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and pulmonary function tests (PFT), BODE index, and St. George Respiratory Questionnaire (SGRQ).

100 patients diagnosed by GOLD criteria were included to the study. A questionnaire that include sociodemographic findings as well as CAT, PFT, SGRQ, and BODE index were assessed for each patient.

90 of the patients (90%) were male and mean age was 63.25 ± 9.55 years. 43% patients had comorbidities. There were 3 patients (3%) in stage 1, 40 patients (40%) in stage 2, 41 patients (41%) in stage 3, and 16 patients (16%) in stage 4. The correlation between COPD stage and exacerbation number in a year, hospitalization in a year, FEV₁, FEV₁/FVC, six minute walk test, CAT score, SGRQ scores (impact, activity, symptom, total), BODE score, and MMRC score was observed ($p < 0.001$). When the relation of these parameters between each other was investigated, high degree correlation between each other was observed (Pearson correlation test). The correlation of CAT and SGRQ scores was higher than other.

Table 1. Correlation of CAT, functional parameters and SGRQ scores (Pearson correlation test)

	FEV ₁	BODE	mMRC	Syptom Score	Impact Score	Activity Score	Total Score
CAT p (r)	0,000 (-0,554)	0,000 (0,789)	0,000 (0,845)	0,000 (0,835)	0,000 (0,873)	0,000 (0,778)	0,000 (0,903)

Exacerbation number in a year and hospitalization in a year was related with all the parameters above.

High degree correlation between CAT and functional tests and quality of life in COPD patients and also correlation between these parameters and disease stage was observed. CAT can be used as simple, practical test when PFT were unavailable or there was not enough time to apply quality of life questionnaire.

P2281

The impact of airflow obstruction, *P. aeruginosa* infection and psychological factors on cognitive function in bronchiectasis patients

Syba Sunny¹, Paul McAlinden¹, Therese Small¹, Julia Newton², Anthony De Sozza^{3,1},¹Sir William Leech Centre for Lung Research and Freeman Hospital Bronchiectasis Service, Freeman Hospital, Newcastle upon Tyne, United Kingdom; ²Institute for Ageing and Health, Newcastle University, Newcastle upon Tyne, United Kingdom; ³Institute of Cellular Medicine, Newcastle University, Newcastle upon Tyne, United Kingdom

Introduction: Bronchiectasis is a chronic lung sepsis syndrome: whilst acute sepsis is associated with cognitive dysfunction, there is little data for chronic lung sepsis. We have compared cognitive function to relevant factors, e.g. airflow obstruction and *P. aeruginosa* infection.

Methods: Adult Bronchiectasis patients from clinic (3 months) were screened. Cognitive function was determined by the Cognitive Failures Questionnaire (CFQ), a self-reported measure; poor memory has a high score and ≥ 40 is abnormal. We recorded airflow limitation (FEV₁), MRC dyspnoea (MRCD) and *P. aeruginosa* infection. The Hospital Anxiety and Depression Scale assessed anxiety (HADS-A) and depression (HADS-D). Fatigue was measured by Fatigue Impact Scale (FIS; abnormal > 40).

Results: We studied 69 patients (44F, 25M); mean age of 60 (SD 14.2). Mean FEV₁ % predicted was 69.0% (SD 30.2); 24 patients (35%) had chronic *P. aeruginosa* infection. Mean HADS-A score: 7.5, mean HADS-D: 4.4 and mean FIS: 38.7. Mean CFQ was 34.9 (SD 18.6); 30 patients (43%) reported a score of ≥ 40 . No correlation was found between CFQ and FEV₁ % pred (linear regression, $p=0.437$) nor with MRCD or *P. aeruginosa* infection ($p=0.292$, $p=0.587$). HADS-A scores were significantly associated with high CFQ scores ($r^2 = 0.37$, $p < 0.001$), as were HADS-D scores ($r^2 = 0.33$, $p < 0.001$) and FIS scores ($r^2 = 0.37$, $p < 0.001$).

Conclusions: Cognitive dysfunction may be a co-morbidity in Bronchiectasis patients and is associated with anxiety, depression and fatigue. However, it does not appear to be related to objective markers of disease severity.

P2282

Asthma control and demographic, nutritional, functional and quality of life

Carmen Centeno, Carlos Martinez, Zoran Stojanovic, Nuria Bruguera, Jorge Abad, Ignasi Garcia, Marisol Prats, Juan Ruiz-Manzano, Josep Morera. *Pneumology, Hospital Universtario Germans Trias i Pujol, Badalona, Barcelona, Spain*

We studied if the Asthma Control Test (ACT) is related to nutritional and inflammation status, symptoms, lung function and quality of life (QOL).

