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(copd OR "Pulmonary Disease, Chronic Obstructive"[Mesh])

1
PLoS One

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. 2024 Feb 23;19(2):e0294120.

doi: 10.1371/journal.pone.0294120. eCollection 2024.

Combination treatment to improve mucociliary transport of Pseudomonas aeruginosa biofilms

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Affiliations expand

- PMID: 38394229

- DOI: 10.1371/journal.pone.0294120

Abstract

People with muco-obstructive pulmonary diseases such as cystic fibrosis (CF) and chronic obstructive pulmonary disease (COPD) often have acute or chronic respiratory infections that are difficult to treat due in part to the accumulation of hyperconcentrated mucus within the airway. Mucus accumulation and obstruction promote chronic inflammation and infection and reduce therapeutic efficacy. Bacterial aggregates in the form of biofilms exhibit increased resistance to mechanical stressors from the immune response (e.g., phagocytosis) and chemical treatments including antibiotics. Herein, combination treatments designed to disrupt the mechanical properties of biofilms and potentiate antibiotic efficacy are investigated against mucus-grown Pseudomonas aeruginosa biofilms and optimized to 1) alter biofilm viscoelastic properties, 2) increase mucociliary transport rates, and 3) reduce bacterial viability. A disulfide bond reducing agent (tris(2-carboxyethyl)phosphine, TCEP), a surfactant (NP40), a biopolymer (hyaluronic acid, HA), a DNA degradation enzyme (DNase), and an antibiotic (tobramycin) are tested in various combinations to maximize biofilm disruption. The viscoelastic properties of biofilms are quantified with particle tracking microrheology and transport rates are quantified in a mucociliary transport device comprised of fully differentiated primary human bronchial epithelial cells. The combination of the NP40 with hyaluronic acid and tobramycin was the most effective at increasing mucociliary transport rates, decreasing the viscoelastic properties of mucus, and reducing bacterial viability. Multimechanistic targeting of biofilm infections may ultimately result in improved clinical outcomes, and the results of this study may be translated into future in vivo infection models.

Conflict of interest statement

No authors have competing interest.

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doi: 10.1007/s11739-024-03567-x. Online ahead of print.

Antibiotics in COPD exacerbations requiring mechanical ventilation: a dogma to be re-evaluated

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Affiliations expand

- PMID: 38393502

- DOI: 10.1007/s11739-024-03567-x

No abstract available

- 5 references

SUPPLEMENTARY INFO

Publication typesexpand

FULL TEXT LINKS

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The diagnostic performance of Cr/CysC for sarcopenia and its predictive value on clinical outcomes in hospitalized older patients: a prospective cohort study

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Affiliations expand

- PMID: 38393457

- DOI: 10.1007/s41999-024-00948-5

Abstract

Purpose: The utilization of the creatinine-to-cystatin C ratio (Cr/CysC) represents an innovative method for predicting sarcopenia. Our objectives encompassed the evaluation of sarcopenia diagnostic accuracy for Cr/CysC, SARC-F, SARC-CalF, the combination of Cr/CysC and SARC-CalF, and the Ishii score, as well as an exploration of the predictive value of Cr/CysC concerning clinical outcomes within hospitalized older individuals.

Methods: We employed receiver operating characteristic (ROC) curves and calculated areas under the curves (AUCs) to assess the diagnostic accuracy. Furthermore, we applied univariate and multivariate Cox proportional-hazard models to calculate the hazard ratio (HR) and 95% confidence interval (CI) of risk factors affecting prognosis.

Results: Our study included 312 participants, comprising 167 men and 145 women, with an average age of 71 years. Among males, the AUCs for Cr/CysC, SARC-F, SARC-CalF, the combination of Cr/CysC and SARC-CalF, and the Ishii score were 0.717 [95% CI 0.642-0.784], 0.669 (95% CI 0.592-0.739), 0.845 (95% CI 0.781-0.896), 0.882 (95% CI 0.823-0.926), and 0.938 (95% CI 0.890-0.969), respectively. In females, the AUCs for Cr/CysC, SARC-F, SARC-CalF, the combination of Cr/CysC and SARC-CalF, and the Ishii score were 0.706 (95% CI 0.625-0.779), 0.631 (95% CI 0.547-0.710), 0.763 (95% CI 0.686-0.830), 0.789 (95% CI 0.714-0.853), and 0.898 (95% CI 0.837-0.942), respectively. After adjusting for age, sex,

physical exercise, smoking, drinking, hypertension, coronary heart disease (CHD), chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD), and cancer, sarcopenia identified by Cr/CysC (adjusted HR = 2.176, 95% CI 1.062-4.460, P = 0.034) was independently associated with poor overall survival in hospitalized older patients.

Conclusions: Cr/CysC has satisfactory diagnostic accuracy for sarcopenia diagnosis and predictive value for poor outcomes in hospitalized older patients. The combination of Cr/CysC and SARC-CalF may provide a more accurate screening for sarcopenia and the Ishii score may be the most accurate clinical method for detecting sarcopenia.

Keywords: Adverse outcomes; Creatinine; Cystatin C; Diagnosis; Sarcopenia.

- 36 references

SUPPLEMENTARY INFO

Grants and fundingexpand

FULL TEXT LINKS

Proceed to details

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4

Randomized Controlled Trial

J Glob Health

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. 2024 Feb 23:14:04049.

doi: 10.7189/jogh.14.04049.

Development and validation of a nomogram model for mortality prediction in stable chronic obstructive pulmonary disease patients: A prospective observational study in the RealDTC cohort

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Affiliations expand

- PMID: 38385363

- DOI: 10.7189/jogh.14.04049

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is the third leading cause of death worldwide. There is no nomogram model available for mortality prediction of stable COPD. We intended to develop and validate a nomogram model to predict mortality risk in stable COPD patients for personalised prognostic assessment.

Methods: A prospective observational study was made of COPD outpatients registered in the RealDTC study between December 2016 and December 2019. Patients were randomly assigned to the training cohort and validation cohort in a ratio of 7:3. We used Lasso regression to screen predicted variables. Further, we evaluated the prognostic performance using the area under the time-dependent receiver operating characteristic curve (AUC) and calibration curve. We used the AUC, concordance index, and decision curve analysis to evaluate the net benefits and utility of the nomogram compared with three earlier prediction models.

Results: Of 2499 patients, the median follow-up was 38 months. The characteristics of the patients between the training cohort (n = 1743) and the validation cohort (n = 756) were similar. ABEODS nomogram model, combining age, body mass index, educational level, airflow obstruction, dyspnoea, and severe exacerbation in the first year, was constructed to predict mortality in stable COPD patients. In the integrative analysis of training and

validation cohorts of the nomogram model, the three-year mortality prediction achieved AUC = 0.84; 95% confidence interval (CI) = 0.81, 0.88 and AUC = 0.80; 95% CI = 0.74, 0.86, respectively. The ABEODS nomogram model preserved excellent calibration in both the training cohort and validation cohort. The time-dependent AUC, concordance index, and net benefit of the nomogram model were higher than those of BODEx, updated ADO, and DOSE, respectively.

Conclusions: We developed and validated a prognostic nomogram model that accurately predicts mortality across the COPD severity spectrum. The proposed ABEODS nomogram model performed better than earlier models, including BODEx, updated ADO, and DOSE in Chinese patients with COPD.

Registration: ChiCTR-POC-17010431.

Conflict of interest statement

Disclosure of interest: The authors completed the ICMJE Disclosure of Interest Form (available upon request from the corresponding author) and disclose no relevant interests.

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Calcium Signaling in Airway Epithelial Cells: Current Understanding and Implications for Inflammatory Airway Disease

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Affiliations expand

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- DOI: 10.1161/ATVBAHA.123.318339

Abstract

Airway epithelial cells play an indispensable role in protecting the lung from inhaled pathogens and allergens by releasing an array of mediators that orchestrate inflammatory and immune responses when confronted with harmful environmental triggers. While this process is undoubtedly important for containing the effects of various harmful insults, dysregulation of the inflammatory response can cause lung diseases including asthma, chronic obstructive pulmonary disease, and pulmonary fibrosis. A key cellular mechanism that underlies the inflammatory responses in the airway is calcium signaling, which stimulates the production and release of chemokines, cytokines, and prostaglandins from the airway epithelium. In this review, we discuss the role of major Ca^{2+} signaling pathways found in airway epithelial cells and their roles in mediating airway inflammation, mucociliary clearance, and surfactant production. We highlight the importance of store-operated Ca^{2+} entry as a major signaling hub in these processes and discuss therapeutic implications of targeting Ca^{2+} signaling for airway inflammation.

Keywords: asthma; chemokine; cytokine; epithelium; inflammation.

6

Eur Respir J

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Associations of combined phenotypic ageing and genetic risk with incidence of chronic respiratory diseases in the UK Biobank: a prospective cohort study

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- PMCID: PMC10882326
- DOI: 10.1183/13993003.01720-2023

Free PMC article

Abstract

Background: Accelerated biological ageing has been associated with an increased risk of several chronic respiratory diseases. However, the associations between phenotypic age, a

new biological age indicator based on clinical chemistry biomarkers, and common chronic respiratory diseases have not been evaluated.

Methods: We analysed data from 308 592 participants at baseline in the UK Biobank. The phenotypic age was calculated from chronological age and nine clinical chemistry biomarkers, including albumin, alkaline phosphatase, creatinine, glucose, C-reactive protein, lymphocyte percent, mean cell volume, red cell distribution width and white blood cell count. Furthermore, phenotypic age acceleration (PhenoAgeAccel) was calculated by regressing phenotypic age on chronological age. The associations of PhenoAgeAccel with incident common chronic respiratory diseases and cross-sectional lung function were investigated. Moreover, we constructed polygenic risk scores and evaluated whether PhenoAgeAccel modified the effect of genetic susceptibility on chronic respiratory diseases and lung function.

Results: The results showed significant associations of PhenoAgeAccel with increased risk of idiopathic pulmonary fibrosis (IPF) (hazard ratio (HR) 1.52, 95% CI 1.45-1.59), COPD (HR 1.54, 95% CI 1.51-1.57) and asthma (HR 1.18, 95% CI 1.15-1.20) per 5-year increase and decreased lung function. There was an additive interaction between PhenoAgeAccel and the genetic risk for IPF and COPD. Participants with high genetic risk and who were biologically older had the highest risk of incident IPF (HR 5.24, 95% CI 3.91-7.02), COPD (HR 2.99, 95% CI 2.66-3.36) and asthma (HR 2.07, 95% CI 1.86-2.31). Mediation analysis indicated that PhenoAgeAccel could mediate 10~20% of the associations between smoking and chronic respiratory diseases, while ~10% of the associations between particulate matter with aerodynamic diameter <2.5 μm and the disorders were mediated by PhenoAgeAccel.

Conclusion: PhenoAgeAccel was significantly associated with incident risk of common chronic respiratory diseases and decreased lung function and could serve as a novel clinical biomarker.

Conflict of interest statement

Conflict of interest: The authors declare no competing interests according to the ERS conflicts of interest policy.

- 50 references
- 3 figures

7

BMJ Open Respir Res

. 2024 Feb 21;11(1):e002037.

