ASWITH CHOWDARY JONNALAGADDA[1]; THANGAKUNAM BALAMUGESH[1]; CHRISTOPHER DEVASAHAYAM JESUDASAN[1]; ISAAC T J BARNEY[1]; IRODI APARNA[2]; ROBINSON LEENA[1]

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Background/Aims:
Pulmonary nodules are frequently observed in routine clinical practice. The management of these nodules is primarily influenced by the assessed probability of malignancy. Although several models exist to estimate this probability, only a limited number have undergone external validation. The primary aim of this study was to compare and validate the Brock University model, the Veteran Affairs model, and the Mayo Clinic model in predicting lung malignancy among Indian patients with pulmonary nodules.

Methods:
We conducted a retrospective screening of 30,987 CT scan reports from the radiology information system (RIS) at our institution, specifically targeting reports that included the keyword "nodule" from 2015 to 2022. Only patients with comprehensively evaluated nodules were included in our analysis. We applied the Brock University, Veteran Affairs, and Mayo Clinic models to each patient. To assess the diagnostic accuracy of each model, we constructed a receiver operating characteristic (ROC) curve and assessed the area under the ROC curve.

Results:
Out of the 282 patients, 202 eventually had a benign etiology and 80 had a malignant etiology. The areas under the ROC curves(AUC) with sensitivity(Sn) and specificity(Sp) for each prediction model for diagnosing malignancy were as follows, Brock university model 0.762 (0.708–0.811, n = 282, Sn = 80%, Sp = 62.38%); Veteran affairs model 0.739 (0.683 – 0.789, n = 282, Sn = 83.75%, Sp = 55.94%); and Mayo clinic model 0.78 (0.727–0.827, n = 282, Sn = 77.5%, Sp = 66.34%). There was no statistically significant difference in the performance of the 3 models.

Conclusions:
The diagnostic accuracy of current prediction models was found to be lower in the Indian population compared to the Western population. Nevertheless, it is noteworthy that all prediction scores demonstrated comparable performance within the Indian population.

[10] An Unusual Cause of Orthopnea: Diagnosing Diaphragmatic Paralysis via Ultrasound

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session II - Cross Tracks Topics and Late Breaking from research

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Background/Aims: Orthopnea, commonly associated with cardiac dysfunction, can also arise from non-cardiac causes, requiring a broad diagnostic approach.
This case study examines a 65-year-old male with type 2 diabetes, obesity, hypertension, and a 20 PKY smoking history — who presented with worsening orthopnea alongside other non-cardiac symptoms.
This study aims to investigate potential non-cardiac causes of orthopnea and assess the diagnostic power of chest ultrasound in identifying alternative etiologies.

Methods: Patients' symptoms evolved from shoulder pain to marked orthopnea, leading to intolerance to recumbent position and prompting an emergency department visit in February 2021. A chest X-ray showed bibasal parenchymal opacities with a mild bilateral pleural effusion, leading to his admission. Blood tests showed mild leukocytosis and slightly elevated C-reactive protein; echocardiography was normal.
Following an unsuccessful trial of diuretics and ceftriaxone, the patient underwent bronchoscopy and bronchoalveolar lavage, with negative cultures and cytology. After discharge, he was readmitted in another hospital were he underwent the same diagnostic workup. In both occasions orthopnea prevented a CT scan.
He referred to our outpatient clinic for a second opinion. Given his inability to tolerate a supine position and hemidiaphragm elevation on X-ray, a chest ultrasound was performed, revealing bilateral diaphragmatic paralysis (right thickening fraction 0%, right excursion 8 mm on full inspiration) with bibasal lung atelectasis. The patient was referred for phrenic electromyography (EMG), that indicated phrenic denervation with an axonal and demyelinating neuropathy affecting the brachial plexus.
Treatment began with prednisone (1 mg/kg) and nocturnal non-invasive ventilation (NIV) due to hypoventilation.

Results: Following corticosteroid therapy and NIV, the patient showed a slow but gradual improvement in diaphragmatic motion and a reduction in dyspnea. Follow-up EMG testing

indicated reinnervation in the deltoid and suprascapular muscles, alongside normalized axillary and phrenic nerve conduction.
Pulmonary function tests (PFTs) gradually improved, with a recover in inspiratory capacity and vital capacity (VC) over time.
Repeat diaphragmatic ultrasounds showed restoration of diaphragm mobility in the semi-recumbent position, with a normalization of excursion and thickening fraction after 12 months of treatment.
By October 2023 the patient's pulse-oximetry showed near-normal oxygen saturation levels, and arterial blood gas analysis indicated reduced CO2 levels and maintained SaO2.
Diaphragmatic function improved to the point where NIV could be discontinued in February 2024.

Conclusions: This case highlights that orthopnea, particularly in patients with comorbitdities, may originate from neuromuscular dysfunction rather than solely from cardiac causes.
Diaphragmatic ultrasound, is a valuable, non-invasive tool that enables rapid assessment of diaphragm function and aids in differentiating between cardiac and non-cardiac origins of orthopnea.
For this patient, the combination of diaphragm ultrasound and EMG was crucial in diagnosing an inflammatory neuropathy affecting the phrenic nerve and brachial plexus.
The findings suggest that diaphragmatic dysfunction assessment should become an integral component of the clinical evaluation of dyspnea.
This case supports the utility of bedside chest ultrasonography as a first-line diagnostic approach in acute and chronic respiratory conditions, promoting its inclusion in routine respiratory assessments along traditional physical examination to guide appropriate therapeutic interventions and optimize patient outcomes.

[11] A high-risk genetic finding in interstitial lung disease: the lethal impact of SFTPA2 gene variant

Category: Poster

Session: 17/01/2025 (18:45-19:45) - Poster Session II - Cross Tracks Topics and Late Breaking from research

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Background/Aims: Individuals with some forms of fibrotic interstitial lung disease (ILD) have an increased risk of carcinogenesis. Development of lung cancer leads to poorer survival than having either condition alone.