Methods: Prospective cross-sectional study with 3 groups: ACT < 15 , ACT 15-20 and ACT > 20 ; assessing: demographic data, nutritional and inflammation status, lung function, number of exacerbations, hyperventilation syndrome (Nijmegen Questionnaire, NQ) and QOL (St. George's Respiratory Questionnaire, SGRQ).

Results: 81 patients (19 men, 62 women, 47.4 ± 16.1 years). Average ACT was 18.7 ± 5 (poorly controlled group, PCG 22.2% vs well-controlled group, WCG 50.62%). There were significant differences in the 3 groups.

Using Bonferroni test, the differences were based on PCG and WCG. Only in dyspnea, FEV₁%, NQ and SGRQ, we saw significant differences between partial and PCG. Multiple linear regression considered activity and symptoms (SGRQ) as independent variables. There were no differences in nutrition and inflammation, except for the CRP.

254. Quality of life and clinical parameters in monitoring airway diseases

P2280

Relation between COPD assessment test "CAT™" and functional parameters and quality of life in COPD patients

Selim Erkan Akdemir¹, Arzu Yorgancioglu¹, Yavuz Havlucu¹, Levent Ozdemir², Tugba Goktalay¹, Aysin Sakar Coskun¹, Pinar Celik¹.¹Chest Disease, Celal Bayar University Medical Faculty, Manisa, Turkey; ²Chest Disease, Dortyol State Hospital, Hatay, Turkey

The aim was to investigate the relation between COPD assessment test (CAT™)

Table 1

	PCG	Partially	WCG	P
Age	49.7±14	51.7±16	44.2±16	NS
BMI	28.9±6	29.6±6	27.1±5	NS
% Severe asthma	94	62	32	0.000
FEV1%	65.4±20	76.3±17	82.8±18	0.006
No. exacerbations	4±3	2.4±3	0.8±0.9	0.002
Dispnea MRC	1.12±0.8	1.19±0.8	0.32±0.5	0.000
CRP	9.2±12	3.1±1.9	3.1±3.7	0.034
NQ	24.2±8.5	26±10	15±9	0.000
SGRQ	60.8±16.8	55.2±15	37±11.4	0.000
Activity	71.8±22	63.5±22	36.2±20	0.000
Symptoms	61.8±19.8	56±12	43.8±11.8	0.002
Impact	54±16	49.2±18	35.4±11	0.001

Conclusions: The difference between the three groups was at the expense of that between PCG and WCG. PCG presented severe course of disease, worse lung function, hyperventilation, some degree of inflammation, increased number of exacerbations and poorer QOL. There was no relationship between worse asthma control and nutrition.

P2283

New GOLD 2011 guidelines: Is there an improvement?

Ana Sofia Santos, Ricardo Coelho, Sofia Granadeiro, Raquel Rosa, Alexandra Borba, Inês Gonçalves, Paula Cravo, Alexandra Mineiro, Salvador Coelho, Maria João Gomes, Joao Cardoso. *Pneumologia, Hospital de Santa Marta, Lisboa, Portugal*

Background: The 2011 revision of GOLD report establishes a new assessment of COPD based on the patient's level of symptoms, spirometric classification and exacerbation history.

Aim: To compare and establish the differences between the classification of COPD patients using the guidelines of GOLD report 2010 and 2011.

Methods: A prospective study with a group of consecutive COPD patients from our outpatient clinic was performed. They were assessed according to GOLD 2011 by answering COPD Assessment Test (CAT) and Modified British Medical Research Council (mMRC) Questionnaire; by a spirometric evaluation in the same day and by reviewing the history of exacerbations of the previous year. This data was compared with the GOLD 2010 COPD assessment of the same patients.

Results: 45 patients were included (mean age 62,3 (±9); 73% male). The results are as below:

2010 GOLD stage	CAT ≥ 10 (%)	mMRC ≥ 2	2011 GOLD grade	2011 Risk group	Exacerbations ≥ 2	2011 COPD assessment (n)
1 (n=8)	38	25	1 (n=8)	A-5; B-3	0	A-6
2 (n=12)	92	75	2 (n=12)	A-1; B-11	0	B-14
3 (n=12)	83	75	3 (n=12)	C-2; D-10	1	C-2
4 (n=13)	100	100	3 (n=8); 4 (n=5)	D-13	9	D-23

In GOLD 2010 classification 92% stage 4 patients had chronic respiratory failure; of those 62% are GOLD grade 3 in the 2011 spirometric assessment.