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Chronic obstructive pulmonary disease trajectory: severe exacerbations and dynamic change in health-related quality of life

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- DOI: 10.1136/bmjresp-2023-002037

Free PMC article

Abstract

Background: The life trajectory of chronic obstructive pulmonary disease (COPD) remains unknown.

Patients and methods: We collected data from two populations. In the first cohort, we recruited 375 patients with COPD from our hospital, and 1440 repeated assessments of

quality of life (QoL) using the European Quality of Life-5 Dimensions questionnaire from 2006 to 2020. We analysed their dynamic changes using the kernel-smoothing method. The second cohort comprised 27 437 patients from the National Health Insurance (NHI) dataset with their first severe acute exacerbations (AEs) requiring hospitalisation from 2008 to 2017 were analysed for their long-term course of AEs. We employed a Cox hazard model to analyse the predictors for mortality or AEs.

Results: Cohorts from our hospital and NHI were male predominant (93.6 and 83.5%, respectively). After the first severe AE, the course generally comprised three phases. The first was a 1-year period of elevated QoL, followed by a 2-year prolonged stable phase with a slowly declining QoL. After the second AE, the final phase was characterised by a rapid decline in QoL. For NHI cohort, 2712 died during the 11-year follow-up, the frequency of the first AE was approximately 5 per 10 000 per day. The median time from the first to the second AE was 3 years, which decreased to less than 6 and 3 months from 4th to 5th and 8th to 9th AE, respectively. The frequency of AE was increased 10-fold and 15-fold and risk of subsequent AE was increased 12-fold and 20-fold after the 6th and the 10th AE, relative to the first. Male gender, heart failure comorbidities were associated with the risk of subsequent AE and death.

Conclusions: The life trajectory of COPD includes the accelerated frailty phase, as well as elevated health and prolonged stable phase after the first AE.

Keywords: COPD Exacerbations; COPD epidemiology; Emphysema.

Conflict of interest statement

Competing interests: None declared.

- 25 references
- 3 figures

8

Int J Occup Med Environ Health

. 2024 Feb 21:177286.

doi: 10.13075/ijomeh.1896.02197. Online ahead of print.

The association between air pollutions and emergency hospitalizations due to COPD and asthma across 16 Polish cities: population-based study

Monika Ścibor[1], Katarzyna Leoszkiewicz[2], Agnieszka Micek[3], Karol Chomoncik[4], Katarzyna Dubas-Jakóbczyk[5], Ewa Kocot[5], Agata Bąk[2], Jolanta Kucińska[2], Dominik Dziurda[2], Roman Roman Topór-Mądry[2,6]

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- PMID: 38385199

- DOI: 10.13075/ijomeh.1896.02197

Abstract

Objectives: In recent years numerous initiatives aimed at reducing air pollution have been undertaken in Poland. The general objective was to examine the correlation between air pollution measured by the level of particulate matter ≤10 µm in diameter (PM_{10}) and emergency hospitalizations due to chronic obstructive pulmonary disease (COPD) and asthma in 16 Polish cities (capitals of the regions).

Material and methods: The authors aimed to diagnose the situation across 16 cities over a 5-year period (2014-2019). Data on the number of hospitalizations was retrieved from the national public insurance system, the National Health Fund. A total number of 22 600 emergency hospitalizations was analyzed (12 000 and 10 600 in 2014 and 2019, respectively). The data on air pollution was accessed via the public register of the Chief Inspectorate for Environmental Protection air quality database. The authors of this article have used the data on PM_{10} daily exposure in each of the 16 cities in 2014 and 2019.

Statistical methods included: non-parametric tests, a 2-stage modelling approach for time-series data, and multivariate meta-analysis of the results.

Results: The results indicated that there was a statistically significant decrease in PM_{10} concentration in 2019 in comparison to 2014 in all cities, mainly in the autumn and winter season. However, the correlation between the improvement in the air quality and a decrease in emergency hospitalizations due to asthma and COPD turned out to not be as strong as expected. The authors observed a strong correlation between PM_{10} concentrations and hospitalizations due to asthma and COPD, but only when air quality norms were significantly above acceptable levels.

Conclusions: Air pollution measured by PM_{10} concentration might be used as one of the predictors of the asthma and COPD emergency hospitalization risk, yet other factors like respiratory tract infection, health care organizational aspect, patient self-control, compliance and comorbidities should also be taken into consideration. Int J Occup Med Environ Health. 2024;37(1).

Keywords: COPD; PM 10; air pollutions; asthma; emergency hospitalizations; environmental health.

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J Health Econ Outcomes Res

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Effectiveness, Safety, and Costs of Thromboprophylaxis with Enoxaparin

or Unfractionated Heparin Among Medical Inpatients With Chronic Obstructive Pulmonary Disease or Heart Failure

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Affiliations expand

- PMID: 38390025
- PMCID: PMC10883471
- DOI: 10.36469/001c.92408

Abstract

Background: Chronic obstructive pulmonary disease (COPD) and heart failure (HF) are risk factors for venous thromboembolism (VTE). Enoxaparin and unfractionated heparin (UFH) help prevent hospital-associated VTE, but few studies have compared them in COPD or HF. **Objectives:** To compare effectiveness, safety, and costs of enoxaparin vs UFH thromboprophylaxis in medical inpatients with COPD or HF. **Methods:** This retrospective cohort study included adults with COPD or HF from the Premier PINC AI Healthcare Database. Included patients received prophylactic-dose enoxaparin or UFH during a >6-day index hospitalization (the first visit/admission that met selection criteria during the study period) between January 1, 2010, and September 30, 2016. Multivariable regression models assessed independent associations between exposures and outcomes. Hospital costs were adjusted to 2017 US dollars. Patients were followed 90 days postdischarge (readmission period). **Results:** In the COPD cohort, 114 174 (69%) patients received enoxaparin and 51 011 (31%) received UFH. Among patients with COPD, enoxaparin recipients had 21%, 37%, and 10% lower odds of VTE, major bleeding, and in-hospital mortality during index admission, and 17% and 50% lower odds of major bleeding and heparin-induced thrombocytopenia (HIT) during the readmission period, compared with UFH recipients (all P <.006). In the HF cohort, 58 488 (58%) patients received enoxaparin and 42 726 (42%) received UFH. Enoxaparin recipients had 24% and 10% lower odds of major bleeding and in-hospital mortality during index admission, and 13%, 11%, and 51% lower odds of VTE, major bleeding, and HIT during readmission (all P <.04) compared with UFH recipients. Enoxaparin recipients also had significantly lower total hospital costs

during index admission (mean reduction per patient: COPD, 1280;HF,1280;��,2677) and readmission (COPD, 379;HF,379;��,1024). Among inpatients with COPD or HF, thromboprophylaxis with enoxaparin vs UFH was associated with significantly lower odds of bleeding, mortality, and HIT, and with lower hospital costs. **Conclusions:** This study suggests that thromboprophylaxis with enoxaparin is associated with better outcomes and lower costs among medical inpatients with COPD or HF based on real-world evidence. Our findings underscore the importance of assessing clinical outcomes and side effects when evaluating cost-effectiveness.

Keywords: bleeding; chronic heart failure; chronic obstructive pulmonary disease; cost analysis; enoxaparin; heparin; medical inpatients; thromboprophylaxis.

Conflict of interest statement

A.K. and N.R. are employees and shareholders of Premier Inc. K.S. and W.N. are employees and shareholders of Sanofi. A.A. has been a principal investigator or co-investigator of clinical trials sponsored by NIH/NIAID, NeuroRx Pharma, Pulmotect, Blade Therapeutics, Novartis, Takeda, Humanigen, Eli Lilly, PTC Therapeutics, OctaPharma, Fulcrum Therapeutics, and Alexion, and a speaker and/or consultant for Pfizer, Salix, Alexion, AstraZeneca, Bayer, Ferring, Seres, Spero, Eli Lilly, Nova Nordisk, Gilead, Renibus, GSK, Dexcom, HeartRite, and Aseptiscope; these relationships are unrelated to the current work.

- 81 references
- 1 figure

. 2024 Feb 20;25(1):93.

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MiR-23a-5p alleviates chronic obstructive pulmonary disease through targeted regulation of RAGE-ROS pathway

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Affiliations expand

- PMID: 38378600

- PMCID: PMC10880325

- DOI: 10.1186/s12931-024-02736-y

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is a common respiratory disease and represents the third leading cause of death worldwide. This study aimed to investigate miRNA regulation of Receptor for Advanced Glycation End-products (RAGE), a causal receptor in the pathogenesis of cigarette smoke (CS)-related COPD, to guide development of therapeutic strategies.

Methods: RAGE expression was quantified in lung tissue of COPD patients and healthy controls, and in mice with CS-induced COPD. RNA-sequencing of peripheral blood from COPD patients with binding site prediction was used to screen differentially expressed miRNAs that may interact with RAGE. Investigation of miR-23a-5p as a potential regulator of COPD progression was conducted with miR-23a-5p agomir in COPD mice in vivo using histology and SCIREQ functional assays, while miR-23a-5p mimics or RAGE inhibitor were applied in 16-HBE human bronchial epithelial cells in vitro. RNA-sequencing, ELISA, and standard molecular techniques were used to characterize downstream signaling pathways in COPD mice and 16-HBE cells treated with cigarette smoke extract (CSE).

Results: RAGE expression is significantly increased in lung tissue of COPD patients, COPD model mice, and CSE-treated 16-HBE cells, while inhibiting RAGE expression significantly reduces COPD severity in mice. RNA-seq analysis of peripheral blood from COPD patients identified miR-23a-5p as the most significant candidate miRNA interaction partner of RAGE, and miR-23a-5p is significantly downregulated in mice and cells treated with CS or CSE, respectively. Injection of miR-23a-5p agomir leads to significantly reduced airway inflammation and alleviation of symptoms in COPD mice, while overexpressing miR-23a-5p leads to improved lung function. RNA-seq with validation confirmed that reactive oxygen species (ROS) signaling is increased under CSE-induced aberrant upregulation of RAGE, and suppressed in CSE-stimulated cells treated with miR-23a-5p mimics or overexpression. ERK phosphorylation and subsequent cytokine production was also increased under RAGE activation, but inhibited by increasing miR-23a-5p levels, implying that the miR-23a-5p/RAGE/ROS axis mediates COPD pathogenesis via ERK activation.

Conclusions: This study identifies a miR-23a-5p/RAGE/ROS signaling axis required for pathogenesis of COPD. MiR-23a-5p functions as a negative regulator of RAGE and downstream activation of ROS signaling, and can inhibit COPD progression in vitro and in vivo, suggesting therapeutic targets to improve COPD treatment.

Keywords: COPD; Cigarette smoke; RAGE; ROS; miR-23a-5p.

Conflict of interest statement

The authors declare that there is no commercial or profit relationship in this study.

- 34 references
- 6 figures

11

Thorax

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Mucus clears from the trachea in a helix: a new twist to understanding airway diseases

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Affiliations expand

- PMID: 38378235

- DOI: 10.1136/thorax-2023-221052

Abstract

Background: Mucociliary clearance (MCC) is critical to lung health and is impaired in many diseases. The path of MCC may have an important impact on clearance but has never been rigorously studied. The objective of this study is to assess the three-dimensional path of human tracheal MCC in disease and health.

