JOURNAL CLUB

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Tailoring asthma treatment on eosinophilic markers (exhaled nitric oxide or sputum eosinophils): a systematic review and meta-analysis

Helen L Petsky, Chris J Cates, Kayleigh M Kew and Anne B Chang
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Personalising the treatment of people with asthma is based on objective airway inflammation, which will be predominantly eosinophilic or non-eosinophilic (including neutrophilic). For both, inhaled corticosteroids (ICS) are the major preventer therapy to control asthma symptoms (other than for children with mild intermittent asthma), with greater effectiveness seen in patients with eosinophilic inflammation.

Petsky and colleagues in Australia and the UK have previously published a systematic review on the analysis of objective airway inflammation. Here they update that review by providing an overview of three recent related Cochrane reviews, with the objective of evaluating the efficacy of tailoring asthma medications based on fractional exhaled nitric oxide (FeNO) or sputum eosinophils in comparison with controls (clinical symptoms with or without spirometry/peak flow).

The 16 studies included seven (adult) of FeNO-based management and six (adult) of sputum-based management. Eosinophil-based asthma therapy is effective in decreasing asthma exacerbations in adults, with no significant impact on asthma control or lung function. In children, treatment based on FeNO levels decreases asthma exacerbations, at the expense of increased ICS doses. There is insufficient evidence to advocate their use in routine clinical practice. In future, meta-analyses based on individual patient data of all studies may further inform the efficacy of strategies based on airway eosinophilic markers.

At-risk children with asthma (ARC): a systematic review

Audrey Buelo, Susannah McLean, Steven Julious, et al.
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According to the 2014 National Review of Asthma Deaths, 25,000 children are admitted annually with an asthma attack, affecting quality of life for those affected.

Many factors are linked with an increased risk of attack, but their relative contribution to increased risk is not clear. This systematic review aimed to identify factors associated with the risk of attack in children aged 5-12 years with asthma, and to weight their importance and the strength of the underpinning evidence to inform risk stratification.

Following Cochrane methodology and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), the authors considered 68 papers from 16,109 records. Children with a history of previous attacks and persistent asthma symptoms were at greatly increased risk, particularly if they had poor access to care. Those with a sub-optimal drug regimen, combined atopic/allergic disease, an African-American ethnicity, with vitamin D deficiency and affected by poverty were at moderately increased risk. Younger age, being overweight, exposure to environmental tobacco smoke and low parental education were associated with slightly increased risk. No increased risk was associated with gender, urban residence and Hispanic ethnicity.

Point of care microspirometry to facilitate the COPD diagnostic process in primary care: a clustered randomised trial

Tjard R Schromer, Maria Vatslakoi, Robbert Behr, et al.
npj Primary Care Respiratory Medicine 2018;28:17
doi: 10.1038/s41533-018-0083-9

Diagnostic spirometric confirmation of chronic obstructive pulmonary disease (COPD) takes more time to perform and interpret than that afforded by a GP consultation. GPs cite the lack of objective information during a consultation as an important barrier in the diagnostic process, resulting in COPD being widely underdiagnosed in primary care.

Microspirometry, which measures forced expiratory volume in one second, could help GPs recognise airway obstruction more easily and immediately during a regular consultation of an at-risk patient, who could then be scheduled for subsequent diagnostic spirometry testing. The result would be earlier diagnosis of COPD and more efficient use of full diagnostic spirometry testing.

This study explored the effect of introducing microspirometry in general practice as a point-of-care test for COPD. They conducted a 6–8-month cluster randomised controlled trial in 21 practices with 416 possibly undiagnosed COPD patients.

In subjects who were identified as being at risk from COPD, the diagnostic process was completed and reported more often when the GP had a microspirometer available. In addition, use of diagnostic spirometry appeared to be more efficient in the microspirometry group. Although microspirometry improved the diagnostic process, the majority of possible undiagnosed COPD patients remained unrecognised by their GPs.

Socioeconomic inequality in the use of prescription medications for smoking cessation among patients with COPD: a nationwide study

Sandra Sogaard Tøttenborg, Alice Jessie Clark, Reimar Wernich Thomsen, et al.
Intl J COPD 2018;13:1775–1781
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Smoking cessation is an effective intervention in aiding the slowing of COPD. The combination of pharmacotherapy (e.g. bupropion or varenicline) and behavioural intervention is the most effective smoking cessation method. However, in Denmark bupropion and varenicline are often unsubsidised and costly, potentially affecting the likelihood of a successful quit in particular subgroups of society.

This study explored the use of these quitting aids in COPD patients, and the socioeconomic patterns of use among these individuals. Using the Danish register of COPD and National Prescription Registry, the researchers identified and followed 4,741 smoking COPD patients for six months from first outpatient clinic contact. They documented the likelihood of these individuals filling out a prescription for either varenicline or bupropion, and calculated the odds for filling out a prescription based on socio-demographic patient characteristics.