Conclusions: GOLD 2010 stage 4 patients were the group with greater exacerbation history. With exception for GOLD 2010 stage 1 patients, which were mainly assessed as group A in the 2011 GOLD classification, the remaining patients were mostly placed in the groups with greater symptomatic impact (B and D), which was better assessed by CAT. This shows the burden of disease in patient's life and the need of a better treatment management, which is one of the goals of the 2011 COPD assessment.

P2284

Impact of cognitive dysfunction and neuro-psychiatric symptoms over quality of life in stable COPD patients

Prem Parkash Gupta¹, Hitesh Khurana², Sachin Bansal¹, Dipti Agarwal³. ¹TB & Respiratory Medicine, PGIMS, University of Health Sciences, Rohtak, Haryana, India; ²Psychiatry, PGIMS, University of Health Sciences, Rohtak, Haryana, India; ³Physiology, PGIMS, University of Health Sciences, Rohtak, Haryana, India

Background: Extrapulmonary manifestations in COPD contribute to its morbidity.

Aims: To assess quality of life, cognitive functions and neuro-psychiatric symptoms in COPD patients and to analyze if quality of life is influenced by cognitive dysfunctions or neuro-psychiatric symptoms.

Methods: 200 stable COPD patients and 50 healthy volunteers [HV] were included. *St. George Respiratory Questionnaire* (SGRQ) was used to assess quality of life. *PGI Memory Scale Questionnaire* (PGIMSQ) was used to assess cognitive functions under 10 subsets: remote & recent memory, mental balance, attention and concentration, delayed recall, immediate recall, retention for similar & dissimilar pair, visual retention, and recognition. *Symptom Check List 80 Questionnaire* (SCL-80) was used to assess neuro-psychiatric symptoms under 9 subscales: depression, anxiety, interpersonal sensitivity, somatisation, phobic anxiety, obsessive compulsive neurosis, anger hostility, paranoid ideation, and additional symptoms.

Results: SGRQ scores in COPD patients for symptom, activity, impact subcategories were 28.74±8.3, 35.4±10.2 and 24.3±7.6, respectively. SGRQ scores in HV subjects for these subcategories were 2.2±0.94, 1.12±0.66 and 0.84±0.87, respectively. 105 COPD patients had PGIMSQ scores suggestive of cognitive impairment. 138 COPD patients had one or more neuro-psychiatric symptom. The SGRQ scores were correlated with remote memory, recognition, immediate & delayed recall, depression, verbal retention for dissimilar pair, and visual retention.

Conclusions: Many COPD patients have cognitive dysfunctions and neuro-psychiatric symptoms that have significant impact over their quality of life.

P2285

Comparison of life quality between patients with COPD and victims of chemical warfare using CAT (COPD assessment test) questionnaire

Abbas Fadajii¹, Fateme Hamidiimani¹, Bahador Bagheri², Bahar Taherhanchi¹. ¹Internal Medicine, Shahid Beheshti Medical University, Tehran, Islamic Republic of Iran; ²Pharmacology, Tabriz Medical University, Tabriz, Islamic Republic of Iran

Introduction: In COPD, measurement of health-related quality of life is a descriptive tool to estimate prognosis of the disease. Victims of chemical warfare who have small airway involvement are considered as a group of patients with COPD, yet in comparison with COPD patients who are smokers they have differences in severity of signs and symptom. The purpose of our work was to compare life quality in two groups of COPD patients using CAT questionnaire.

Materials and methods: The first group was composed of 40 patients who were smokers for at least 20 years. The second group was made of 45 patients who were victims of chemical warfare. They were not smokers. Both groups were male and both groups had obstructive pattern in spirometry (minimum criterion FEV1/FVC < 70%). Patients baseline characteristics and spirometry volumes were recorded and then subjects filled the CAT questionnaire.

Results: In group A, CAT scores varied from 2 to 34, mean= 19.25. FEV1 varied from 17% to 67%, mean= 33.14, and FVC ranged from 36.9% to 80%, mean=51.14. In group B CAT scores varied from 5 to 39, mean= 22.25. FEV1 varied from 17.5% to 89%, mean= 53.14, and FVC ranged from 22.9% to 100%, mean=61.12. Victims of chemical warfare in spite of significantly higher mean of respiratory volumes, had higher CAT total score.

Conclusion: In conclusion we can say although victims of chemical warfare with small airway disease have higher respiratory volumes, their quality of life is lower than other COPD patients.