Methods: Tracheal MCC was imaged in 12 ex-smokers, 3 non-smokers (1 opportunistically imaged during acute influenza and repeated after recovery) and 5 individuals with primary ciliary dyskinesia (PCD). Radiolabelled macroaggregated albumin droplets were injected into the trachea via the cricothyroid membrane. Droplet movement was tracked via scintigraphy, the path of movement mapped and helical and axial models of tracheal MCC were compared.

Measurements and main results: In 5/5 participants with PCD and 1 healthy participant with acute influenza, radiolabelled albumin coated the trachea and did not move. In all others (15/15), mucus coalesced into globules. Globule movement was negligible in 3 ex-smokers, but in all others (12/15) ascended the trachea in a helical path. Median cephalad tracheal MCC was 2.7 mm/min ex-smokers vs 8.4 mm/min non-smokers (p=0.02) and

correlated strongly to helical angle (r=0.92 (p=0.00002); median 18◦ ex-smokers, 47◦ non-smokers (p=0.036)), but not to actual speed on helical path (r=0.26 (p=0.46); median 13.6 mm/min ex-smokers vs 13.9 mm/min non-smokers (p=1.0)).

Conclusion: For the first time, we show that human tracheal MCC is helical, and impairment in ex-smokers is often caused by flattened helical transit, not slower movement. Our methodology provides a simple method to map tracheal MCC and speed in vivo.

Keywords: Airway Epithelium; Bronchiectasis; COPD Pathology; Imaging/CT MRI etc; Lung Physiology; Primary ciliary dyskinesia.

Conflict of interest statement

Competing interests: None declared.

12

Postgrad Med J

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Body composition, pulmonary function tests, exercise capacity, and quality of

life in chronic obstructive pulmonary disease patients with obesity

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Affiliations expand

- PMID: 38377471

- DOI: 10.1093/postmj/qgae024

Abstract

Purpose of the study: Larger proportions of chronic obstructive pulmonary disease (COPD) patients are currently overweight or with obesity than underweight, and the combination of COPD and obesity is increasing. The purpose of this study was to investigate differences in the body composition, pulmonary function tests, exercise capacity, and health-related quality of life among normal weight, overweight, and obese patients with COPD.

Study design: A total of 514 patients with COPD were included in the study. According to the World Health Organization criteria for body mass index, the patients were classified as normal weight, overweight, and obese. Evaluations included fat-free mass, fat-free mass index, phase angle, pulmonary function tests, and 6-minute walk test. Dyspnea was assessed using the modified Medical Research Council dyspnea scale, and the health-related quality of life was evaluated using COPD Assessment Test and St. George's Respiratory Questionnaire. Values were compared among the three groups.

Results: There were 315 male and 199 female patients, with a mean age of 66.7 ± 8.4 years. Fat-free mass, fat-free mass index, and phase angle values were significantly higher in COPD patients with obesity than in other patients ($P < .001$, $P < .001$, $P < .001$). Forced expiratory volume in 1 s, forced expiratory volume in 1 s/forced vital capacity, and diffusing capacity of lung for carbon monoxide value in pulmonary function tests were significantly higher in COPD patients with obesity than in other patients ($P = .046$, $P < .001$, $P < .001$), while the forced vital capacity values were similar in all groups. Exercise capacity (6-min walk test distance), dyspnea symptoms (modified Medical Research Council scale), and health-related quality of life (COPD Assessment Test and St. George's Respiratory Questionnaire) did not differ significantly between groups.

Conclusions: According to our study, obesity has no negative effect on pulmonary function tests, dyspnea perception, exercise capacity, and health-related quality of life.

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Nat Commun

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Causes of death among people living with metastatic cancer

Kyle Mani[1,2], Daxuan Deng[3], Christine Lin[4,2], Ming Wang[5], Melinda L Hsu[6], Nicholas G Zaorsky[7]

Affiliations expand

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- PMCID: PMC10876661
- DOI: 10.1038/s41467-024-45307-x

Free PMC article

Abstract

Studying survivorship and causes of death in patients with advanced or metastatic cancer remains an important task. We characterize the causes of death among patients with metastatic cancer, across 13 cancer types and 25 non-cancer causes and predict the risk of death after diagnosis from the diagnosed cancer versus other causes (e.g., stroke, heart disease, etc.). Among 1,030,937 US (1992-2019) metastatic cancer survivors, 82.6% of patients (n = 688,529) died due to the diagnosed cancer, while 17.4% (n = 145,006) died of competing causes. Patients with lung, pancreas, esophagus, and stomach tumors are the most likely to die of their metastatic cancer, while those with prostate and breast cancer have the lowest likelihood. The median survival time among patients living with metastases is 10 months; our Fine and Gray competing risk model predicts 1 year survival with area under the receiver operating characteristic curve of 0.754 (95% CI [0.754, 0.754]). Leading non-cancer deaths are heart disease (32.4%), chronic obstructive and pulmonary disease (7.9%), cerebrovascular disease (6.1%), and infection (4.1%).

Conflict of interest statement

The authors declare no competing interests.

- 59 references
- 5 figures

SUPPLEMENTARY INFO

MeSH termsexpand

FULL TEXT LINKS

Editorial

Thorax

. 2024 Feb 19:thorax-2023-221329.

doi: 10.1136/thorax-2023-221329. Online ahead of print.

Type-2 inflammation: a key treatable trait associated with lung function decline in chronic airways disease

Nayia Petousi[1], Ian D Pavord[2], Brian Daniel Kent[3]

Affiliations expand

- PMID: 38373823

- DOI: 10.1136/thorax-2023-221329

No abstract available

Keywords: Asthma; COPD epidemiology.

Conflict of interest statement

Competing interests: None declared.

SUPPLEMENTARY INFO

Publication typesexpand

FULL TEXT LINKS

15

Tuberc Respir Dis (Seoul)

.
. 2024 Feb 19.

doi: 10.4046/trd.2023.0176. Online ahead of print.

Inhaled Corticosteroids May Not Affect the Clinical Outcomes of Pneumonia in Patients with Chronic Obstructive Pulmonary Disease

Min-Seok Chang[1], In-So Cho[1], Iseul Yu[1], Sunmin Park[1], Seok Jeong Lee[1], Suk Joong Yong[1], Won-Yeon Lee[1], Sang-Ha Kim[1], Ji-Ho Lee[1]

Affiliations expand

- PMID: 38369876

- DOI: 10.4046/trd.2023.0176

Abstract

Background: Although inhaled corticosteroids (ICS) is reportedly associated with a higher risk of pneumonia in chronic obstructive pulmonary disease (COPD), the clinical implications of ICS have not been sufficiently verified to determine their effect on the prognosis of pneumonia.

Methods: The electronic health records of patients hospitalized for pneumonia with underlying COPD were retrospectively reviewed. Pneumonia was confirmed using chest radiography or computed tomography. The clinical outcomes of pneumonia in patients with COPD who received ICS and those who received long-acting bronchodilators other than ICS were compared.

Results: Among the 255 hospitalized patients, 89 met the inclusion criteria. The numbers of ICS and non-ICS users were 46 and 43, respectively. The CURB-65 scores at the initial presentation of pneumonia were comparable between the two groups. The proportions of patients with multilobar infiltration, pleural effusion, and complicated pneumonia in the

radiological studies did not vary between the two groups. Additionally, the defervescence time, proportion of mechanical ventilation, intensive care unit admission, length of hospital stays, and mortality rate at 30 and 90 days were not significantly different between the two groups. ICS use and blood eosinophils count were not associated with all pneumonia outcomes and mortality in multivariate analyses.

Conclusion: The clinical outcomes of pneumonia following ICS use in patients with COPD did not differ from those in patients treated without ICS. Thus, ICS may not contribute to the severity and outcomes of pneumonia in patients with COPD.

Keywords: COPD; CURB-65; Inhaled corticosteroid; mortality; pneumonia.

"Multimorbidity"[Mesh Terms] OR Multimorbidity[Text Word]

1
BMJ Open

. 2024 Feb 21;14(2):e079347.

doi: 10.1136/bmjopen-2023-079347.

Mortality and health-related quality of life in older adults with long-term use of opioids, z-hypnotics or benzodiazepines: a prospective observational study at 5 years follow-up

Maria Torheim Bjelkarøy[1,2], Tone Breines Simonsen[3], Tahreem Ghazal Siddiqui[3,2], Socheat Cheng[3,2], Ramune Grambaite[3,4], Jūratė Šaltytė Benth[3,2], Christofer Lundqvist[3,2]

Affiliations expand

- PMID: 38387984

- PMCID: PMC10882342

- DOI: 10.1136/bmjopen-2023-079347

Free PMC article

Abstract

Objectives: Disease and medication use in older age is a consequence of age-related declining health. Multimorbidity followed by polypharmacy is common. Central nervous system depressing (CNSD) drugs such as opioids, benzodiazepines and z-hypnotics are not recommended for long-term use in older adults but are in use by many. We aimed to assess mortality and change in health-related quality of life (HRQoL) in older adults with long-term use of CNSDs.

Method: A prospective observational study was conducted at Akershus University Hospital, Norway, 2017-2019, with follow-up in 2021-2022, including 246 participants aged 65-90. At 5-year follow-up, 78 (32%) participants had passed away. Mortality data were collected from patient electronic health records. Of the surviving 168 (68%), we collected further follow-up data from 38 (16%) participants. Follow-up included demographic and clinical data. The EuroQuol Group EQ-5D-5L questionnaire was used to measure HRQoL. Analysis include Cox regression model for survival data and linear mixed model for change in HRQoL over time.

Results: At follow-up, 78 (31.7%) were deceased. Mean survival time was 3.3 years. Total time for survival data was 4.7 years. Mortality was higher among participants with long-term use of CNSD (HR 1.9 95% CI (1.2 to 3.2), p=0.01). The multivariable analysis found being older (HR 1.1 95% CI (1.0 to 1.1), p=0.020) and male sex (HR 2.1 95% CI (1.2 to 3.5), p=0.008) to be associated with increased risk of mortality. According to the linear mixed model (n=38), there was no significant difference between surviving users and non-users in change in HRQoL EQ-5D-5L index from baseline to follow-up.

Conclusion: Mortality was higher for long-term users of CNSDs at 5-year follow-up. Being older and male sex were associated with mortality. Among survivors, there was no significant difference between the groups in change of HRQoL over time.

Trial registration number: NCT03162081; 22 May 2017.

Keywords: geriatric medicine; mortality; quality of life.

Conflict of interest statement

Competing interests: CL has participated on an advisory board and received payment for lectures arranged by Abbvie Pharma AS, Novartis AS, Lundbeck AS and Roche AS, Norway. He has also received research sponsorship from Abbvie Pharma. The other authors state no conflict of interest.

- 58 references
- 3 figures

SUPPLEMENTARY INFO

Associated dataexpand

FULL TEXT LINKS

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2

Eur J Intern Med

. 2024 Feb 20:S0953-6205(24)00074-8.

doi: 10.1016/j.ejim.2024.02.018. Online ahead of print.

