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P40 INCREASED ADVANCED GLYCATION END PRODUCTS IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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Introduction Advanced glycation endproducts (AGE) are markers of glycaemic and oxidative stress, pro-inflammatory and alter structure through collagen cross-linking, formed through the Maillard reaction. There has been recent interest in AGE and its receptor: RAGE in airways[1] and circulating[2] in subjects with COPD as well as in a GWAS of lung function.[3] Skin autofluoresence permits non-invasive measurement of skin AGE, validated against biopsies. Skin levels reflect accumulation, unlike circulating levels which are more variable. We hypothesised that skin AGE was increased in subjects with COPD and related to lung function. Methods Subjects >40 years, with and without COPD, all with >10 smoking pack years, were recruited. All subjects were assessed at clinical stability. Control never smokers were also recruited. Detailed history, post-bronchodilator spirometry and skin AGE were determined. Circulating AGE and soluble RAGE were measured by ELISA.

Results There were 49 COPD subjects; 18 current/ex-smokers without COPD; 16 never smokers, Abstract P40 table 1. The mean skin AGE was greatest in subjects with COPD compared to both control groups, $p<0.05$, ANOVA, Abstract P40 table 1. There was an indirect relationship between FEV_1 % predicted and skin AGE, $r=-0.46$, $p<0.01$. A stepwise multiple regression was performed, with skin AGE as the dependent, and FEV_1 % predicted, smoking pack years, age, BMI and gender entered into the model. FEV_1 % predicted and smoking pack years were independent variables, $p<0.01$. There was no significant difference in serum AGE between groups. Mean soluble RAGE was lowest in the COPD subjects and significantly lower than control never smokers, $p<0.05$, ANOVA, Abstract P40 table 1.

Abstract P40 Table 1

Mean (SD)	Control never smoker (n=16)	Control current/ex smoker (n=18)	COPD (n=49)
Age (years)	56 (7)	55 (10)	67 (10)* †
Men, n (%)	8 (50%)	5 (28%)	28 (57%)
BMI (kg/m^2)	24.5 (3.4)	27.0 (4.6)	27.9 (5.5)
Smoking pack years	0	27 (18)	52 (30)* †
Oxygen saturations (%)	97 (1)	96 (1)	95 (2)
FEV_1 (L)	3.11 (0.75)	2.64 (0.70)	1.52 (0.60)* †
FEV_1 % predicted	103 (14)	99 (15)	58 (15)* †
Skin AGE (AU)	2.2 (0.4)	2.5 (0.6)	2.9 (0.5)* †
Serum AGE‡ (pg/ml)	3863.7 (2.3)	2691.5 (1.8)	3388.4 (1.9)
Serum soluble RAGE‡ (pg/ml)	81.3 (1.9)	41.4 (2.2)	33.8 (3.3)*

*$p<0.05$ compared to control never smoker.
†$p<0.05$ compared to control smoker.
‡=arithmetic mean (SD).

Conclusions People with COPD have increased skin AGE compared to subjects with a smoking history and control never smokers. Subjects with COPD also have decreased serum soluble RAGE levels compared to never smokers. The FEV_1 % was an independent variable of skin AGE. Further research should explore the potential role of AGE in the co-morbidities of COPD.

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P41 COGNITIVE DYSFUNCTION IN HOSPITALISED PATIENTS PRIOR TO DISCHARGE FOLLOWING ACUTE EXACERBATION OF COPD

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Rationale Cognitive impairment is one of the least well-studied COPD comorbidities. It occurs in a proportion of hypoxemic patients, but its presence during acute exacerbation has not been established. We assessed neuropsychological performance in patients awaiting discharge from hospital following acute exacerbation and compared them to healthy controls and stable normoxic outpatients with COPD.

Methods 109 participants were recruited: 29 COPD in-patients medically fit and awaiting discharge following an exacerbation (COPD-E), 50 stable COPD patients (COPD-S), and 30 controls. Neuropsychological tests measured performance in episodic memory, executive function, working memory, visuo-spatial function, processing speed and an estimate of premorbid abilities.

Results Unrecognised, moderate to severe impairment was found in over half of COPD-E with the most frequent impairment in immediate verbal episodic memory (55%), delayed visual episodic memory (54%), executive function (52%), working memory (52%), visuo-spatial function (50%) and processing speed (48%). Post hoc analysis confirmed COPD-E group observations were significantly low ($p<0.05$; Abstract P41 table 1). COPD-E were significantly worse than COPD-S patients in episodic and working memory independent of premorbid ability, hypoxaemia, disease severity, cerebrovascular risk or pack years smoked. In addition 20% of COPD-E demonstrated an acquired pathological loss in processing speed.

Abstract P41 Table 1 Group comparison: frequency and severity of cognitive impairment

Cognitive test	COPD-E impaired	COPD-S impaired	CONTROL impaired	(χ^2) Value	df	p Value
Visual memory IR	52%	36%	23%	5.0	2	0.08
Visual memory DR	54%	32%	13%	10.7	2	0.005
Verbal memory IR	55%	24%	10%	15.7	2	<0.001
Verbal memory DR	14%	4%	3%	3.6	2	0.17
Trail making (switching)	52%	40%	7%	14.9	2	0.01
Verbal fluency	43%	10%	7%	16.8	2	<0.001
Working memory index	52%	18%	10%	16.0	2	<0.001
Processing speed index	48%	24%	3%	16.0	2	<0.001
Visuo-spatial	50%	30%	0%	16.0	2	<0.001

Proportion of individuals with moderate to severe cognitive impairment.
DR, Delayed Recall, IR, Immediate Recall.

Conclusion Around half of patients with acute exacerbation were discharged home with unrecognised moderate to severe cognitive impairment. Patients with an acute exacerbation have worse episodic and working memory than stable patients and appear to have an acquired loss in processing speed. It is unclear whether this loss is acute, chronic or reversible.