P2286

The performance of COPD assessment test (CAT) in mustard lung patients

Shahrazad Mohammadzadeh Lari¹, Hassan Ghobadi Marallu², Davood Attaran¹, Mohammad Towhidi¹, Afsoun Mahmoudpour². ¹Lung Disease & Tuberculosis Research Center, Mashhad University of Medical Sciences, Mashhad, Islamic Republic of Iran; ²Internal Medicine, Ardebil University of Medical Sciences, Ardebil, Islamic Republic of Iran

Introduction: Mustard lung is a form of chronic obstructive pulmonary disease (COPD) due to sulfur mustard exposure. Health-related quality of life (QOL) is an important part of management in mustard lung patients. The properties of COPD assessment test (CAT), in COPD patients have been well documented. The aim of this study was to determine the role of CAT in evaluating the QOL in mustard lung patients.

Methods and materials: Eighty- six consecutively patients with stable COPD with all levels of severity were enrolled into this study. The QOL was evaluated by CAT and ST George Respiratory Questionnaires (SGRQ). Also standard spirometry, 6 minute walk test (6MWT), and pulse oxymetry were performed in patients. Severity of COPD was evaluated by GOLD (Global initiative for chronic Obstructive Lung Disease) and BODE (body mass index, obstruction, dyspnea, exercise) index.

Results: The mean age of the patients was 47.30±7.08 SD years. The mean CAT score was 26.03±8.28SD. Thirty-five (43%) patients were in CAT stage 3. There was statistically significant correlation between CAT with SGRQ (p= 0.001) and BODE index (p=0.001) respectively. Also statistically significant inverse correlation was found between CAT score with FEV1 (p=0.03) and 6MWT (p=0.001) respectively. There was statistically significant difference in mean CAT score between patients in GOLD stages ≥3 and those with <3 (p=0.02).

Conclusion: The findings of this study revealed that CAT questionnaire as a simple tool for assessment of QOL in mustard lung patients is valuable and can be used in clinical practice.

P2287

The relationship between COPD assessment test (CAT) scores and severity of airflow obstruction in stable COPD patients

Hassan Ghobadi Marallu, Saeid Sadeghieh-ahari, Shahrazad Mohammadzadeh Lari. *Internal Medicine, Ardebil University of Medical Sciences, Ardebil, Islamic Republic of Iran Community Medicine, Ardebil University of Medical Sciences, Ardebil, Islamic Republic of Iran Internal Medicine, Mashad University of Medical Sciences, Mashad, Islamic Republic of Iran*

Background: COPD is a major cause of morbidity in smokers. The COPD as-

assessment test(CAT)is a validated test for the evaluation of COPD impact on health status.Although CAT is not a diagnostic test and pulmonary function test(PFT)remains the important diagnostic test, its predictive value for evaluation of disease impact is weak.The purpose of this study was to determine the relationship between the CAT score and PFT in stable COPD.

Method: We evaluated 105 patients with stable COPD.Severity of airflow obstruction assessed by spirometry and classified by the Global initiative for Obstructive Lung Disease(GOLD)criteria.Then,the impact of COPD on health status was assessed by CAT.

We statically compared interrelationship between CAT score,COPD stages,CAT groups and PFT.

Results: The mean age and mean period of smoking(p/y) were59.60m11.93SD and 35.43±15.33SD respectively.The mean FEV_{1%}predicted was71.01±26.70SD. The mean CAT score was19.61±8.07SD. Correlations between the severity of smoking by GOLD stages was significant(p=0.006).There was a significant difference between the FEV_{1%}predicted and total CAT score(r= -0.55, p< 0.001). The comparison of mean FEV_{1%}predicted with mean score of CAT groups 1, 2, 3, and 4 were significant(p<0.001).

Conclusion: The relationship between CAT score and FEV_{1%}suggests that CAT is linked to severity of airflow limitation and GOLD stages in COPD.Health status as measured by CAT worsens with severity of airflow limitation.

P2288

Comparison of active cycle breathing technique (ACBT)/forced expiration technique (FET) vs. flutter device in facilitating sputum expectoration among stable COPD patients at UST hospital

Roland Panaligan², Flordeluna Mesina¹, Marilyn Mateo². ¹Medicine, UST Hospital, Manila, Philippines; ²Pulmonary and Critical Care, UST Hospital, Manila, Philippines

Background: Airway clearance techniques are available to avoid the vicious cycle of colonization and infection of bronchi among COPD patients. The efficacy of these techniques needs to be looked into.

Objective: To determine if a flutter device is as effective as the ACBT in facilitating sputum expectoration among stable COPD patients.

Methods: A randomized controlled open labelled trial was done from July to October 2011 at the USTH OPD. A total of twenty two patients (22) were randomized and trained to the lung flute group (n=12) and active cycle breathing technique/force expiration technique (ACBT/FET) group (n=10). Sputum volume and level of difficulty of sputum expectoration was recorded.