Patient centered care: A multidisciplinary and holistic approach

Giovambattista Desideri[1], Nicola Montano[2], Giorgio Sesti[3]

Affiliations expand

- PMID: 38378345

- DOI: 10.1016/j.ejim.2024.02.018

No abstract available

Keywords: Holistic approach; Internal medicine; Multidisciplinary approach; Multimorbidity.

Conflict of interest statement

Declaration of competing interest None

SUPPLEMENTARY INFO

Publication typesexpand

FULL TEXT LINKS

"asthma"[MeSH Terms] OR asthma[Text Word]

1
J Investig Allergol Clin Immunol

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. 2024 Feb 23;34(1):60-61.

doi: 10.18176/jiaci.0920. Epub 2023 Jun 21.

Compassionate Use of Reslizumab in a Life-threatening Asthma Exacerbation

P Granda[1], E Villamañán[2,3,4], S Heinz[1], D Laorden[3,5], D Romero[3,6], J M Añón[3,7,8], C Carpio[3,4,5], C Sobrino[2,3], V Collada[2,3], J Domínguez-Ortega[3,8], A Herrero[2,3], S Quirce[8], R Álvarez-Sala[3,4,5]

Affiliations expand

- PMID: 37357596

- DOI: 10.18176/jiaci.0920

Free article
No abstract available

Keywords: Critical care; Reslizumab; Severe asthma.

2

Clin Pharmacol Drug Dev

. 2024 Feb 22.

doi: 10.1002/cpdd.1373. Online ahead of print.

Bioequivalence Between a New Omalizumab Prefilled Syringe With an Autoinjector or with a Needle Safety Device Compared with the Current Prefilled Syringe: A Randomized Controlled Trial in Healthy Volunteers

Ramachandra Sangana[1], Yan Xu[2], Bharti Shah[3], Xianbin Tian[3], Julia Zack[3], Kasra Shakeri-Nejad[4], Sampath Kalluri[5], Ieuan Jones[4], Monica Ligueros-Saylan[3], Angel Fowler Taylor[3], Devendra Kumar Jain[4], Emil Scosyrev[3], Alkaz Uddin[3], Nathalie Laurent[4], Paola Paganoni[3]

Affiliations expand

- PMID: 38389387

- DOI: 10.1002/cpdd.1373

Abstract

Omalizumab is an anti-IgE monoclonal antibody currently approved for the treatment of asthma, nasal polyps/chronic rhinosinusitis with nasal polyps, and chronic spontaneous urticaria. Omalizumab is available as an injection in a prefilled syringe (PFS) with a needle safety device (NSD). New product configurations were developed to reduce the number of injections per dose administration, improve patient convenience and treatment compliance. The objective of this randomized open-label 12-week study was to demonstrate pharmacokinetic bioequivalence between (1) new PFS with autoinjector (PFS-AI), (2) new PFS-NSD configuration, and (3) current PFS-NSD configuration. Each new configuration was considered bioequivalent to the current configuration if the confidence intervals (CIs) for the geometric mean ratios (GMR) were contained in the 0.80-1.25 range for maximum concentration (C_{max}), area under the concentration-time curve until the last quantifiable measurement (AUC_{last}), and AUC extrapolated to infinity (AUC_{inf}). Safety was assessed throughout the study. In total, 193 healthy volunteers were randomized at 1:1:1 ratio to omalizumab 1×300 mg/2 mL via new PFS-AI (n = 66), omalizumab 1×300 mg/2 mL via new PFS-NSD (n = 64), or omalizumab 2×150 mg/1 mL via current PFS-NSD (n = 63). Comparing new PFS-AI versus current PFS-NSD, the GMRs were: C_{max}, 1.085; AUC_{last}, 1.093; AUC_{inf}, 1.100. Comparing new PFS-NSD versus current PFS-NSD, the GMRs were: C_{max}, 1.006; AUC_{last}, 1.016; AUC_{inf}, 1.027. The 95% CIs for all GMR parameters were contained within the 0.80-1.25 range. Safety findings were consistent with the known safety profile of omalizumab. Single-dose omalizumab administered as the new PFS-AI or new PFS-NSD was bioequivalent to the current PFS-NSD.

Keywords: Omalizumab; autoinjector; bioequivalence; pharmacokinetics.

- 24 references

3

Editorial

Thorax

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. 2024 Feb 22:thorax-2023-221360.

doi: 10.1136/thorax-2023-221360. Online ahead of print.

Does ICS treatment increase the risk of pneumonia in asthma?

Christer Janson[1]

Affiliations expand

- PMID: 38388488

- DOI: 10.1136/thorax-2023-221360

No abstract available

Keywords: Asthma; Asthma Pharmacology; Pneumonia.

Conflict of interest statement

Competing interests: CJ has served in an advisory board and/or served as a speaker and/or participated in education arranged from AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Novartis, Orion and TEVA.

Review

Ann N Y Acad Sci

. 2024 Feb 22.

doi: 10.1111/nyas.15112. Online ahead of print.

Pharmacotherapy causing weight gain and metabolic alteration in those with obesity and obesity-related conditions: A review

Chika V Anekwe[1,2], Yoon Ji Ahn[1,2], Simar Singh Bajaj[3], Fatima Cody Stanford[2,4]

Affiliations expand

- PMID: 38385953

- DOI: 10.1111/nyas.15112

Abstract

This review aims to summarize pharmacological interventions that may affect adiposity and metabolic equilibrium in individuals with obesity. Pharmacological therapy is frequently used to treat medical conditions that are both directly related to obesity (such as hypertension and type 2 diabetes) and indirectly related to obesity (such as asthma, insomnia, and type 1 diabetes). This pharmacological therapy may result in weight gain and alterations in the metabolic profile. Many medication classes are implicated in the pharmacologic causes of weight gain, including antipsychotics, glucocorticoids, beta-adrenergic blockers, tricyclic antidepressants, antihistamines, insulin, neuropathic agents, sleep agents, and steroids. This article describes the mechanisms of action and pathways of pharmacological interventions causing obesity.

Keywords: metabolism; obesity; obesity comorbidities; pharmacotherapy; weight gain.

- 92 references

SUPPLEMENTARY INFO

Publication types, Grants and fundingexpand

FULL TEXT LINKS

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5

Eur Respir J

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. 2024 Feb 22;63(2):2301720.

doi: 10.1183/13993003.01720-2023. Print 2024 Feb.

Associations of combined phenotypic ageing and genetic risk with incidence of chronic respiratory diseases in the UK Biobank: a prospective cohort study

Ting Wang[1,2,3], Weiwei Duan[4,5,5], Xinying Jia[2], Xinmei Huang[6], Yi Liu[2,7], Fanqing Meng[1,7], Chunhui Ni[8,3,7]

Affiliations expand

- PMID: 38061785
- PMCID: PMC10882326
- DOI: 10.1183/13993003.01720-2023

Free PMC article

Abstract

Background: Accelerated biological ageing has been associated with an increased risk of several chronic respiratory diseases. However, the associations between phenotypic age, a new biological age indicator based on clinical chemistry biomarkers, and common chronic respiratory diseases have not been evaluated.

Methods: We analysed data from 308 592 participants at baseline in the UK Biobank. The phenotypic age was calculated from chronological age and nine clinical chemistry biomarkers, including albumin, alkaline phosphatase, creatinine, glucose, C-reactive protein, lymphocyte percent, mean cell volume, red cell distribution width and white blood cell count. Furthermore, phenotypic age acceleration (PhenoAgeAccel) was calculated by regressing phenotypic age on chronological age. The associations of PhenoAgeAccel with incident common chronic respiratory diseases and cross-sectional lung function were investigated. Moreover, we constructed polygenic risk scores and evaluated whether PhenoAgeAccel modified the effect of genetic susceptibility on chronic respiratory diseases and lung function.

Results: The results showed significant associations of PhenoAgeAccel with increased risk of idiopathic pulmonary fibrosis (IPF) (hazard ratio (HR) 1.52, 95% CI 1.45-1.59), COPD (HR 1.54, 95% CI 1.51-1.57) and asthma (HR 1.18, 95% CI 1.15-1.20) per 5-year increase and

decreased lung function. There was an additive interaction between PhenoAgeAccel and the genetic risk for IPF and COPD. Participants with high genetic risk and who were biologically older had the highest risk of incident IPF (HR 5.24, 95% CI 3.91-7.02), COPD (HR 2.99, 95% CI 2.66-3.36) and asthma (HR 2.07, 95% CI 1.86-2.31). Mediation analysis indicated that PhenoAgeAccel could mediate 10~20% of the associations between smoking and chronic respiratory diseases, while ~10% of the associations between particulate matter with aerodynamic diameter <2.5 μm and the disorders were mediated by PhenoAgeAccel.

Conclusion: PhenoAgeAccel was significantly associated with incident risk of common chronic respiratory diseases and decreased lung function and could serve as a novel clinical biomarker.

Conflict of interest statement

Conflict of interest: The authors declare no competing interests according to the ERS conflicts of interest policy.

- 50 references
- 3 figures

6

Review

J Investig Allergol Clin Immunol

. 2024 Feb 22;34(1):1-11.

doi: 10.18176/jiaci.0949. Epub 2023 Oct 9.

Positioning of Tezepelumab in Severe Asthma

J C Miralles-López[1,2], D Antolín-Amérigo[2,3,4], I García-Moguel[2,5,6], J Domínguez-Ortega[2,7,8,9], J Delgado-Romero[2,10], S Quirce[2,7,8,9]

Affiliations expand

- PMID: 37812191

- DOI: 10.18176/jiaci.0949

Free article

Abstract

Asthma is one of the most common chronic diseases and is estimated to be severe in 3%-10% of affected patients. There is a need for additional biologic treatments that are highly efficacious across the spectrum of severe uncontrolled asthma. Currently available drugs inhibit 1 or 2 specific cytokines or IgE antibodies and thus only partially suppress the complex type 2 (T2) inflammatory cascade. Biologics targeting more upstream molecules in the pathophysiological pathway of asthma could treat asthma more effectively. Tezepelumab is a human monoclonal immunoglobulin G2λ antibody that targets the cytokine thymic stromal lymphopoietin (TSLP). It is the first marketed biologic against an epithelial cell-derived cytokine, preventing binding of TSLP to its receptor and reducing the immune stimuli that TSLP can trigger in different asthma endotypes. Tezepelumab reduces downstream biomarkers of inflammation, such as blood and airway eosinophils, FeNO, IgE, IL-5, and IL-13. Tezepelumab provides a clinical benefit in severe asthma, reducing the annualized asthma exacerbation rate in patients with either high or low levels of biomarkers of T2 inflammation, although the effect is greater among those with high levels. The drug has been shown to improve asthma control, quality of life, and lung function and reduce airway hyperresponsiveness. Therefore, tezepelumab can be used across the spectrum of patients with severe uncontrolled asthma, especially in T2-high patients. This review includes a positioning statement by the authors, all of whom are members of the SEAIC Asthma Committee.

Keywords: Efficacy; Positioning; Severe asthma; Tezepelumab.

