Background Occupational exposures are important and preventable causes of COPD. In a cross-sectional study of current occupation among over 220,000 workers in the UK Biobank cohort (over 500,000 subjects) we previously reported that 14 jobs were associated with increased COPD risk (De Matteis S, et al., OEM, 2016). To progress these findings we developed OSCAR, a new web-based tool for efficient self-reporting and automatic coding of job-histories in large population-based studies. Our aim was to identify the occupations at increased COPD risk taking into account lifetime job-histories in the UK general population.

Methods We administered OSCAR to all UK Biobank participants with an available email address ($n = 324,653$) between June-February 2016. Paid jobs held for at least six months were collected and coded by OSCAR using the UK Standard Occupational Classification (SOC), v.2000. COPD was defined as $FEV_1/FVC < LLN$ based on spirometry performed at recruitment. Prevalence ratios (PRs) for ever-exposure to each of the 353 SOC-coded jobs using lifetime office workers as reference category were estimated using Poisson regression with adjustment for age, sex, recruitment centre and lifetime tobacco smoking. In addition, we used lifetime cumulative job durations to test for exposure-response trends.

Results Among the 116,375 participants who completed OSCAR (response rate: 34%), 94,551 had acceptable and repeatable spirometry data (according to ERS/ATS criteria) and smoking information and were included in the analyses. Taking into account individual lifetime job-histories, 19 jobs significantly increased COPD risk (e.g. 'fishing and agriculture related occupations': PR: 1.69; 95% confidence interval (CI): 1.18–2.42, and 'food, drink and tobacco process operatives': PR: 1.42; 95% CI: 1.02–1.97). The majority were also confirmed by positive exposure-response trends for cumulative years of employment in each job/lifetime.

Conclusions Compared to our previous cross-sectional study, some jobs were confirmed (e.g. 'food, drink and tobacco process operatives', and 'horticultural trades') while others were not (e.g. 'coal miners'), likely due to the few employed in these jobs among the OSCAR responders. OSCAR is still collecting job-histories in the UK Biobank cohort; further analyses on a larger sample, as well analyses restricted to never-smokers and never-asthmatics to investigate the possibility of residual confounding, are planned.

Virtual Smoking: The Risks of the Evil Weeds

S122 EFFECTS OF VAPED E-CIGARETTE LIQUID CONDENSATE UPON HUMAN ALVEOLAR MACROPHAGE FUNCTION. TO VAPE OR NOT TO VAPE THAT IS THE QUESTION?

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Introduction and objectives Electronic cigarette usage or "vaping" has risen exponentially in recent years in smokers and ex-smokers. Published data suggests that vaping e-cigarette liquid (ECL) may not be as benign as propounded by e-cigarette companies which are increasingly owned by "big tobacco". Much of the current literature has focused on the effect of non-vaporised ECL – such studies do not fully reflect the exposure of the user, as the process of vaping causes chemical changes in ECL. To investigate

the effect of unvaped ECL and vaped e-cig condensate (ECVC) using our novel system, with and without nicotine, on alveolar macrophage (AM) viability and immune responses.

Methods We developed a novel method to produce ECVC to allow direct comparison with unvaped ECL. Nicotine concentration as assessed by GFID was 31 mg/ml in ECL and 26 mg/ml in ECVC. AMs were obtained from lung resection tissue and treated with ECVC/ECL $\pm$ nicotine. Cell viability was assessed by cell titre aqueous assay, apoptosis, necrosis and markers of macrophage phenotype (CD68, CD80, CD163, CD206) were assessed by flow cytometry. IL-8 release by AMs was assessed by ELISA.

Results AM culture with ECL or ECVC resulted in dose dependent reduction in cell viability. ECVC was cytotoxic at lower concentrations than ECL (0.8% ECVC vs 5 %ECL, $n = 6$). 24 hour culture with 1% ECVC resulted in a 5fold increase in AM apoptosis and 2 fold increase in necrosis compared with 1%ECL ($p = 0.079$, $n = 5$). Nicotine containing ECVC caused more apoptosis vs nicotine free ECVC (27.2% vs 13.4%, ($p = 0.0079$, $n = 4$). Culture with 0.6%ECVC significantly increased supernatant levels of IL-8 compared with 1% ECL ($p = 0.015$, $n = 4$). ECVC was also found to affect macrophage phenotype, showing both nicotine dependent/independent regulations of markers of macrophage m1/m2 polarisation (CD80 $p = 0.0357$, CD163 $p = 0.0179$, CD206 $p = 0.0357$, $n = 6$).

Conclusions Our novel system creates ECVC which is sterile, minimises loss of nicotine and prevents dilution of the vapour. Vaped E-cigarette condensate is significantly more toxic to AMs than non-vaped e cigarette liquid. Furthermore, ECVC with nicotine is significantly more toxic than ECVC without Nicotine. Effects shown on inflammatory cytokine production and markers of macrophage polarisation indicate both nicotine dependent and independent effects of ECVC on alveolar macrophages.

S123 THE EFFECTS OF ELECTRONIC CIGARETTE FLAVOURINGS ON MACROPHAGE CYTOKINE RELEASE AND PHAGOCYTOSIS

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Background Electronic cigarettes (e-cigarettes) are marketed as an alternative to tobacco cigarettes, but little is known regarding their biological effects. Studies to date have produced varying results, reflecting varying chemical compositions of different e-liquids.

Chronic tobacco smoking is known to alter macrophage function, resulting in impaired bacterial phagocytosis and increased release of cytokines including $TNF\alpha$, CXCL8 and IL-6. To date, there is little understanding of the effects of e-cigarettes on human macrophages. It was hypothesised that e-cigarettes would produce effects on macrophage function comparable to those of tobacco cigarettes.

Methods Six e-liquids were investigated: tobacco-flavoured e-liquid ($\pm$ nicotine), banoffee-pie-flavoured e-liquid ($\pm$ nicotine), e-liquid vehicle (propylene glycol + vegetable glycerine) and nicotine-vehicle solution. Effects of e-cigarette vapour extracts (e-CVEs) were compared with cigarette smoke extract (CSE) from a tobacco cigarette. Monocyte-derived macrophages (MDMs) from healthy subjects ($n = 6$) were cultured for 24 h with e-CVEs or CSE then incubated for 4h with *Streptococcus pneumoniae* or *Haemophilus influenzae*. Cell viability was determined and