Results: The mean sputum volume for 3 days was relatively higher among patients on ACBT/FET (6.58 + 2.94 ml) compared to the Lung Flute group (5.90 + 2.99 ml) however there was no statistical difference (p=0.525). Sixty seven percent (8/12) of the subjects expectorated mucopurulent sputum in the lung flute group compared to 50% (5/10) in the ACBT/FET group. The mean visual analog score of the Lung Flute group was 6.83±1.11 with a relief of difficulty to VAS 2.8±0.63 post-treatment compared to the ACBT group with pre-treatment and post-treatment score of 6.6±0.97 and 3.0±0.74, respectively. There was significant relief in difficulty of sputum expectoration for both groups with a p-value of <0.0001.

Conclusion: The use of a flutter devices is as effective as the Active Cycle Breathing Technique (ACBT)/Forced Expiration Technique (FET) in facilitating sputum expectoration among stable COPD patients.

P2289

Acute respiratory assessment service

Naureen Aslam, Su Win, Joanne Thompson, Amanda Bell, Helena Cummings, Jaymin B. Morjaria, Jack Kastelik. *Respiratory Medicine, HEY NHS Trust, Hull, East Yorkshire, United Kingdom*

Background: Acute respiratory disorders are a large burden to the acute medical services in any healthcare system. East Yorkshire has high prevalence of respiratory disorders. There are two large teaching hospitals under one institution providing care to a population of around 600,000 people including a mixture of inner city and rural areas.

Aim: To retrospectively review the outcomes of a new nurse-led specialist respiratory assessment service supported by respiratory consultants.

Methods: We developed an Acute Respiratory Assessment Service (ARAS); a team of 3 specialist respiratory nurses supervised by 2 consultant respiratory physicians. The ARAS team reviewed on a twice daily basis all acute respiratory admissions to the acute medical specialist unit in our hospitals. They were assessing in-patients on medical wards and intensive care and providing early supportive discharges. The ARAS team worked with community-based respiratory, oxygen, dieticians and smoking cessation services.

Results: Over 6 months period a total 606 patients were managed through ARAS; 342 had COPD, 50 asthma, 75 pneumonia, 70 lower respiratory tract infection (LRTI), and 63 with other respiratory conditions. A large proportion of patients were discharged from hospital within 96 hours; 185 (54%) with COPD, 36 (72%) with asthma, 39 (56%) with LRTI, 34 (54%) with pneumonia. ARAS team also supported discharge of patients with longer hospital stay. 13% of patients with COPD and asthma were readmitted within 30 days.

Conclusion: A dedicated specialist service provides high standard of care for patients with respiratory problems and works as a link between the acute hospital

and community services resulting in a reduction length of hospital stay with low readmission rates.

P2290

Assessment of cognitive functions in stable COPD patients using PGI Memory Scale and to analyze for their correlation with patients' characteristics and BODE index

Prem Parkash Gupta¹, Hitesh Khurana², Sachin Bansal¹, Dipti Agarwal³. ¹TB & Respiratory Medicine, PGIMS, University of Health Science, Rohtak, Haryana, India; ²Psychiatry, PGIMS, University of Health Science, Rohtak, Haryana, India; ³Physiology, PGIMS, University of Health Science, Rohtak, Haryana, India

Background: COPD is a multisystem disorder with significant extrapulmonary manifestations.

Aims: To assess cognitive functions in stable COPD patients using PGI Memory Scale Questionnaire [PGIMSQ] and to seek for any correlation with patients' characteristics and BODE index variables.

Methods: We included 200 stable COPD patients and 50 healthy volunteers [HV]. Their baseline characteristics and BODE index variables were assessed. PGIMSQ was used to assess cognitive functions under 10 subsets (shown in Table 1).

Results: The age of subjects in COPD group was 61.37±7.4 year, and of those in HV group was 59.76±7.21 year. 105 COPD patients (52.5%) were having PGIMSQ scores beyond ± 3 SD of HV scores. PGIMSQ scores are shown in Table 1.

Table 1

PGIMSQ Subsets [Max. score]	COPD group	HV group
Remote memory [6]	3.56±1.12	4.64±0.49
Recent memory [5]	3.96±0.49	4.30±0.46
Mental balance [9]	6.48±1.56	8.08±0.88
Attention and concentration [15]	9.68±3.07	13.08±0.72
Delayed recall [10]	6.06±1.35	7.40±0.49
Immediate recall [12]	7.24±1.09	8.34±0.48
Verbal retention for similar Pair [5]	3.68±0.74	4.16±0.37
Verbal retention for dissimilar Pair [15]	5.92±1.56	7.22±0.93
Visual Retention [13]	6.04±1.44	7.62±0.49
Recognition [10]	5.48±1.13	6.30±0.46
PGIMSQ score [100]	57.5±11.49	69.7±3.75

Age, duration of illness, MMRC dyspnea and BODE index scores had inverse correlations with PGIMSQ scores. FEV₁ and distance walked in six minute had positive correlations with PGIMSQ scores.