SUPPLEMENTARY INFO

Publication typesexpand

7

Review

J Investig Allergol Clin Immunol

. 2024 Feb 22;34(1):12-19.

doi: 10.18176/jiaci.0923. Epub 2023 Jul 26.

From MASK-air and SILAM to CATALYSE (Climate Action To Advance HeaLthY Societies in Europe)

B Sousa-Pinto[1,2], Y Palamarchuk[3], L Leemann[4], S Jankin[5], X Basagaña[6,7,8,9], J Ballester[6], A Bedbrook[10], W Czarlewski[10,11], R Almeida[1,2,11], T Haahtela[12], H Haveri[13], M Prass[14,15], T Henriques[1,2], R J Vieira[1,2], L Klimek[16,17], M Ollert[18,19,20], M H Shamji[21,22], M Jutel[23,24], S Del Giacco[25], M J Torres[26], T Zuberbier[27,28], J A Fonseca[1,2], M Sofiev[3], J M Anto[6,8,9], J Bousquet[10,27,28,29]

Affiliations expand

- PMID: 37498647

- DOI: 10.18176/jiaci.0923

Free article

Abstract

Plant species vary under different climatic conditions and the distribution of pollen in the air. Trends in pollen distribution can be used to assess the impact of climate change on public health. In 2015, the Mobile Airways Sentinel networK for rhinitis and asthma (MASK-air®) was launched as a project of the European Innovation Partnership on Active and Healthy Ageing (EIP-on-AHA, DG Santé and DG CONNECT). This project aimed to develop a warning system to inform patients about the onset of the pollen season, namely, the System for Integrated modeLling of Atmospheric coMposition (SILAM). A global-to-meso-scale dispersion model was developed by the Finnish Meteorological Institute (FMI). It provides quantitative information on atmospheric pollution of anthropogenic and natural origins, particularly on allergenic pollens. Impact of Air Pollution on Asthma and Rhinitis (POLLAR, EIT Health) has combined MASK-air clinical data with SILAM forecasts. A new Horizon Europe grant (Climate Action to Advance HeaLthY Societies in Europe [CATALYSE]; grant agreement number 101057131), which came into force in September 2022, aims to improve our understanding of climate change and help us find ways to counteractit. One objective of this project is to develop early warning systems and predictive models to improve the effectiveness of strategies for adapting to climate change. One of the warning systems is focused on allergic rhinitis (CATALYSE Task 3.2), with a collaboration between the FMI (Finland), Porto University (Portugal), MASK-air SAS (France), ISGlobal (Spain), Hertie School (Germany), and the University of Zurich (Switzerland). It is to be implemented with the support of the European Academy of Allergy and Clinical Immunology. This paper reports the planning of CATALYSE Task 3.2.

Keywords: CATALYSE; Climate change; MASK-air; Pollen; SILAM.

8

J Investig Allergol Clin Immunol

. 2024 Feb 22;34(1):30-37.

doi: 10.18176/jiaci.0865. Epub 2023 Oct 6.

The Influence of BMI in Asthma: Which Traits Are due to Obesity and Which to the Asthma and Obesity Phenotype?

I Esteban-Gorgojo[1], M P Gorgojo[2], J Sastre[3,4,5], F García-Río[4,5,6,7], S Quirce[4,5,7,8]

Affiliations expand

- PMID: 36200980

- DOI: 10.18176/jiaci.0865

Free article

Abstract

Background and objectives: The characteristics of the asthma and obesity phenotype have been described in cluster studies but have not been subsequently confirmed. Specific characteristics of this phenotype have not been differentiated from those inherent to the patient's body mass index (BMI). This study aims to assess the effect of BMI on asthma in order to identify which traits could define the asthma and obesity phenotype and which are inherent to the patient´s BMI.

Methods: A real-life retrospective observational study was conducted based on data from 2514 patients with suspected asthma collected at the first visit to the allergy clinic between November 2014 and November 2017. All patients had to perform an appropriate spirometry maneuver. All BMI, sex, and age groups were represented.

Results: The influence of BMI on asthma differed according to age group and sex. All spirometry results and FeNO were influenced by BMI. The only notable asthma characteristics were later onset of asthma with higher BMI values. No other differences were found between the BMI groups.

Conclusions: The effect of BMI on asthma is age-dependent; therefore, it should be corrected for age. The most important variations are in FeNO and spirometry results. The specific characteristics of the asthma and obesity phenotype are a greater perception of symptoms with fewer alterations in respiratory function tests and a lower prevalence of atopy, rhinitis, and allergy, including allergic asthma. Other characteristics of this

phenotype, such as a higher female prevalence or late-onset or noneosinophilic asthma, are nonspecific for this phenotype.

Keywords: Asthma; Asthma and obesity; BMI; Obesity; Phenotype; Severe asthma.

- Cited by 1 article

9

Respirology

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. 2024 Feb 21.

doi: 10.1111/resp.14670. Online ahead of print.

Asthma in children–What's in the future

Peter Neils Le Souëf[1]

Affiliations expand

- PMID: 38382966

- DOI: 10.1111/resp.14670

No abstract available

Keywords: air pollution; childhood asthma; climate change; immunomodulation; mechanisms.

- 15 references

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Pediatr Pulmonol

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. 2024 Feb 21.

doi: 10.1002/ppul.26935. Online ahead of print.

Time-dependent gene-environment interactions are essential drivers of asthma initiation and persistence

Grigorios Chatziparasidis[1,2], Maria R Chatziparasidi[3], Ahmad Kantar[4,5], Andrew Bush[6]

Affiliations expand

- PMID: 38380964

- DOI: 10.1002/ppul.26935

Abstract

Asthma is a clinical syndrome caused by heterogeneous underlying mechanisms with some of them having a strong genetic component. It is known that up to 82% of atopic asthma has a genetic background with the rest being influenced by environmental factors that cause epigenetic modification(s) of gene expression. The interaction between the gene(s) and the environment has long been regarded as the most likely explanation of asthma

initiation and persistence. Lately, much attention has been given to the time frame the interaction occurs since the host response (immune or biological) to environmental triggers, differs at different developmental ages. The integration of the time variant into asthma pathogenesis is appearing to be equally important as the gene(s)-environment interaction. It seems that, all three factors should be present to trigger the asthma initiation and persistence cascade. Herein, we introduce the importance of the time variant in asthma pathogenesis and emphasize the long-term clinical significance of the time-dependent gene-environment interactions in childhood.

Keywords: asthma; environment; gene; pathogenesis; time.

11

Chest

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. 2024 Feb 20:S0012-3692(24)00261-7.

doi: 10.1016/j.chest.2024.02.026. Online ahead of print.

CT Imaging Assessment of Response to Treatment in Allergic Bronchopulmonary Aspergillosis in Adults With Bronchial Asthma

Cendrine Godet[1], Anne-Laure Brun[2], Francis Couturaud[3], François Laurent[4], Jean-Pierre Frat[5], Sylvain Marchand-Adam[6], Frédéric Gagnadoux[7], Elodie Blanchard[8], Camille Taillé[9], Bruno

Philippe[10], Sandrine Hirschi[11], Claire Andréjak[12], Arnaud Bourdin[13], Cécile Chenivesse[14], Stéphane Dominique[15], Gilles Mangiapan[16], Marlène Murris-Espin[17], Frédéric Rivière[18], Gilles Garcia[19], François-Xavier Blanc[20], François Goupil[21], Anne Bergeron[22], Thomas Flament[23], Pascaline Priou[7], Hervé Mal[24], Joe de Keizer[25], Stéphanie Ragot[25], Jacques Cadranel[26]; NebuLamB* study group and GREPI network

Collaborators, Affiliations expand

- PMID: 38387646

- DOI: 10.1016/j.chest.2024.02.026

Abstract

Background: One of the major challenges in managing allergic bronchopulmonary aspergillosis (ABPA) remains consistent and reproducible assessment of response to treatment.

Research question: What are the most relevant changes in computed tomography (CT-scan) parameters over time for assessing response to treatment?

Study design and methods: In this ancillary study of a randomized clinical trial (NEBULAMB), asthmatic patients with available CT-scan and without exacerbation during a 4-month ABPA exacerbation treatment period (corticosteroids and itraconazole) were included. Changed CT-scan parameters were assessed by systematic analyses of CT-scan findings at initiation (M0) and end of treatment (M4). CT-scans were assessed by two radiologists blinded to the clinical data. Radiological parameters were determined by selecting those showing significant changes over time. Improvement of at least one, without worsening of the others, defined the radiological response. Agreement between radiological changes, clinical and immunologic responses was likewise investigated.

Results: Among the 139 originally randomized patients, 132 were included. We identified 5 CT-scan parameters showing significant changes at M4: mucoid impaction extent, mucoid impaction density, centrilobular micronodules, consolidation/ground-glass opacities and bronchial wall thickening ($P<0.05$). These changes were only weakly associated with one another, except for mucoid impaction extent and density. No agreement was observed between clinical or immunologic and radiological responses, assessed as an overall response, or considering each of the parameters (Cohen's κ, -0.01 to 0.24).

Interpretation: Changes in extent and density of mucoid impactions, centrilobular micronodules, consolidation/ground-glass opacities and thickening of the bronchial walls were found to be the most relevant CT-scan parameters to assess radiological response to treatment. A clinical, immunologic and radiological multidimensional approach should be

adopted to assess outcomes, probably with a composite definition of response to treatment.

Keywords: ABPA; Allergic Bronchopulmonary Aspergillosis; CT; computed tomography; radiological response; treatment outcomes.

12

Sci Total Environ

. 2024 Feb 20:171102.

doi: 10.1016/j.scitotenv.2024.171102. Online ahead of print.

Machine learning-driven identification of air toxic combinations associated with asthma symptoms among elementary school children in Spokane, Washington, USA

Solmaz Amiri [1], Yan-Chak Li [2], Dedra Buchwald [3], Gaurav Pandey [2]

Affiliations expand

- PMID: 38387571

- DOI: 10.1016/j.scitotenv.2024.171102

Abstract

Air toxics are atmospheric pollutants with hazardous effects on health and the environment. Although methodological constraints have limited the number of air toxics assessed for associations with health and disease, advances in machine learning (ML) enable the assessment of a much larger set of environmental exposures. We used ML methods to conduct a retrospective study to identify combinations of 109 air toxics associated with asthma symptoms among 269 elementary school students in Spokane, Washington. Data on the frequency of asthma symptoms for these children were obtained from Spokane Public Schools. Their exposure to air toxics was estimated by using the Environmental Protection Agency's Air Toxics Screening Assessment and National Air Toxics Assessment. We defined three exposure periods: the most recent year (2019), the last three years (2017-2019), and the last five years (2014-2019). We analyzed the data using the ML-based Data-driven ExposurE Profile (DEEP) extraction method. DEEP identified 25 air toxic combinations associated with asthma symptoms in at least one exposure period. Three combinations (1,1,1-trichloroethane, 2-nitropropane, and 2,4,6-trichlorophenol) were significantly associated with asthma symptoms in all three exposure periods. Four air toxics (1,1,1-trichloroethane, 1,1,2,2-tetrachloroethane, BIS (2-ethylhexyl) phthalate (DEHP), and 2,4-dinitrophenol) were associated only in combination with other toxics, and would not have been identified by traditional statistical methods. The application of DEEP also identified a vulnerable subpopulation of children who were exposed to 13 of the 25 significant combinations in at least one exposure period. On average, these children experienced the largest number of asthma symptoms in our sample. By providing evidence on air toxic combinations associated with childhood asthma, our findings may contribute to the regulation of these toxics to improve children's respiratory health.