Case presentation: A 44-year-old-woman presented to the Chest clinic with exertional breathlessness and persistent dry cough worsening over several months. She also reported diffuse joint pain.
She had been successfully treated for pulmonary and right ankle tuberculosis ten years earlier, was a non-smoker and had no occupational exposures. Her two siblings had died from lung cancer aged 46 and 35.
Thoracic computed tomography (CT) scan revealed peripheral consolidative abnormalities with ground-glass opacities (GGO) bilaterally along with calcific mediastinal lymph nodes. Blood tests, including autoimmune screen, were negative. Lung function testing revealed a restrictive ventilatory pattern and moderately reduced transfer capacity of the lung for carbon monoxide (TLco).
After 6 months, due to persisting GGO and consolidation, she underwent a percutaneous CT-guided lung biopsy that revealed fibro-inflammatory abnormalities but did not yield a definitive diagnosis. Consequently, biopsy by video-assisted thoracic surgery (VATS) was performed, revealing a usual interstitial pneumonia (UIP) pattern with co-existent invasive mucinous adenocarcinoma.
The patient was promptly referred to an oncologist for appropriate lung cancer management and to the Royal Brompton Hospital for advice on initiating antifibrotic therapy for her progressive ILD. By then, she had become dependent on 24-hour oxygen after experiencing a significant radiological, symptomatic and functional decline.
Due to the young age and family history, the patient underwent molecular genetic testing which identified a heterozygous likely pathogenic missense variant in the *SFTPA2* gene (c.557A>G). Despite antifibrotic treatment and chemotherapy, she died 1 year later due to a combination of metastatic cancer and advanced pulmonary fibrosis.

Discussion: Germline variants in surfactant-related genes (SRGs) account for 1–5% of cases of familial pulmonary fibrosis. Six SRGs, specifically *SFTPA1*, *SFTPA2*, *SFTPB*, *SFTPC*, *NKX2-1*, and *ABCA3*, have been implicated in the development of fibrotic ILD. *SFTPA2* encodes a surfactant-associated protein essential for normal lung function, stabilizing the alveolar gas-exchange surface and contributing to host defence. The particular variant identified in this patient occurs in the carbohydrate-recognition domain where pathogenic variants are known to cluster. It has previously been described in two ILD cases. Notably, *SFTPA2* variants, compared to other SRG variants, are associated with a higher risk of developing lung cancer.

Conclusions: This case highlights the complex interplay between genetic predisposition and disease pathogenesis as well as progression in patients with ILD and lung cancer. The identification of a pathogenic *SFTPA2* variant emphasizes the importance of genetic screening in young patients with a familial history of pulmonary fibrosis and lung cancer, as such variants may inform both prognosis and treatment strategies.
Notably, SRG variants, particularly *SFTPA1* and *SFTPA2*, have been associated with an elevated risk of lung cancer, underscoring the need for careful interpretation of chest CT scans in these patients and the potential benefit of a targeted screening program for both fILD and lung cancer in this young adult population. However, the prognosis for patients with concurrent ILD and lung cancer remains poor, highlighting the need for advances in more effective therapeutic approaches.

[12] Case Report: Management of Bronchiectasis with Underlying Common Variable Immunodeficiency (CVID) on 28 years old woman

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session III - Respiratory Tract Infections

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Background: A 28-year-old female, known to have bronchiectasis since childhood, presented for assessment and optimization of therapy. The patient had a history of recurrent parotitis and frequent exacerbations every 1-2 months. She was previously followed regularly at Jeddah Military Hospital but lost follow-up five years ago. A lobectomy was advised 14 years prior but was refused by her father.
Clinical Presentation: The patient, a mother of three, was vitally stable with an ECOG score of 0 during examination. Diminished air entry was noted in the left lower zone. A CT chest revealed left lower lobe and right middle lobe bronchiectasis.

Diagnostic Assessment:

- **Physical Examination:** Coarse diffuse crepitations over the chest, clubbing noted.
- **Laboratory Tests:** Normal CBC, markedly low immunoglobulin levels (IgG, IgA, IgM), normal renal and hepatic functions.
- **Radiology:** CT chest showed bilateral lower lobe predominant varicose bronchiectasis with multiple supra-diaphragmatic lymphadenopathy and splenomegaly.
- **Pulmonary Function Tests (PFTs):** FVC 1.66 L (55%), FEV1 1.09 L (42%), DLCO 63%.
-

Clinical Course: The patient was referred from thoracic surgery to pulmonology for pre-operative evaluation. She was also seen in a virtual immunology & allergy clinic due to her history of hypogammaglobulinemia and recurrent respiratory infections, suggesting common variable immunodeficiency. The patient was started on subcutaneous immunoglobulin therapy and had a significant reduction in breakthrough infections.

Management:

- **Thoracic Surgery & Pulmonology:** Continuation of azithromycin for chronic suppression, referral for pulmonary rehabilitation, and consideration of surgical intervention after optimization.
- **Immunology:** Initiation of subcutaneous immunoglobulin therapy, ongoing assessment for potential genetic underpinnings via whole exome sequencing.
- **Neurology:** Evaluation for facial palsy and coordination with immunology to assess potential immunotherapy-related adverse effects.

Discussion: This case illustrates the complexity of managing bronchiectasis compounded by CVID. The patient's recurrent infections and immunodeficiency required a multidisciplinary approach involving pulmonology, thoracic surgery, and immunology.

Regular monitoring and adaptation of therapy were key in managing her condition, particularly with the challenges posed by her underlying immunodeficiency.

Conclusion: Optimal management of bronchiectasis in the context of CVID requires a coordinated approach to address both the pulmonary and immunological aspects of the disease. Continuous evaluation and adjustment of immunoglobulin therapy, along with vigilant monitoring of pulmonary function and infection control, are crucial for improving patient outcomes.