Results revealed these pharmacotherapies were sparingly used among COPD outpatients, with the lowest use being observed among those most socioeconomically disadvantaged. Based on this, researchers concluded that this highlights a missed opportunity for intervention.
Care in Chronic Obstructive Lung Disease (CAROL): a randomised trial in general in general practice

Stefan Markun, Thomas Rosemann, Kaba Dalla-Lana, et al.
Eur Respir J 2018;51:1701873

COPD requires continual management that is often complex. Disease-management aids, known as care bundles, may help address this complexity and improve the efficiency and efficacy of COPD management. Markun and colleagues attempt to test the role of COPD care bundles in the implementation of COPD care by GPs and practice assistants.

This cluster-randomised clinical trial followed 35 GPs and 216 COPD patients for one year, half of which were given the care bundle (intervention), while the rest were given usual care (control). Results demonstrated that COPD care bundles resulted in significantly higher implementation rates of seven of the nine studied key elements of COPD care compared with the control. Based on these results, the researchers concluded that the implementation of key elements of COPD care increased in general practice as a result of the COPD care bundle.

Physical Inactivity, Functional Status and Exercise Capacity in COPD Patients Receiving Home-Based Oxygen Therapy

Camila Mazzarin, Demetria Kovelis, Samia Blazim, et al.
COPD 2018;0:1-6
doi: 10.1080/15412555.2018.1469608

Physical activity is a key influencing factor in individuals with COPD, contributing to quality of life, number of exacerbations and mortality. Understanding the factors that contribute to reduced physical activity in daily life (PADL) in these individuals can lead to the implementation of interventions to help reduce its impact on patients.

In this study, Mazzarin and colleagues explored the connection between severe PADL and pulmonary function, fatigue, dyspnea, functional status and exercise capacity in individuals with COPD on home-based long-term oxygen therapy (LTOT). They also aimed to understand which of these variables could influence inactivity in COPD patients.

Pulmonary function, fatigue, dyspnea, functional status, exercise capacity and PADL (steps/day) were assessed in 39 COPD patients on LTOT using electric oxygen concentrators.

Based on their number of steps/day, all participants were classified as severely inactive (mean = 973), with reports of fatigue, dyspnea, reduced functional status and limited exercise capacity. No correlation was observed between the number of steps/day and severity of airway obstruction, but there was a significant correlation between steps/day and daily duration of LTOT, fatigue, functional status and capacity to exercise. Researchers concluded that longer daily duration of LTOT, fatigue, worse functional status and exercise capacity were related to reduced PADL in individuals with COPD on LTOT.

Effectiveness of a standardized electronic admission order set for acute exacerbation of chronic obstructive pulmonary disease

doi:10.1186/s12890-018-0657-x

Despite the existence of evidence-based management guidelines for acute exacerbations of COPD, significant variability exists in the care provided to patients admitted to hospital for this reason.

This study explored the effectiveness of a standardised admission order set for patients with COPD exacerbations admitted to a hospital over a two-year period. The order set contained recommendations for tests, medication (including dosage and delivery method), consultations and discharge planning. To encourage their increased use, some interventions, such as physiotherapy referrals, were automatically pre-selected in the order set.

Median length of stay did not differ before and after the order set was implemented: 6.37 days in the pre-implementation period, and 6.02 days post-implementation. However, after the order set was implemented, length of stay was significantly shorter by 1.15 days for patients in whom the order set was used. Order set implementation and use was not associated with change in readmission, suggesting earlier discharge did not occur at the expense of patient harm, and that order sets may reduce the burden of acute exacerbations.

Chronic cough as a novel phenotype of chronic obstructive pulmonary disease

doi:10.2147/COPD.S153821

The chronic bronchitis phenotype of COPD is characterised by persistent cough and sputum production, and is associated with worse respiratory symptoms, high rates of acute exacerbation and greater disease impact than other phenotypes. However, chronic cough can occur without sputum, and the clinical characteristics of this are not well studied.

Of the enrolled 1,613 COPD patients, over a quarter of whom were current smokers, 23.4% reported chronic cough and 32.4% chronic sputum, while 18.2% had both symptoms. Those with chronic cough were more likely to be younger patients and current smokers; they also exhibited more frequent exacerbations and severe dyspnoea, and poorer quality of life than those without chronic cough. Compared with patients having sputum only, those with cough had only more severe airflow limitation. Chronic cough was an independent risk factor in lower FEV1 and diffusing capacity of the lungs for carbon monoxide, but sputum production was not found to be associated with these measurements.

Although the study had several limitations, its findings suggest chronic cough could be more significantly associated with disease severity and poor outcomes than sputum production, warranting further studies.
These are synopses of articles as they appeared at the time of writing. Articles are always subject to change post-publication; please ensure you check the latest version of the article before referencing any of this information.

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