Keywords: Air toxic; Childhood asthma; Geographic information systems; Machine learning; Socioeconomic status.

13

Comput Biol Med

. 2024 Feb 20:171:108190.

doi: 10.1016/j.compbiomed.2024.108190. Online ahead of print.

Comparative study of respiratory sounds classification methods based on cepstral analysis and artificial neural networks

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Affiliations expand

- PMID: 38387384

- DOI: 10.1016/j.compbiomed.2024.108190

Abstract

In this paper, we investigated and evaluated various machine learning-based approaches for automatically detecting wheezing sounds. We conducted a comprehensive comparison of these proposed systems, assessing their classification performance through metrics such as Sensitivity, Specificity, and Accuracy. The main approach to developing a machine learning-based system for classifying respiratory sounds involved the combination of a technique for extracting features from an unknown input sound with a classification method to determine its belonging class. The characterization techniques used in this study are based on the cepstral analysis, which was extensively employed in the automatic speech recognition field. While MFCC (Mel-Frequency Cepstral Coefficients) feature extraction methods are commonly used in respiratory sounds classification, our study introduces a novelty by employing GFCC (Gammatone-Frequency Cepstral Coefficients) and BFCC (Bark-Frequency Cepstral Coefficients) for this purpose. For the classification task, we employed two types of neural networks: the MLP (Multilayer Perceptron), a feedforward neural network, and a variant of the LSTM (Long Short-Term Memory) recurrent neural network called BiLSTM (Bidirectional LSTM). The proposed classification systems are evaluated using a database consisting of 497 wheezing segments and 915

normal respiratory segments, which are recorded from individuals diagnosticated with asthma and individuals without any respiratory issues, respectively. The highest classification performance was achieved by the BFCC-BiLSTM model, which demonstrated an exceptional accuracy rate of 99.8%.

Keywords: BFCC; BiLSTM; Cepstral analysis; Deep learning; GFCC; LSTM; MFCC; MLP; Machine learning; Neural networks; Respiratory sound; Wheezing.

Conflict of interest statement

Declaration of competing interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

14

ERJ Open Res

. 2024 Feb 19;10(1):00652-2023.

doi: 10.1183/23120541.00652-2023. eCollection 2024 Jan.

Aberrant characteristics of peripheral blood innate lymphoid cells in COPD, independent of smoking history

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Uden[2], Ralph Stadhouders[2], Gerdien A Tramper-Stranders[1 2], Rudi W Hendriks[2 3], Gert-Jan Braunstahl[1 2 3]

Affiliations expand

- PMID: 38375427

- PMCID: PMC10875467

- DOI: 10.1183/23120541.00652-2023

Free PMC article

Abstract

Background: Distinguishing asthma and COPD can pose challenges in clinical practice. Increased group 1 innate lymphoid cells (ILC1s) have been found in the lungs and peripheral blood of COPD patients, while asthma is associated with elevated levels of ILC2s. However, it is unclear whether the inflammatory characteristics of ILC1s and ILC2s differ between COPD and asthma. This study aims to compare peripheral blood ILC subsets and their expression of inflammatory markers in COPD patients, asthma patients and controls.

Methods: The study utilised multi-colour flow cytometry to analyse peripheral blood ILC populations in clinically stable COPD patients (n=38), asthma patients (n=37), and smoking (n=19) and non-smoking (n=16) controls.

Results: Proportions of peripheral blood inflammatory $CD4^+$ ILC1s were significantly higher in COPD patients than in asthma. Proportions of $CD4^-$ ILC1s were increased in COPD patients compared to asthma patients and smoking controls. Frequencies of $CD117^-$ ILC2s were significantly reduced in COPD patients compared with asthma patients. In contrast, the fraction of inflammatory $CD45RO^+$ cells within the $CD117^-$ ILC2 population was significantly increased. Principal component analyses showed that combined features of the circulating ILC compartment separated COPD patients from asthma patients and both control groups.

Conclusion: Our in-depth characterisation of ILC1 and ILC2 populations in peripheral blood revealed significant differences in their phenotypes between COPD and asthma patients and smoking or non-smoking controls. These findings suggest a role for both ILC subsets in COPD disease pathology, independent of smoking history, and may have implications for patient stratification and therapy development.

Conflict of interest statement

Conflict of interest: All authors declare that they have no conflicts of interest related to the topic.

- 36 references
- 4 figures

15

BMC Med Educ

. 2024 Feb 19;24(1):153.

doi: 10.1186/s12909-024-05129-3.

Inhaler use technique course: an effective postgraduate training solution for pharmacists to enhance therapeutic outcomes as part of patient education

Weronika Guzenda[1], Jerzy Żabiński[2,3], Beata Plewka[4], Michał Byliniak[5], Piotr Przymuszała[6], Piotr Dąbrowiecki[7], Michał Michalak[8], Magdalena Waszyk-Nowaczyk[4]

Affiliations expand

- PMID: 38374024

- PMCID: PMC10875814

- DOI: 10.1186/s12909-024-05129-3

Free PMC article

Abstract

Background: Patients with asthma and chronic obstructive pulmonary disease could benefit from education on using inhalers provided by pharmacists. However, pharmacists may have limited competencies, indicating the necessity to implement appropriate postgraduate courses. The study aimed to evaluate an inhaler use course for pharmacists, including its impact on participants' knowledge and satisfaction.

Methods: The study involved 261 pharmacists from community pharmacies and was conducted between September 2019 and March 2021. A pre-post analysis of their knowledge of the topic was applied. Additionally, at the beginning of the course, participants were asked about their educational needs, and at the end, they completed a satisfaction survey. The preferred learning formats indicated by participants were interactive workshops and lectures.

Results: As a result of the course, both their actual and self-assessed level of knowledge significantly increased. The percentage of correct answers in the test before the training was 24.4%, while after, it was 84.3% ($p < 0.0001$). Before the course, their average self-assessed level of knowledge was 52.0%, and after the training, it increased to 90.0% ($p < 0.0001$). Almost all respondents stated that the course met their expectations. They estimated their satisfaction at 94.0% and the usefulness of the provided information at 98.0%.

Conclusions: Improved preparation of pharmacists resulting from their participation in the course can contribute to providing more professional advice to patients, thereby positively influencing the pharmaceutical care process in community pharmacies.

Keywords: Asthma; COPD; Inhalers' use training; Pharmaceutical care; Pharmacist.

Conflict of interest statement

The authors declare no competing interests.

- 56 references
- 6 figures

16

Thorax

. 2024 Feb 19:thorax-2023-220230.

doi: 10.1136/thorax-2023-220230. Online ahead of print.

Airway epithelial cell response to RSV is mostly impaired in goblet and multiciliated cells in asthma

Aurore C A Gay[1,2], Martin Banchero[1,2], Orestes Carpaij[2,3], Tessa M Kole[2,3], Leonie Apperloo[1,2], Djoke van Gosliga[2,4], Putri Ayu Fajar[1,2], Gerard H Koppelman[2,4], Louis Bont[5,6], Rudi W Hendriks[7], Maarten van den Berge[2,3], Martijn C Nawijn[8,2]

Affiliations expand

- PMID: 38373824

- DOI: 10.1136/thorax-2023-220230

Abstract

Background: In patients with asthma, respiratory syncytial virus (RSV) infections can cause disease exacerbation by infecting the epithelial layer of the airways, inducing subsequent

immune response. The type I interferon antiviral response of epithelial cells upon RSV infection is found to be reduced in asthma in most-but not all-studies. Moreover, the molecular mechanisms causing the differences in the asthmatic bronchial epithelium in response to viral infection are poorly understood.

Methods: Here, we investigated the transcriptional response to RSV infection of primary bronchial epithelial cells (pBECs) from patients with asthma (n=8) and healthy donors (n=8). The pBECs obtained from bronchial brushes were differentiated in air-liquid interface conditions and infected with RSV. After 3 days, cells were processed for single-cell RNA sequencing.

Results: A strong antiviral response to RSV was observed for all cell types, for all samples ($p<1e-48$). Most (1045) differentially regulated genes following RSV infection were found in cells transitioning to secretory cells. Goblet cells from patients with asthma showed lower expression of genes involved in the interferon response (false discovery rate <0.05), including *OASL*, *ICAM1* and *TNFAIP3*. In multiciliated cells, an impairment of the signalling pathways involved in the response to RSV in asthma was observed.

Conclusion: Our results highlight that the response to RSV infection of the bronchial epithelium in asthma and healthy airways was largely similar. However, in asthma, the response of goblet and multiciliated cells is impaired, highlighting the need for studying airway epithelial cells at high resolution in the context of asthma exacerbation.

Keywords: Airway Epithelium; Asthma; Viral infection.

Conflict of interest statement

Competing interests: GHK, MCN and MvdB received project funding from GlaxoSmithKline. GHK and MvdB received funding from AstraZeneca. MvdB received funding from Novartis, Genentech and Roche.

Editorial

Thorax

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. 2024 Feb 19:thorax-2023-221329.

doi: 10.1136/thorax-2023-221329. Online ahead of print.

Type-2 inflammation: a key treatable trait associated with lung function decline in chronic airways disease

Nayia Petousi[1], Ian D Pavord[2], Brian Daniel Kent[3]

Affiliations expand

- PMID: 38373823

- DOI: 10.1136/thorax-2023-221329

No abstract available

Keywords: Asthma; COPD epidemiology.

Conflict of interest statement

Competing interests: None declared.

SUPPLEMENTARY INFO

Publication typesexpand

FULL TEXT LINKS

18

JAMA

.

. 2024 Feb 19.

doi: 10.1001/jama.2023.26649. Online ahead of print.

Thunderstorm Asthma and Climate Change

Paul J Beggs[1]

Affiliations expand

- PMID: 38372993

- DOI: 10.1001/jama.2023.26649

No abstract available

Plain language summary

This JAMA Insights in the Climate Change and Health Series defines thunderstorm asthma, describes its effects and increased rate of occurrence, and highlights recommendations for improved response during future events.

19

Acta Paediatr

. 2024 Feb 19.

doi: 10.1111/apa.17158. Online ahead of print.

Rhinovirus-induced wheeze was associated with asthma development in predisposed children

Idun Holmdahl[1,2], Sofia Lüning[1,2], Sabina Wärnberg Gerdin[1,2], Anna Asarnoj[1,2], Angela Hoyer[1,2], Anastasia Filiou[1,2], Anders Sjölander[3], Anna James[1,4], Magnus P Borres[3,5], Gunilla Hedlin[1], Marianne van Hage[6,7], Cilla Söderhäll[1,2], Jon R Konradsen[1,2]

Affiliations expand

- PMID: 38372208

- DOI: 10.1111/apa.17158

Abstract

Aim: This study explored whether early-life factors, such as rhinovirus-induced wheeze and allergic sensitisation, were related to asthma at 11 years of age.