[13] Comprehensive Management of Acute on Chronic Respiratory Symptoms in an Elderly Patient with Comorbidities: A Case Report"

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session III - Respiratory Tract Infections

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Background: Complex pulmonary conditions in elderly patients with comorbidities like diabetes mellitus, hypertension, and dyslipidemia require meticulous evaluation and management. This case report details the diagnostic and therapeutic approach for a 68-year-old female presenting with chronic respiratory symptoms exacerbated by an acute infectious process.
Case Presentation: The patient, with a medical history of diabetes, hypertension, and dyslipidemia, reported chronic exertional dyspnea without other respiratory symptoms. Following exposure to a sick individual, she developed flu-like symptoms, high-grade fever, and a productive cough with greenish sputum. Her condition worsened with the onset of mild hemoptysis and desaturation, leading to her presentation at the clinic where she was found to be hypoxic.
Investigations: Initial management in a polyclinic included cefixime and symptomatic treatment. Upon deterioration, further investigations at the pulmonary clinic included a CT chest, which revealed a mixed picture of segmental consolidations, tree-in-bud nodules, signs suggestive of past tuberculosis (TB), pleural effusions, and indications of pulmonary hypertension.
Diagnosis: The differential diagnosis considered community-acquired pneumonia (CAP), potential active TB, and cardiogenic pulmonary edema.
Management: The patient was urgently admitted for isolation and management under pulmonary care, despite a lack of available beds initially. Treatment included intravenous antibiotics, oxygen therapy, and comprehensive screening for TB, including sputum and blood cultures, PCR, and a respiratory panel. Cardiac workup and echocardiogram were recommended due to signs of potential pulmonary hypertension.
Conclusion: This case underscores the importance of a thorough diagnostic assessment in elderly patients presenting with acute on chronic respiratory symptoms. It highlights the challenges of managing complex cases with overlapping infectious and cardiopulmonary processes in a setting of limited resources.

[14] Effectiveness of Airway Clearance Techniques in Bronchiectasis Management, scoping review

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session III - Respiratory Tract Infections

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Background: Bronchiectasis is a chronic pulmonary condition characterized by irreversible airway dilation, which has seen a rising prevalence and significant societal burden. This study aims to evaluate the efficacy of various airway clearance techniques (ACTs) in managing bronchiectasis and its exacerbations, including non-cystic fibrosis bronchiectasis.

Methods: A systematic review was conducted by searching online databases such as Google Scholar and PubMed for articles published in English within the last five years. The search focused on studies that reported the effectiveness of different ACTs in bronchiectasis management.

Results: Five articles were included in the final analysis. The studies examined various ACTs, including huffing, exercise, the active cycle of breathing technique, instrumental strategies, chest physiotherapy with or without saline nebulization, positive expiratory pressure, and the ELTGOL technique. The findings suggest that these techniques significantly improve the management of both acute exacerbations and chronic aspects of bronchiectasis. Among these, the bubble-positive expiratory pressure technique was highlighted as particularly effective.

Conclusion: ACTs are a crucial component of the therapeutic regimen for bronchiectasis, offering significant benefits in reducing the impact of both acute and chronic symptoms. Further research is recommended to optimize these techniques and explore their long-term benefits in larger cohorts.

[15] The impact of calculating ROX index in delaying intubation with COVID-19 patients at King Abdullah medical city

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session III - Respiratory Tract Infections

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Background: High-Flow Nasal Cannula (HFNC) is a respiratory support device that not only covers the nose akin to an oxygen mask but also includes nasal prongs for enhanced oxygen delivery. A ROX score of ≥4.88 at 12 hours is indicative of a reduced likelihood of progression to mechanical ventilation.

Objective: The study aimed to assess the efficacy of HFNC as a potential predictor for delaying intubation and to determine the accuracy of the ROX index in predicting HFNC failure among COVID-19 patients in Intensive Care Units (ICUs).

Methods: This retrospective observational analysis utilized prospectively collected data from ICU patients at King Abdulaziz Medical City (KAMC). The data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS).

Results: Statistically significant mean differences ($p < 0.05$) were observed on days 1-1, 1-2, 2-1, 2-2, 3-1, 3-2, 4-2, 10-1, and 10-2. These findings support the use of the ROX index for predicting the need for intubation in COVID-19 patients with Type I respiratory failure who are receiving HFNC therapy.

Conclusion: The ROX index proves to be a reliable parameter for intubation prediction in COVID-19 patients treated with HFNC. A ROX index value above the cut-off point of 5.35 at day 10-2 is associated with successful HFNC therapy outcomes, suggesting a lower mortality risk.

[16] Improvement in the Quality of life (QoL) with the Utilization of Mechanical Ventilation for COVID-19 Patients: A Systematic Review
Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session III - Respiratory Tract Infections

Ahmad Mohammad Alessa[1]

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Introduction: This paper examines the profound impact of the COVID-19 pandemic, which has led to millions of deaths worldwide. It begins with an extensive overview of the pandemic's ramifications and the critical role that medical professionals played in saving lives using mechanical ventilation for COVID-19 patients.

Methods: The discussion is structured into several sections, beginning with a detailed description of the types of mechanical ventilation used. The effectiveness of these ventilation methods in treating COVID-19 and its complications is comprehensively analyzed.

Results: The paper then transitions to an examination of the measures implemented to enhance the Quality of Life (QoL) for patients undergoing mechanical ventilation due to COVID-19. It details the observed improvements in QoL and explores the characteristics of QoL among these patients.

Conclusion: Finally, the paper proposes to further investigate QoL-related outcomes in hospitalized COVID-19 patients and evaluates the long-term effects of mechanical ventilation. It underscores the significant improvements in patient conditions resulting from modern treatment modalities and sets the stage for future research in this area.

[17] Beyond the diagnosis; exploring the determinants of quality-of-life in bronchiectasis patients

Category: Poster

Session: 17/01/2025 (18:45-19:45) - Poster Session III - Respiratory Tract Infections

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Background/Aims: Bronchiectasis is a long-term, non-fatal respiratory disease that significantly affects quality of life (QoL). The core clinical determinants influencing the QoL include persistent sputum production, breathlessness, exacerbations and chronic infection with pseudomonas. Furthermore, frequent hospitalisation and the absence of a direct treatment and permanent cure amplifies the poor QoL. Thus, these patients are inevitably vulnerable to experiencing diminished QoL. Therefore, in this context uncovering the determinant of QoL is crucial for optimizing management strategies and improving their overall well-being. This study was conducted to identify the factors associated with QoL among bronchiectasis patients attending respiratory clinics in government healthcare institutions in the Colombo District, Sri Lanka.