Conclusions: We observed a global decline of cognitive functions in COPD group and observed their significant correlations with age, duration of illness and BODE index variables.

P2291

An analysis for neuro-psychiatric symptoms in stable COPD patients and to assess for their correlation with patients' characteristics and BODE index

Prem Parkash Gupta¹, Hitesh Khurana², Sachin Bansal¹, Dipti Agarwal³. ¹TB & Respiratory Medicine, PGIMS, University of Health Sciences, Rohtak, Haryana, India; ²Psychiatry, PGIMS, University of Health Sciences, Rohtak, Haryana, India; ³Physiology, PGIMS, University of Health Sciences, Rohtak, Haryana, India

Background: COPD is known to have significant extrapulmonary involvement that contributes to COPD morbidity.

Aims: To assess neuro-psychiatry symptoms in stable COPD patients using *Symptom Check List 80 Questionnaire* [SCL-80] and to seek for any correlation between these symptoms and COPD severity.

Methods: We included 200 stable COPD patients and 50 healthy volunteers (HV). The COPD subjects had a smoking history > 20 pack years. SCL-80 was used to assess neuro-psychiatric symptoms under 9 subscales (table 1).

Results: The age of subjects in HV group was 59.76±7.21 year, and of those in COPD group was 61.37±7.4 year. 138 COPD patients (69%) had neuro-psychiatric symptom(s) detected using SCL-80. The SCL-80 scores are shown in table 1.

Age, duration of illness, smoking pack years, MMRC dyspnea and BODE index

Table 1

Subscales (Max. Score)	COPD group	HV group	p value
Somatisation (48)	13.04±7.83	2.48±1.15	<0.001
Depression (52)	13.22±8.86	0.24±0.43	<0.001
Paranoid ideation (24)	0.82±0.77	0.32±0.47	<0.001
Interpersonal sensitivity (36)	1.05±0.05	0.78±0.51	>0.05
Anxiety (40)	9.64±7.31	0.26±0.44	<0.001
Phobic anxiety (28)	9.14±6.48	0.08±0.34	<0.001
Obsessive compulsive (40)	10.18±6.96	0.08±0.27	<0.001
Anger hostility (24)	1.10±0.70	0.92±0.49	>0.05
Additional (28)	1.09±0.71	0.94±0.37	>0.05
SCL-80 scores (320)	59.94±37.3	4.96±2.29	<0.001

scores had positive correlations with SCL-80 scores. FEV₁ and distance walked in six minute had inverse correlations with SCL-80 scores.

Conclusions: 69% stable COPD patients had neuro-psychiatric symptom(s) detected using SCL-80, and the SCL-80 scores had significant correlations with age, smoking pack years, duration of illness and BODE index variables.

P2292

Cross-sectional analysis of the Belgian Severe Asthma Registry

Florence Schleich¹, Guy Brusselle², Renaud Louis¹, Olivier Vandenplas³, Charles Pilette⁴, Rudi Peche⁵, Guy Joos². ¹Respiratory Medicine, CHU Sart-Tilman, Liege, Belgium; ²Dept Respiratory Medicine, Ghent University Hospital, Ghent, Belgium; ³Respiratory Medicine, Clinique Universitaire Mont Godinne, Yvoir, Namur, Belgium; ⁴Respiratory Medicine, Cliniques Universitaires St Luc, Bruxelles, Belgium; ⁵Respiratory Medicine, CHU Charleroi, Vésale, Charleroi, Belgium

The Belgian severe asthma registry (BSAR) is a secured web-based registry encompassing demographic, clinical, functional and inflammatory data of severe adult asthmatics as defined by the ATS, aiming at raising awareness on severe asthma, studying its natural history, identifying phenotypes, and offering tools to optimize care.

Methods: The cross-sectional analyses of the BSAR included 229 refractory asthmatics from 7 Belgian centers, followed up by respiratory physicians for at least one year prior to inclusion.

Results: Severe asthma was more frequent in women (56%), was associated with atopy (69%) and started early (71% before age 40). 10% were current smokers and 32% ex-smokers. In addition to high doses of ICS+LABA, 48% of patients received LTRA, 21% anti-IgE and 21% oral corticosteroids. Despite impaired flow rates (mean FEV₁=70% pred; FEV₁/FVC=63%), KCO was well preserved (98% pred).