Methods: We focused on 107 children aged 6-48 months, who attended the paediatric emergency department at Astrid Lindgren's Children's Hospital in Stockholm, Sweden, with acute wheeze in 2008-2012. They also attended follow-up visits at 11 years of age and were compared with 46 age-matched healthy controls. Odds ratios (OR) with 95% confidence intervals (CI) were calculated with logistic regression.

Results: We found that 62.6% of the acute wheeze cases had asthma at 11 years of age. Rhinoviruses at inclusion were the only common airway viruses associated with an increased asthma risk (OR 2.4, 95% CI 1.02-5.6). Other increased risks were parental heredity for asthma and/or allergies (adjusted OR 3.4, 95% CI 1.1-9.9) and allergic sensitisation at 2 years of age (adjusted OR 3.0, 95% CI 1.02-8.7). The highest prevalence of asthma was when children had both rhinovirus-induced wheeze at inclusion and allergic sensitisation at 7 years of age.

Conclusion: Our findings highlight the importance of hereditary factors and allergic sensitisation on the development of asthma and suggest that rhinoviruses are associated with asthma development in predisposed children.

Keywords: allergic sensitisation; asthma; heredity; preschool wheeze; rhinoviruses.

- 30 references

SUPPLEMENTARY INFO

Grants and fundingexpand

FULL TEXT LINKS

"rhinitis"[MeSH Terms] OR rhinitis[Text Word]

1
Medicine (Baltimore)

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-
-

. 2024 Feb 23;103(8):e37287.

doi: 10.1097/MD.0000000000037287.

Risk prediction model construction for asthma after allergic rhinitis by blood immune T effector cells

Jian Wang[1], Tao Jiang, Jian-Dao Hu

Affiliations expand

- PMID: 38394538

- DOI: 10.1097/MD.0000000000037287

Abstract

Background: Allergic rhinitis (AR) and asthma (AS) are prevalent and frequently co-occurring respiratory diseases, with mutual influence on each other. They share similar etiology, pathogenesis, and pathological changes. Due to the anatomical continuity between the upper and lower respiratory tracts, allergic inflammation in the nasal cavity can readily propagate downwards, leading to bronchial inflammation and asthma. AR serves as a significant risk factor for AS by potentially inducing airway hyperresponsiveness in patients. Currently, there is a lack of reliable predictors for the progression from AR to AS.

Methods: In this exhaustive investigation, we reexamined peripheral blood single cell RNA sequencing datasets from patients with AS following AR and healthy individuals. In addition, we used the bulk RNA sequencing dataset as a validation lineup, which included AS, AR, and healthy controls. Using marker genes of related cell subtype, signatures predicting the progression of AR to AS were generated.

Results: We identified a subtype of immune-activating effector T cells that can distinguish patients with AS after AR. By combining specific marker genes of effector T cell subtype, we established prediction models of 16 markers. The model holds great promise for assessing AS risk in individuals with AR, providing innovative avenues for clinical diagnosis and treatment strategies.

Conclusion: Subcluster T effector cells may play a key role in post-AR AS. Notably, ACTR3 and HSPA8 genes were significantly upregulated in the blood of AS patients compared to healthy patients.

Conflict of interest statement

The authors have no conflicts of interest to disclose.

- 47 references

FULL TEXT LINKS

UNIMORE

Proceed to details

Cite

2

J Alzheimers Dis

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. 2024 Feb 22.

doi: 10.3233/JAD-231091. Online ahead of print.

Causal Association Between Allergic Diseases and Dementia: Evidence from Multivariate Mendelian Randomization Study

YuanYing Wang [1], ShiHao Wang [2], JiaXin Wu [1], XinLian Liu [3], LuShun Zhang [3]

Affiliations expand

- PMID: 38393908

- DOI: 10.3233/JAD-231091

Abstract

Background: The link between allergic diseases and dementia remains controversial, and the genetic causality of this link is unclear.

Objective: This study investigated the causal relationship between allergic diseases and dementia using univariate and multivariate Mendelian randomization (MR) methods.

Methods: We selected genome-wide association studies including 66,645 patients with allergic diseases and 12,281 patients with dementia, with statistical datasets derived from the FinnGen Consortium of European origin. After a rigorous screening process for single nucleotide polymorphisms to eliminate confounding effects, MR estimation was performed mainly using the inverse variance weighting method and the MR-Egger method. Sensitivity analyses were performed using Cochran's Q test, MR-PRESSO test, MR Pleiotropy residuals and leave-one-out analysis.

Results: Univariate and multivariate MR together demonstrated a causal relationship between atopic dermatitis and reduced vascular dementia (VaD) risk (OR = 0.89, 95% CI: 0.81-0.99, p = 0.031; OR = 0.85, 95% CI: 0.76-0.95, p = 0.003). MVMR confirmed asthma was associated with a reduction in the risk of Alzheimer's disease (AD) (OR = 0.82, 95% CI: 0.71-0.94, p = 0.005) and may be associated with a reduction in the risk of VaD (OR = 0.80, 95% CI: 0.65-0.99, p = 0.042); allergic rhinitis may be causally associated with an increased risk of AD (OR = 1.16, 95% CI: 1.00-1.35, p = 0.046) and VaD (OR = 1.29, 95% CI: 1.03-1.62, p = 0.027). In sensitivity analyses, these findings were reliable.

Conclusions: MR methods have only demonstrated that allergic rhinitis dementia is associated with an increased risk of developing dementia. Previously observed associations between other allergic diseases and dementia may be influenced by comorbidities and confounding factors rather than causality.

Keywords: Alzheimer's disease; Mendelian randomization; allergic rhinitis; asthma; atopic dermatitis; dementia.

3

Curr Opin Allergy Clin Immunol

. 2024 Feb 22.

doi: 10.1097/ACI.0000000000000975. Online ahead of print.

Global burden of pediatric asthma and rhinitis – what we have recently learned from epidemiology

Sergio de Jesús Romero-Tapia[1], Luis García-Marcos[2]

Affiliations expand

- PMID: 38386768

- DOI: 10.1097/ACI.0000000000000975

Abstract

Purpose of review: To analyze and present recently published information on the factors that modify the burden of asthma and rhinitis in pediatric ages, such as ecological determinants; highlighting access and adherence to medications, exposure to pollutants and climate change. In addition to individual determinants such as obesity, protective & risk factors and comorbidities.

Recent findings: Asthma and rhinitis continue to have a significant impact worldwide on the health of affected patients, primarily children. The burden of asthma is greatest in developing countries and vulnerable populations, resulting in increased morbidity, potentially preventable asthma deaths and socioeconomic consequences.

Summary: A better understanding and representation of the burden of asthma and rhinitis in children can contribute to prevention strategies and improvements in the care of pediatric patients.

- 30 references

. 2024 Feb 22;34(1):12-19.

doi: 10.18176/jiaci.0923. Epub 2023 Jul 26.

From MASK-air and SILAM to CATALYSE (Climate Action To Advance HeaLthY Societies in Europe)

B Sousa-Pinto[1,2], Y Palamarchuk[3], L Leemann[4], S Jankin[5], X Basagaña[6,7,8,9], J Ballester[6], A Bedbrook[10], W Czarlewski[10,11], R Almeida[1,2,11], T Haahtela[12], H Haveri[13], M Prass[14,15], T Henriques[1,2], R J Vieira[1,2], L Klimek[16,17], M Ollert[18,19,20], M H Shamji[21,22], M Jutel[23,24], S Del Giacco[25], M J Torres[26], T Zuberbier[27,28], J A Fonseca[1,2], M Sofiev[3], J M Anto[6,8,9], J Bousquet[10,27,28,29]

Affiliations expand

- PMID: 37498647

- DOI: 10.18176/jiaci.0923

Free article

Abstract

Plant species vary under different climatic conditions and the distribution of pollen in the air. Trends in pollen distribution can be used to assess the impact of climate change on public health. In 2015, the Mobile Airways Sentinel networK for rhinitis and asthma (MASK-air®) was launched as a project of the European Innovation Partnership on Active and Healthy Ageing (EIP-on-AHA, DG Santé and DG CONNECT). This project aimed to develop a warning system to inform patients about the onset of the pollen season, namely, the System for Integrated modeLling of Atmospheric coMposition (SILAM). A global-to-meso-scale dispersion model was developed by the Finnish Meteorological Institute (FMI). It provides quantitative information on atmospheric pollution of anthropogenic and natural origins, particularly on allergenic pollens. Impact of Air Pollution on Asthma and Rhinitis (POLLAR, EIT Health) has combined MASK-air clinical data with SILAM forecasts. A new Horizon Europe grant (Climate Action to Advance HeaLthY Societies in Europe [CATALYSE]; grant agreement number 101057131), which came into force in September 2022, aims to improve our understanding of climate change and help us find ways to counteractit. One objective of this project is to develop early warning systems and predictive models to improve the effectiveness of strategies for adapting to climate change. One of the warning

systems is focused on allergic rhinitis (CATALYSE Task 3.2), with a collaboration between the FMI (Finland), Porto University (Portugal), MASK-air SAS (France), ISGlobal (Spain), Hertie School (Germany), and the University of Zurich (Switzerland). It is to be implemented with the support of the European Academy of Allergy and Clinical Immunology. This paper reports the planning of CATALYSE Task 3.2.

Keywords: CATALYSE; Climate change; MASK-air; Pollen; SILAM.

5

Sci Total Environ

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. 2024 Feb 20:912:169215.

doi: 10.1016/j.scitotenv.2023.169215. Epub 2023 Dec 11.

Effects of airborne pollen on allergic rhinitis and asthma across different age groups in Beijing, China

Sun Zhaobin[1], Zhao Yuxin[2], An Xingqin[2], Gao Na[3], Li Ziming[4], Zhang Shuwen[5], Liang Yinglin[2], Ruan Wenxi[2], Bu Yaqin[2], Xin Jingyi[2], Li Shihong[6]

Affiliations expand

- PMID: 38086478

- DOI: 10.1016/j.scitotenv.2023.169215

Abstract

In the context of global warming and rapid urbanization, pollen has become a significant public health concern for Chinese citizens. However, there is a paucity of epidemiological research on the impact of pollen on allergen-linked diseases, such as allergic rhinitis and asthma, in China. Using data from the Beijing Chaoyang Hospital between 2013 and 2019, which included allergic rhinitis and asthma incidence, meteorological records, and air pollution data, we employed a Generalized Additive Model (GAM) to examine the relationship between overall and type-specific pollen concentrations in relation to varying population exposures. We found that increased overall pollen concentrations significantly increased the risks of allergic rhinitis and asthma in diverse populations. Notably, the risk of allergic rhinitis was higher than that of asthma at equivalent pollen concentrations. Seasonal trends indicated that spring pollen peaks, primarily from trees, were associated with a lower risk of both allergic rhinitis and asthma than autumn peaks, predominantly from weeds. This study underscores the importance of identifying pollen species that pose heightened risks to different demographic groups across seasons, thereby providing targeted interventions for public health agencies.