Methods: A cross-sectional study was conducted to assess the factors associated with QoL among 427 bronchiectasis patients attending respiratory clinics in government healthcare institutions in the Colombo District. The first bronchiectasis patients who came to each clinic were selected. From each clinic, patients were assigned according to the probability proportionate size. The QoL was evaluated using the Sinhala version of the Bronchiectasis Health Questionnaire (BHQ). The factors were assessed with an interviewer-administered bronchiectasis QoL questionnaire pretested and piloted. It included the following factors; socio-economic, disease-related, patients' practices related to disease, comorbidities, Body Mass Index, mMRC score, investigation reports, perception of family and social support and receiving incentives. The data was collected by the principal investigator and well-trained pre-intern doctors. Administrative and ethical approval was obtained before data collection. Informed written consent was obtained from each participant before administering the tool. The normality of BHQ scores was assessed by Q-Q plots and histograms and by the Shapiro-Wilk test. Associations between QoL and the categorical variables with two categories were analysed using an independent t-test and categorical variables with more than two categories were analysed using Analysis of variance. The p-value < 0.05 was considered statistically significant. The post-hoc analysis was done for all the variables that were significant and had three or more categories.

Results: The response rate was 99.5%, with 425 participants. The mean age of the study population was 64.3 years (SD=10.7), with a median of 66 years (IQR=16 years). The study population 44.9% (n=191) was males. The BHQ score was normally distributed. Following analysis, higher income category, lesser duration of the disease, lesser number of

exacerbations, lesser number of hospital admissions, using inhalers, doing chest physiotherapy, lower mMRC score, not having CVD and other CRD were found to have a significant association with better QoL among bronchiectasis patients.

Conclusions: The QoL among bronchiectasis patients were also found to be significantly higher with certain social and clinical factors such as higher income category, lesser duration of the disease, lesser number of exacerbations, lesser number of hospital admissions, using inhalers, doing chest physiotherapy, lower mMRC score, not having CVD and other CRD. Hence, it is recommended to have a multidisciplinary approach to address these aspects and to incorporate strategies to provide social support for these patients when managing bronchiectasis patients.

[18] Mapping the dimensions of well-being among bronchiectasis patients: Factorial validity of the Bronchiectasis Health Questionnaire

Category: Poster

Session: 17/01/2025 (18:45-19:45) - Poster Session III - Respiratory Tract Infections

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Background/Aims: Bronchiectasis is a respiratory disease which majorly affects the quality of life (QoL) of the patients. Bronchiectasis Health Questionnaire (BHQ) is a concise tool that can be efficiently used in busy clinic steps. However, there is limited evidence of its factorial validity assessment. Therefore this study was conducted to assess the factorial validity of the BHQ among bronchiectasis patients in the National Hospital for Respiratory Disease (NHRD), Sri Lanka.

Methods: Two descriptive cross-sectional studies were conducted for the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) of BHQ. The setting was the NHRD clinics and was conducted from December 2022 to March 2023. Bronchiectasis patients attending clinics were the study population with the exclusion of those who were mentally impaired, aged < 18 years, had exacerbations during last two weeks and were unable to respond to questionnaire in Sinhala. The sample size was 112 each for EFA and CFA. The first five patients were recruited on each clinic day until the desired number was achieved. The standard card number was used to distinguish individual patients and to exclude them from the CFA sample if they had been already selected for the EFA sample. The study instrument comprised socio-demographic information and the BHQ- Sinhala. BHQ was translated into Sinhala language using forward and back translation methods. Data was collected by the principal investigator (PI) and data collectors and was entered by the PI. The EFA was performed using SPSS software and the CFA was performed using the LISREL software. The normality was assessed using the Shapiro-Wilk test and graphical methods. Assumptions for PCA were performed during EFA. Initial factor analysis was done based on Eigenvalues and the scree plot. Compatibility of data and statistical assumptions were assessed before performing the CFA. The reliability was assessed using internal consistency and test-retest methods. Administrative clearance and ethical clearance were obtained. Informed written consent was obtained from all the participants. Permission of the original developer of BHQ was granted.

Results: The EFA sample response rate was 100%, and 53.6% (n=60) were females, with 70%(n=78) of were being married. The mean age of the study group was 56.1 years, (SD =15.5). The BHQ scores were the normally distributed. EFA revealed two factors.

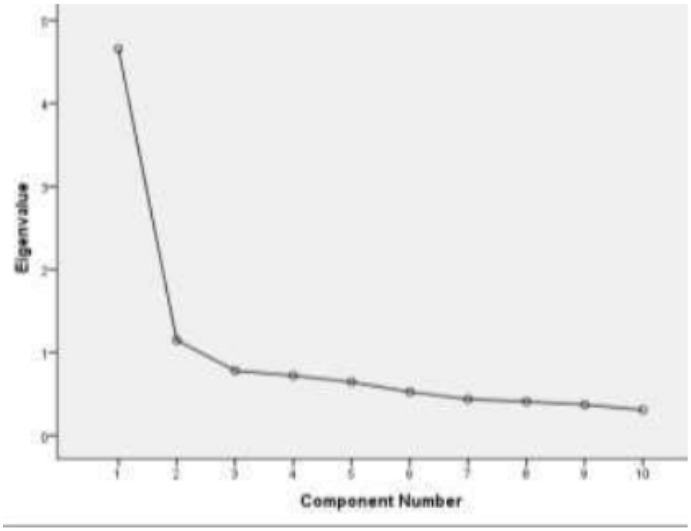

Figure 1: The Scree Plot of EFA

The response rate was 100% for the CFA study sample, where 61.6% (n=69) were females and 65% (n=73) of were married. The mean age was 54.2 years (SD=16.5). CFA confirmed the two-factor model. Factor-1 was named as “Feelings and physical symptoms of bronchiectasis” and factor-2 was named “Impact of bronchiectasis on normal life”. The internal consistency measured using Cronbach’s α was 0.866 and the test-retest reliability was 0.877.