Eosinophilic asthma (sputum Eos \geq 3%) was the predominant phenotype (60%, n=45) while neutrophilic (sputum Neu \geq 76%) and paucigranulocytic asthma were 22% and 13% respectively. The median FE_{NO} was 22ppb (4-250ppb) and the fraction of patients with FE_{NO} \geq 50ppb was 17% (n=155). Comorbidities included chronic rhinosinusitis (58%), nasal polyposis (21%), oesophageal reflux (36%), obesity (48%) and depression (18%). Asthma control assessed by ACT and ACQ was impaired (85% had ACT<20 and 87% had ACQ>0.75) and average AQLQ was 4.39.

Conclusion: In the BSAR, severe asthmatics are characterized by airflow limitation, frequent comorbidities, poor asthma control and quality of life. Paucigranulocytic asthma represents a rare phenotype while a high proportion of severe asthmatics have uncontrolled eosinophilic airway inflammation.

P2293

Impact of short term supervised breathing exercises added to regular medications over nocturnal symptoms, requirement of rescue medication and spirometric variables in asthma patients

Dipti Agarwal¹, Sushma Sood¹, Prem Parkash Gupta². ¹Dept. of Physiology, PGIMS, University of Health Sciences, Rohtak, Haryana, India; ²Dept. of TB & Respiratory Medicine, PGIMS, University of Health Sciences, Rohtak, Haryana, India

Background: Breathing exercises have been described to be useful in asthma management by a few workers.

Objective: To assess efficacy of breathing exercises [Pranayamas] in asthma patients on optimal medications using spirometric indices, nocturnal symptoms parameters and requirement of rescue medication.

Methods: 60 stable asthma patients [34 females], on optimal regular medications as per GINA guidelines for \geq 3 months, were enrolled. All subjects continued their respective medications during study period and, in addition, performed seven breathing exercises (BE) for a period of 3 months initially under full and thereafter intermittent supervision at Yoga centre in our Institute. Spirometry, nocturnal symptoms and requirement of rescue medicine (salbutamol, given via an MDI) were assessed before and after study period.

Results: The mean age of asthma patients was 25.45 \pm 5.41 years. After study period, mean FEV₁ increased from 2.492 \pm 0.358 L to 2.745 \pm 0.343 L and mean PEF_R increased from 283.82 \pm 51.12 L/min to 336.23 \pm 51.47 L/min; all increases were statistically significant. The mean days with nocturnal symptoms/week decreased significantly from 1.417 \pm 1.619 to 0.067 \pm 0.362. The requirement of rescue medication decreased significantly from 6.23 \pm 2.95 to 0.90 \pm 1.25 puffs/week.

Conclusions: Breathing exercises, when added to regular medications, observed to be beneficial in stable asthma patients leading to significant improvements in spirometric parameters and significant reduction in nocturnal symptoms as well as requirement of rescue medicine.

P2294

The German severe asthma register

Stephanie Korn¹, Marisa Hübner¹, Karl-Christian Bergmann², Antje Jahn³, Peter Kardos⁴, Andrea Koch⁵, Marek Lommatzsch⁶, Eckhard Hamelmann⁷, Roland Buhl¹. ¹Pulmonary Dept., Mainz University Hospital, Mainz, Germany; ²Allergy-Centre-Charité, Charité – Universitätsmedizin Berlin, Berlin, Germany; ³IMBEL, Mainz University Hospital, Mainz, Germany; ⁴Lungenpraxis Maingau, Lungenpraxis Maingau, Frankfurt, Germany; ⁵Pulmonary Department, University Hospital Bergmannsheil, Bochum, Germany; ⁶Pulmonary Department, Rostock University Hospital, Rostock, Germany; ⁷Children's Hospital, Ruhr University, Bochum, Germany

Patients with severe persistent asthma represent the highest unmet medical need among the asthmatic population today.

To improve the understanding of more severe disease progresses in pediatric and adult asthma the German Asthma Net (GAN e.V.) launched a National Severe Asthma Register in December 2011. Enrolled patients undergo detailed clinical and physiologic evaluations, including patients' medical history, allergy, lung function, lung inflammation, blood testing as well as past and concomitant medication and comorbidities. As of February 20, 2012 six participating centers joined the program and recruited 93 subjects (mean age \pm SEM 49 \pm 1 years, 63% female, FEV₁ 2.0 \pm 0.1 L (65.3 \pm 2.1%), 97% uncontrolled or partly controlled asthma according to GINA, 54% allergic asthma, 46% on oral corticosteroids, 39% on omalizumab, eNO 51 \pm 6 ppb, 3.4 \pm 0.4 exacerbations during the last 12 months). Recruitment of a larger number of subjects with severe asthma, including children, is ongoing and will allow further characterization of clinical, physiologic, cellular and biochemical factors related to severe disease in a longitudinal assessment to identify parameters that improve diagnosis, phenotyping, management and treatment of this heterogeneous condition. In addition, the German Severe Asthma Register may help to confirm and extend results obtained in similar databases, including U-BIOPRED and SARP.