Keywords: Exposure-response relationship; Generalized additive model; Pollen concentrations; Population exposure.

Conflict of interest statement

Declaration of competing interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

6

Environ Res

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. 2024 Feb 19:118523.

doi: 10.1016/j.envres.2024.118523. Online ahead of print.

A machine-learning exploration of the exposome from preconception in early childhood atopic eczema, rhinitis and wheeze development

Yizhi Dong[1], Hui Xing Lau[2], Noor Hidayatul Aini Suaini[3], Michelle Zhi Ling Kee[4], Delicia Shu Qin Ooi[5], Lynette Pei-Chi Shek[6], Bee Wah Lee[7], Keith M Godfrey[8], Elizabeth Huiwen Tham[9], Marcus Eng Hock Ong[10], Nan Liu[11], Limsoon Wong[12], Kok Hian Tan[13], Jerry Kok Yen Chan[14], Fabian Kok Peng Yap[15], Yap Seng Chong[16], Johan Gunnar Eriksson[17], Mengling Feng[18], Evelyn Xiu Ling Loo[19]

Affiliations expand

- PMID: 38382664

- DOI: 10.1016/j.envres.2024.118523

Abstract

Background: Most previous research on the environmental epidemiology of childhood atopic eczema, rhinitis and wheeze is limited in the scope of risk factors studied. Our study adopted a machine learning approach to explore the role of the exposome starting already in the preconception phase.

Methods: We performed a combined analysis of two multi-ethnic Asian birth cohorts, the Growing Up in Singapore Towards healthy Outcomes (GUSTO) and the Singapore PREconception Study of long Term maternal and child Outcomes (S-PRESTO) cohorts. Interviewer-administered questionnaires were used to collect information on demography, lifestyle and childhood atopic eczema, rhinitis and wheeze development. Data training was performed using XGBoost, genetic algorithm and logistic regression models, and the top 15 variables with the highest importance based on Shapley values were identified. Additive explanation values were identified and inputted into a final multiple logistic regression

model. Generalised structural equation modelling with maternal and child blood micronutrients, metabolites and cytokines was performed to explain possible mechanisms.

Results: The final study population included 1151 mother-child pairs. Our findings suggest that these childhood diseases are likely programmed in utero by the preconception and pregnancy exposomes through inflammatory pathways. We identified preconception alcohol consumption and maternal depressive symptoms during pregnancy as key modifiable maternal environmental exposures that increased eczema and rhinitis risk. Our mechanistic model suggested that higher maternal blood neopterin and child blood dimethylglycine protected against early childhood wheeze. After birth, early infection was a key driver of atopic eczema and rhinitis development.

Conclusion: Preconception and antenatal exposomes can programme atopic eczema, rhinitis and wheeze development in utero. Reducing maternal alcohol consumption during preconception and supporting maternal mental health during pregnancy may prevent atopic eczema and rhinitis by promoting an optimal antenatal environment. Our findings suggest a need to include preconception environmental exposures in future research to counter the earliest precursors of disease development in children.

Keywords: Atopic eczema; Exposome; Machine learning; Rhinitis; Wheeze.

Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Yap Seng Chong reports a relationship with Abbott Nutrition that includes: funding grants and speaking and lecture fees. Keith M Godfrey reports a relationship with Abbott Nutrition that includes: funding grants and speaking and lecture fees. Yap Seng Chong reports a relationship with Nestle that includes: funding grants and speaking and lecture fees. Keith M Godfrey reports a relationship with Nestle that includes: funding grants and speaking and lecture fees. Yap Seng Chong reports a relationship with Danone that includes: funding grants and speaking and lecture fees. Keith M Godfrey reports a relationship with Danone that includes: funding grants and speaking and lecture fees. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

7

Rhinology

. 2024 Feb 19.

doi: 10.4193/Rhin23.287. Online ahead of print.

Nasal hyperreactivity in allergic rhinitis and chronic rhinosinusitis with polyps: a role for neuronal pathways

W Backaert[1,2], B Steelant[1], T Wils[1], Z Qian[1], E Dilissen[1], A-C Jonckheere[1], B Boonen[3,4], M Jorissen[2,5], R Schrijvers[1,6,7], M A Bullens[1,8], K Talavera[3,4], P W Hellings[1,2,9,10], L Van Gerven[1,2,5]

Affiliations expand

- PMID: 38372647

- DOI: 10.4193/Rhin23.287

Abstract

Background: Nasal hyperreactivity (NHR) is prevalent in all chronic upper airway inflammatory phenotypes, including allergic rhinitis (AR) and chronic rhinosinusitis with nasal polyps (CRSwNP). Although NHR in patients with non-allergic rhinitis is mediated by neuronal pathways, AR and CRSwNP are mainly characterized by type 2 inflammation.

Methods: Eighteen healthy controls and 45 patients with symptomatic AR/CRSwNP underwent a cold, dry air (CDA) provocation test for objective diagnosis of NHR. Before and after, questionnaires were filled out and nasal secretions and biopsies were collected. Markers for neurogenic inflammation (substance P, calcitonin gene-related peptide, neurokinin A), epithelial activation (IL-33), and histamine were measured in secretions by

ELISA; and expression of neuronal markers PGP9.5, TRPV1, and TRPM8 was studied in biopsies by RT-q-PCR. Effects of histamine on TRPV1/A1 were studied with Ca2+-imaging using murine trigeminal neurons.

Results: CDA-provocation reduced peak nasal inspiratory flow (PNIF) of patients with subjective NHR but not of non-NHR controls/ patients (p.

8

Int Forum Allergy Rhinol

. 2024 Feb 19.

doi: 10.1002/alr.23339. Online ahead of print.

Severe epistaxis after posterior nasal nerve ablation requiring surgical intervention: A multi-center case series

Najm S Khan[1], Yuki Yoshiyasu[2], Brian S Wang[1], Antoine Khoudari[3], Dean M Clerico[3], Jackson M King[4], Toby O Steele[4], Aatin K Dhanda[1], Masayoshi Takashima[1], Omar G Ahmed[1]

Affiliations expand

- PMID: 38372028

- DOI: 10.1002/alr.23339

Abstract

Severe epistaxis occurs in 2% of PNN ablation cases, independent of method or device type. Major epistaxis requiring intervention after PNN ablation can occur on average 20 days post-procedure.

Keywords: adverse events; chronic rhinitis; complications; cryosurgery; radiofrequency; rhinorrhea.

- 6 references

SUPPLEMENTARY INFO

Publication typesexpand

FULL TEXT LINKS

chronic cough

"bronchiectasis"[MeSH Terms] OR bronchiectasis[Text Word]

1
BMJ Open Respir Res

-
-
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. 2024 Feb 22;11(1):e002077.

doi: 10.1136/bmjresp-2023-002077.

Association between statin use and tuberculosis risk in patients with bronchiectasis: a retrospective

population-based cohort study in Taiwan

Kuang-Ming Liao[#1,2], Chung-Shu Lee[#3,4], Yu-Cih Wu[5], Chin-Chung Shu[#6,7], Chung-Han Ho[#8,9,10]

Affiliations expand

- PMID: 38387995

- DOI: 10.1136/bmjresp-2023-002077

Free article

Abstract

Background: Chronic airway diseases have been associated with an increased risk of tuberculosis (TB); however, data in patients with bronchiectasis is limited. Statins have been shown to exhibit anti-inflammatory effects by modulating the inflammatory response. This study investigated whether statin treatment could reduce the risk of TB in patients with bronchiectasis.

Methods: We conducted a retrospective cohort study using a nationwide population database of patients with bronchiectasis who did or did not receive statin treatment. The defined daily dose (DDD) of statin, current or past statin user and statin exposure time were measured for the impact of statin use. The primary outcome was the incidence of new-onset TB. Considering of potential immortal time bias due to stain exposure time, Cox regression models with time-dependent covariates were employed to estimate HRs with 95% CIs for TB incidence among patients with bronchiectasis.

Results: Patients with bronchiectasis receiving statin treatment had a decreased risk of TB. After adjusting for age, sex, income, comorbidities and Charlson Comorbidity Index, statin users had a 0.59-fold lower risk of TB incidence compared with non-statin users (95% CI 0.40 to 0.88; p=0.0087). Additionally, compared with non-statin users, statin treatment was a protective factor against TB in users with a cumulative DDD greater than 180 per year, with an HR of 0.32 (95% CI 0.12 to 0.87; p=0.0255).

Conclusions: Statin treatment demonstrated a dose-dependent protective effect and was associated with a reduced risk of TB in patients with bronchiectasis. These findings suggest that statins may play a role in lowering TB risk by modulating airway inflammation in this patient population.

Keywords: Bronchiectasis; Tuberculosis.

Conflict of interest statement

Competing interests: None declared.

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Case Reports

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Persistent cough and situs inversus in a middle-aged female

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Abstract

Kartagener syndrome, a rare genetic disorder, can present in adults with persistent respiratory symptoms and radiological changes, such as bronchiectasis and situs inversus. Clinicians should maintain a high clinical suspicion, as early recognition and appropriate management are crucial for preserving pulmonary function.

Keywords: Kartagener syndrome; bronchiectasis; persistent cough; situs inversus.

Conflict of interest statement

None declared.

- 2 references
- 1 figure

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Mucus clears from the trachea in a helix: a new twist to understanding airway diseases

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Abstract

Background: Mucociliary clearance (MCC) is critical to lung health and is impaired in many diseases. The path of MCC may have an important impact on clearance but has never been rigorously studied. The objective of this study is to assess the three-dimensional path of human tracheal MCC in disease and health.

Methods: Tracheal MCC was imaged in 12 ex-smokers, 3 non-smokers (1 opportunistically imaged during acute influenza and repeated after recovery) and 5 individuals with primary ciliary dyskinesia (PCD). Radiolabelled macroaggregated albumin droplets were injected into the trachea via the cricothyroid membrane. Droplet movement was tracked via scintigraphy, the path of movement mapped and helical and axial models of tracheal MCC were compared.

Measurements and main results: In 5/5 participants with PCD and 1 healthy participant with acute influenza, radiolabelled albumin coated the trachea and did not move. In all others (15/15), mucus coalesced into globules. Globule movement was negligible in 3 ex-smokers, but in all others (12/15) ascended the trachea in a helical path. Median cephalad tracheal MCC was 2.7 mm/min ex-smokers vs 8.4 mm/min non-smokers (p=0.02) and correlated strongly to helical angle (r=0.92 (p=0.00002); median 18◦ ex-smokers, 47◦ non-smokers (p=0.036)), but not to actual speed on helical path (r=0.26 (p=0.46); median 13.6 mm/min ex-smokers vs 13.9 mm/min non-smokers (p=1.0)).

Conclusion: For the first time, we show that human tracheal MCC is helical, and impairment in ex-smokers is often caused by flattened helical transit, not slower

movement. Our methodology provides a simple method to map tracheal MCC and speed in vivo.

Keywords: Airway Epithelium; Bronchiectasis; COPD Pathology; Imaging/CT MRI etc; Lung Physiology; Primary ciliary dyskinesia.

Conflict of interest statement

Competing interests: None declared.