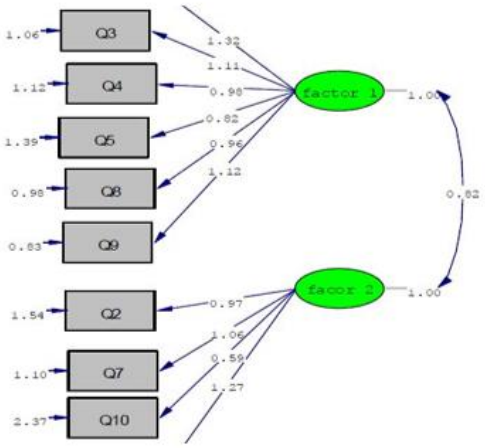

Figure 2: Illustration of the Two Factor Model of BHQ

Conclusions: The BHQ has shown good factorial validity and therefore it’s a valid and reliable tool to assess the QoL among bronchiectasis patients.

[19] Nontuberculous mycobacterial lung disease (Mycobacterium xenopi) in a patient with eating disorder without other risk factors

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session IV - Respiratory Tract Infections

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Background/Aims: Nontuberculous mycobacteria (NTM) are a wide group of environmental bacteria that generally cause diseases in immunocompromised hosts or patients with chest or lung abnormalities; however, NTM are increasingly recognized as causes of lung diseases in immunocompetent hosts in which risk factors are not completely known. Some authors hypothesized that malnutrition and eating disorders like anorexia nervosa could be risk factors that may promoting NTM lung diseases. Abnormal immune response due to severe malnutrition and purging behaviours/aspiration may play a role in the development of NTM lung infections in these patients.

Methods: We described the case of a 29-year-old woman with a history of anorexia nervosa (AN) who accessed our Unit for the detection of bilateral lung cavities and nodules mainly in the upper lobes on chest X-ray and afterwards on chest CT during the application process for haematopoietic stem cell donation.

Results: The patient had no previous respiratory diseases. At presentation she had a BMI of 17.7 and did not exhibit any respiratory or systemic symptoms. It was unclear whether she engaged in purging behaviours; however, in the psychiatric evaluation the eating disorder was found to be under control. Extrapulmonary involvement was ruled out through PET-CT, and systemic diseases such as ANCA-associated vasculitis or other autoimmune disorders were excluded through biochemical analyses. The interferon gamma release assay was negative. The patient underwent bronchoalveolar lavage which tested negative for mycobacteria (both molecular test and culture); the procedure was complicated by the development of pneumonia that needed broad-spectrum empirical antibiotic therapy. Given the progression of cavitary lesions on the follow-up CT scan at three weeks, a multidisciplinary discussion led to the decision to perform a surgical lung biopsy. Histological examination revealed necrotizing granulomas. The surgical sample was subjected to molecular testing for atypical mycobacteria (Genotype CM-direct Test) which was positive for *Mycobacterium xenopi,* a finding further confirmed by culture examination of the surgical sample.

Conclusions: The peculiarity of our case describing a young woman with AN and *Mycobacterium xenopi* infection is paucisymptomaticity in terms of infection. Further prospective investigations are needed to determine whether eating disorders with purging behaviours and NTM lung infections may be related and whether reversal of the eating disorder improves or prevents NTM lung infections

[20] Coinfections of Mycobacterium tuberculosis and Non-Tuberculous ycobacteria species in a cohort of 21 patients: perspective from a Reference Centre case series

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Introduction: In previous publications there are only a few case reports that address the topic of co-infections between Non tubercular mycobacteria (NTM) and/or tuberculosis (TB). However, these articles do not outline key points on the treatment of these cases which remain managed independently by the single centres. This case series investigates the clinical presentation, treatment process and outcome in patients with confirmed NTM and/or *Mycobacterium tuberculosis* (MT) coinfections.

Methods: In this monocentric retrospective observational study we collected data on 21 patients coinfected with two different mycobacteria, also including MT, diagnosed and managed in our centre. Diagnosis was based on a combination of clinical suspicion, imaging (Chest X-Ray or CT scan) and microbiological tests. Patients were divided in two different cohorts: 8 patients with a coinfection of TB and NTM (TB cohort) and the remaining 13 coinfected with two different species of NTM (NTM cohort). Therapy was established according to international guidelines.

Results and Conclusions: In the TB cohort, 2 patients (25%) were coinfected with *M. abscessus*, 2 (25%) with *M. chelonae*, the remaining with other single NTM species. After the end of TB therapy none of them showed further signs of NTM related disease. Follow up CT scans showed 4 (50%) patients with fibrotic outcomes, 2 (25%) with nodules and 2 (25%) with restitutio ad integrum. In the NTM cohort the most frequent pathogen involved was *M. avium* with 11 patients (84.6%) followed by *M. intracellulare* with 7 cases (53.84%), 2 coinfection of *M. kansasi* (15.8%) and single cases of other NTM species (7% each one). As for the therapy of coinfection, our experience suggests treating the more pathogenic mycobacteria that is probably responsible for the disease. 7 patients ended up with microbiological clearance while 4 patients experienced the recurrent isolation of 2 or more samples positive for previously treated NTM after the end of therapy. Among them only 1 patient underwent a new treatment cycle with an effective eradication of *M. intracellulare*. Radiological follow up showed 9 (69.2%) patients with nodules, 5 (38%) with consolidations, 2 (15.3%) with cavitation and 2 patients (15.3%) with restitutio ad integrum. The two different cohorts differ in terms of compliance of therapy (100% completed the therapy for TB vs

53.8% for NTM), clinical status (50% without symptoms after therapy in TB group vs 23% in NTM group) and radiological outcome (15.3% with normal imaging in the NTM cohort vs 25% in the TB one). Overall, patients in the TB cohort are younger, mostly males and with a lower risk of disease recurrence and greater compliance to therapy. The NTM cohort conversely, is mostly represented by elderly women with predisposing comorbidities such as bronchiectasis. This group is also burdened by lower compliance given the long treatment and a worse clinical outcome with persistence of symptoms (77%), radiological sequelae (84.7%) and NTM isolates recurrence (30.7%). Our study underlines that an expert consultation with a clinical, microbiological, and radiological evidence should be sought in formulating the treatment plan and the follow up. Strong efforts are needed to discover new therapies and strategies to face these polymicrobial illnesses that will increase as the population gets older. This study, at last, outline the need of consensus guidelines.

[21] Masquerading Malignancy: From Cavitating MSSA Pneumonia to Squamous Cell Carcinoma Diagnosis

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session IV - Respiratory Tract Infections

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Background

A cavity is defined by the Fleischner Society as a gas-filled space within a pulmonary mass, nodule, or consolidation. The cavity wall varies in thickness depending on the underlying pathology but typically measures at least 2 mm. Cavitary lung lesions carry a broad differential diagnosis that includes a wide range of pathological conditions. Common causes includes reactivation of tuberculosis, *Mycobacterium Avium Complex*, bacterial causes; *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, septic emboli, Aspergilloma, histoplasmosis, coccidiodomycosis, primary lung carcinoma and granulomatous polyangiitis. Squamous lung carcinoma is the most common histologic subtype of primary lung cancer to cavitate. Here we present a case of squamous cell carcinoma initially treated as MSSA pneumonia emphasizing on the broad differential diagnosis.

Case Presentation

A 62 years old man with past medical history of hypertension, dyslipidemia and a ex smoker presented to our clinic for 1 month duration of chronic cough associated with hemoptysis, exertional dyspnea and significant loss of weight. Initial chest imaging revealed a large cavitating right upper lobe lesion with homogenous enhancement of right main bronchus. A bronchoscopy was done showing broad oedematous carina with diffuse whitish plug and erythematous mass obscuring right main bronchus which was complicated with bleeding mucosa upon biopsy attempt. HPE biopsy of tissue demonstrated inflammatory changes. Other diagnostic assessments, including TB workup were negative except bronchoalveolar lavage cultures grew methicillin sensitive Staphylococcus aureus and Pseudomonas aeruginosa. Although our initial concern was malignancy however as cultures grew MSSA and Pseudomonas aeruginosa, he was started on targeted antibiotics for 4 weeks duration. Repeated CT imaging revealed progression of right upper lobe collapse and residual right upper lobe cavitating lesion. We repeated a bronchoscopy which revealed a fungating mass obscuring the right main bronchus hence decided for tumor debulking and diagnostic biopsy in conjuction with interventional pulmonologist. However patient was not keen for the procedure and subsequently proceeded with right cervical lymph node biopsy that revealed a metastatic squamous cell carcinoma. He is currently undergoing palliative chemotherapy (ECOG 0) for his stage IV squamous cell carcinoma under our setting.

Conclusion

In conclusion, this case highlights on the importance of considering squamous cell carcinoma as the differential diagnosis in a cavitating pneumonia particularly an ex smoker who have risk factors for lung carcinoma.

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3. Radiological approach to cavitary lung lesions Arzu Canan , Kiran Batra,1 Sachin S Saboo,2 Michael Landay,1 Asha Kandathil1

[22] End-of-life care for lung transplant recipients: a new role for palliative medicine

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session IV - Respiratory Tract Infections

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Background: Little is known about the palliative care needs of lung transplant recipients (LTR), especially in their end-of-life phase. We reviewed the characteristics of LTR referred for co-management by palliative care (PC) at our center.

Methods: This was a monocentric retrospective study including all adult LTR who were referred to our PC consultation service between 2018 and 2022 for end-of-life care. We collected data on demographics, post-transplant PC encounters (including timing, location, and referral reason), signs and symptoms at referral and drugs being prescribed. Population was divided into groups based on reason of referral (neoplasm vs. allograft dysfunction of any kind) and on setting (outpatient vs. hospitalized).

Results: 33 patients were considered, 21 males, median age at PC referral 48 (27; 60) years old. 26 LTR were referred for terminal allograft dysfunction of any kind, whilst the rest (7) for neoplasm. The most frequently reported symptoms at referral were: dyspnea (median mMRC3 (3;4)) with oxygen desaturation on effort (29, 88%) and difficulty with everyday tasks (32,97%); fatigue (33, 100%) and hyporexia (22, 71%) with weight loss (19, 61%); anxiety and depression (26, 81%). The vast majority of patients were prescribed specific PC medication since the first evaluation: in particular, opioids (30, 94%), pain relievers (18, 69%) and anxiolytics (17, 71%). Based on indication, PC referral for graft dysfunction tended to be earlier than for neoplasm (time from PC referral to death: respectively 17 (5; 81) vs. 4 (1; 27) days, p=0.143), even if this difference was not statistically significant. At time of first PC referral, 17 LTR were seen in the outpatient clinic; their referral proved to be significantly earlier than that of hospitalized patients (respectively, 70 (12; 141) days vs. 6 (2; 20), p=0.007). As expected, when compared to outpatient referrals, hospitalized patients were

generally in more severe conditions [worse PaO2/FiO2 (231 (192; 288) vs. 281 (244; 360), p=0.036), respiratory rate (26 (23; 28) vs. 22 (19; 23), p=0.04) and Karnofsky score (40 (30;40) vs. 50 (40; 60), p=0.02)].

Conclusion: While limited, our evidence suggests that palliative care can be successfully integrated into LTR management, especially in end-of-life care. Further research is needed to understand transplant recipients' needs, in order to improve the provision of PC in this particular setting.

[23] Community Acquired Pneumonia by Legionella pneumophila unmasking Brugada Syndrome: a case report and review of the literature.

Category: Posters

Session: 17/01/2025 (18:45-19:45) - Poster Session IV - Respiratory Tract Infections

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Introduction: *Legionella pneumophila* is a major cause of community-acquired pneumonia (CAP). Brugada syndrome (BS) is a rare channelopathy usually secondary to genetic mutations in the *SCN5a* gene, which encodes the α-subunit of the cardiac sodium channel SCN5a. BS can manifest harmfully as sudden cardiac death. The specific electrocardiographic pattern of Brugada could be unmasked by fever. This is the first described case of BS unmasked by fever secondary to *Legionella pneumophila* CAP.

Case report: A 67-year-old never-smoker patient presented at the Emergency Department (ED) with a high fever (40°C) and acute hypoxemic and hypocapnic respiratory failure (Blood Gas Analysis while breathing room air: pH 7.52; PaO2 53.4 mmHg; PaCO2 23.5 mmHg). No comorbidities were reported in the past medical history. A Chest High-Resolution Computed Tomography (HRCT) revealed severe pneumonia in the left lower lobe. The urinary antigen test was positive for *Legionella pneumophila*. A diagnosis of CAP was made, and antibiotic therapy was initiated (levofloxacin 750 mg/day), while respiratory failure was initially treated with Continuous Positive Airway Pressure (CPAP) helmet and later required Non-Invasive Mask Ventilation (NIMV). Interestingly, the electrocardiogram (ECG) performed in the ED and in the Pneumology Unit during pyrexia showed a type 1 Brugada pattern (coved ST-segment elevation of more than 2 mm (0.2 mV) in V1–V3 followed by T wave inversion, elevated J point). This result was confirmed with the more specific high precordial leads ECG. Curiously, the Brugada pattern was not detectable when the ECG was repeated in apyrexia and was not present in the previous ECGs the patient had for routine controls. A diagnosis of BS was posed. Since fever can induce the potentially harmful Brugada pattern on ECG, high doses of antipyretic drugs were administered. After discharge, the patient was referred for genetic evaluation with molecular detection of a known pathogenetic mutation in the *SCN5a* gene.

Conclusions: We reported the first case of BS unmasked by fever secondary to *Legionella pneumophila* CAP. In the literature it has been reported that fever can reveal the Brugada pattern on ECG. A recent literature review highlighted that up to 30% of patients with BS unmasked by fever had pneumonia as the underlying cause. However, a detailed analysis of the pneumonia etiology is lacking. Some reported cases specified the causes as aspiration pneumonia, *Chlamydophila pneumoniae* CAP, or COVID-19 pneumonia. In cases of pneumonia and fever, healthcare providers should be vigilant in recognizing ECG signs of Brugada Syndrome to prevent the adverse outcomes associated with the disease.

Figure 1

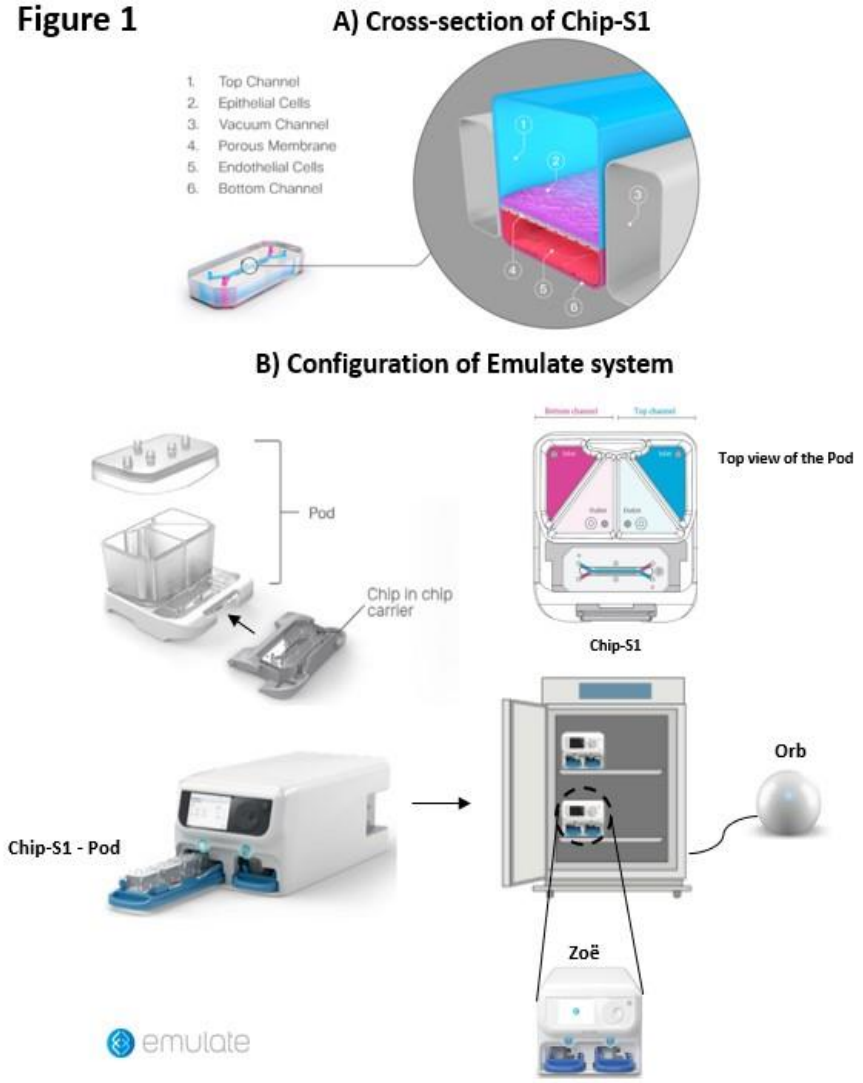


Figure 2

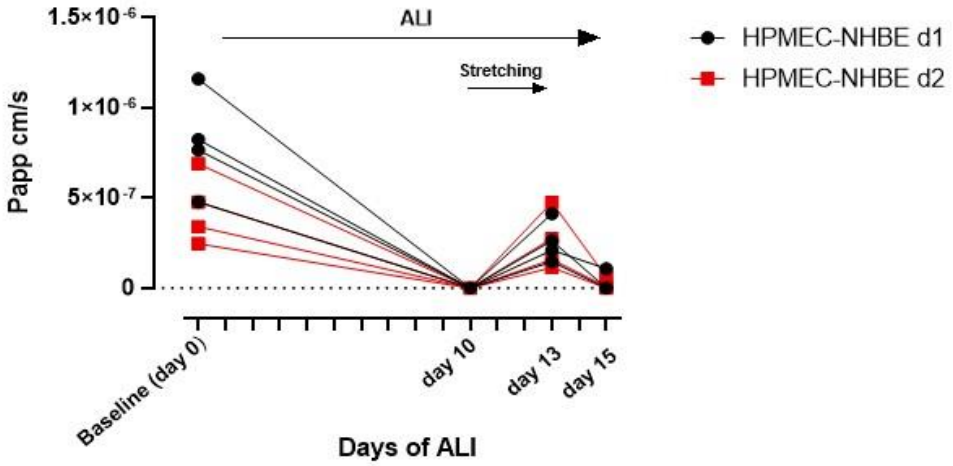
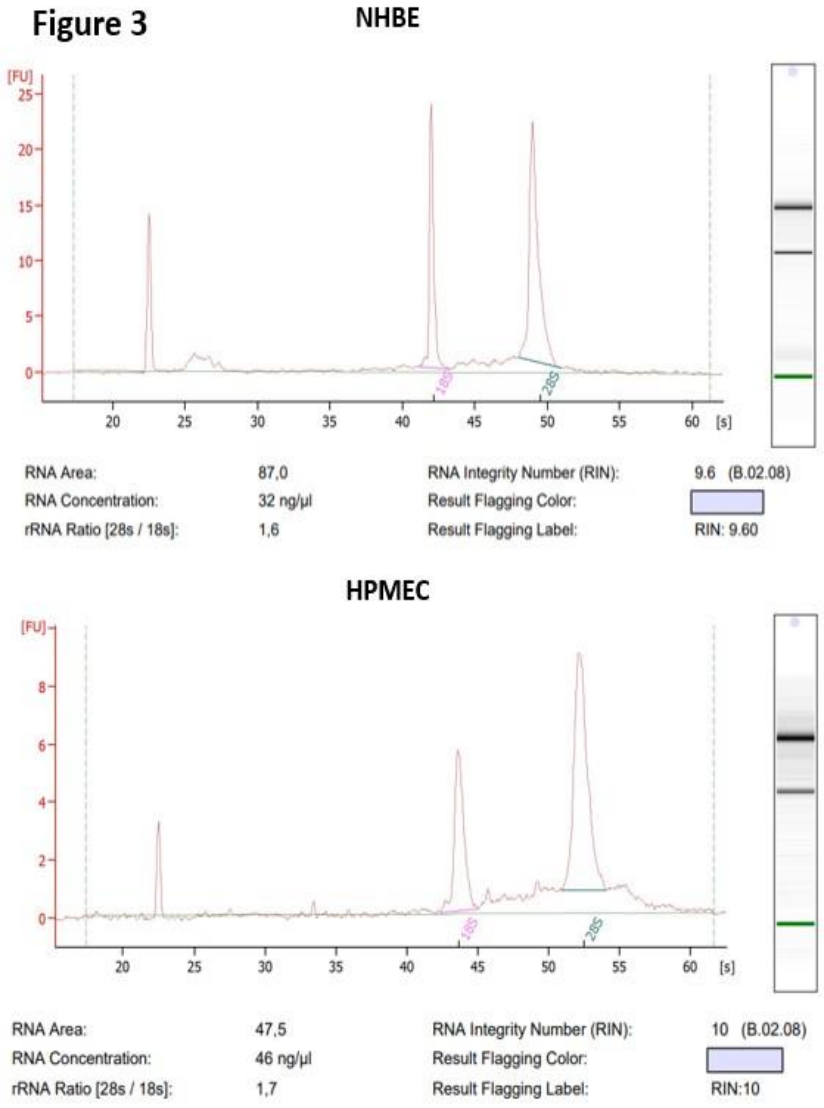

ALI
Stretching
HPMEC-NHBE d1
HPMEC-NHBE d2
Papp cm/s
1.5×10-6
1×10-6
5×10-7
0
Baseline (day 0)
day 10
day 13
day 15
Days of ALI

Figure 3



[24] Non-tuberculous Mycobacteria Epidemiology and Distribution in a North Italian Region: First Results of a Georeferencing-based Approach Study

Category: Poster

Session: 17/01/2025 (18:45-19:45) - Poster Session IV - Respiratory Tract Infections

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Background/Aims: NTM identification is increasing in industrialized countries due to a progressive implementation of diagnostic techniques. A role of the environmental risk factors both in contamination and active disease has been proposed, but the real impact is still not fully understood. However, some data suggest an association with disease occurrence in specific populations. We performed an analysis of environmental risk factors among patients affected by NTM diseases associated with the geographical characteristics of our region.
Methods: Cases were identified from NTM reports to public health authorities in Piemonte Region, Italy, from 2017 to 2021 and then clustered according to local territorial divisions. Spatial statistics were applied in order to avoid case excess in urban agglomerations. Analysis was performed by SAS 9.4 and R (SATSCAN package) software.
Results: Among a general population of 4.252.279, we identified 361 cases in five years, with a cumulated incidence rate of 0.0743cases/population. As expected, major clusters are reported in bigger cities, in particular Torino, the main city (n: 132 cases), Novara (n:12), Asti (n: 8) and Alessandria (n: 5). No significative differences are found considering incidence rates. On the other hand, a raw georeferencing-based data analysis shows six cluster with a major risk of infection, where one among them (Torino-Grugliasco) has a statistical significance (n: 136).
Conclusions: Those preliminary results show that a territorial-based approach could identify significative NTM clusters. We aim to proceed with analysis of environmental risk factors, in order to relate NTM cases to specific contaminants. Clinical data will also be considered to stratify NTM isolation and NTM diseases in our analysis.

AUTHOR INDEX


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