P2295

Factors affecting quality of life in children, adolescents and adults with primary ciliary dyskinesia

Neil Botting¹, Audrey DunnGalvin², Fiona Copeland³, Jane Lucas¹. ¹PCD Group, Faculty of Medicine, University of Southampton, United Kingdom; ²Paediatrics and Child Health, University of Cork, Ireland; ³PCD Family Support Group, Milton Keynes, United Kingdom

Background and objective: Primary Ciliary Dyskinesia (PCD) is a rare autosomal recessive disorder associated with chronic pulmonary disease, rhinosinusitis, serous otitis media and often infertility. We are developing a health-related quality of life (QoL) questionnaire for patients with PCD as an outcome measure. We present data generated during the development of the questionnaire.

Methods: Factors affecting QoL in PCD were generated by patients, health-specialists and a literature review. The list of items was sent to members of the UK PCD Support Group, ERS PCD Taskforce and Southampton patients. 100 questionnaires were returned, with items ranked on a Likert scale (1=not at all relevant, 5=very relevant). Mean values for each item were calculated. Semi-structured interviews are being conducted with each age group.

Results: The emotional impact of the disease ranked highly for adults and adolescents. For example in adolescents, 'embarrassment from having a runny nose' had the highest mean score (4.11), whilst 'physical problems from symptoms of PCD' was less of an issue (2.56). Lack of understanding about PCD by others was highly relevant for all age groups, but particularly children, whose classmates did not understand (4.43). PCD was reported to have little impact on social life in at all ages.

Conclusions: Patients of all age groups reported emotional consequences and embarrassment from PCD. Adults reported physical symptoms to be more relevant than in children or adolescents. The prototype questionnaire with the most relevant items is nearing completion. Cross-sectional and longitudinal validation will be conducted in UK, Ireland and USA.

P2296

Determinants of asthma control and quality of life in stable asthma

Minna Purokivi, Heikki Koskela, Kirsi Kontra. Center for Medicine and Clinical Research, Division of Respiratory Medicine, Kuopio University Hospital, Kuopio, Finland Center for Medicine and Clinical Research, Division of Respiratory Medicine, Kuopio University Hospital, Kuopio, Finland Department of Pharmacy, Kuopio University Hospital, Kuopio, Finland

Asthma control and quality of life are poorly associated with traditional asthma biomarkers. In the present study we evaluated two new cough provocation tests in this respect.

Asthma Control Questionnaire and Leicester Cough Questionnaire were completed by thirty-six stable asthmatics. Cough provocation tests with hypertonic saline (Koskela HO et al. Clin Exp Allergy. 2008 Jul;38(7):1100-7) and isocapnic hyperpnoea of dry air were performed (Purokivi M. et al. Cough. 2011;7(1):8), as well as spirometry, ambulatory peak expiratory flow (PEF) monitoring, and exhaled nitric oxide measurement (eNO).

Leicester Cough Questionnaire score correlated closely with cough responsiveness to hypertonic saline and isocapnic hyperpnoea of dry air (Rs = -0.66, p<0.001

and $R_s = -0.49$, $p=0.002$, respectively). Asthma Control Questionnaire also correlated with the cough responsiveness to these challenges ($R_s = 0.52$, $p=0.001$ and $R_s 0.43$, $p=0.008$, respectively). FEV₁ (%predicted), diurnal PEF variation and eNO did not correlate with cough-related quality of life but showed some association with asthma control. There was a significant correlation between Leicester Cough Questionnaire and Asthma Control Questionnaire ($R_s = -0.54$, $p=0.001$).

Asthma control and cough-related quality of life are more closely associated with cough sensitivity to the investigated cough provocation tests than to eNO and traditional indices of bronchial obstruction. Cough is a major contributor to poor asthma control.

P2297

The inhaled corticosteroids questionnaire shortened version (ICQ-S): A brief patient-rated scale for monitoring inhaled corticosteroid side effects in clinical practice

Juliet Foster¹, Siebrig Schokker², Robbert Sanderman³, Dirkje Postma⁴, Thys van der Molen². ¹Woolcock Institute of Medical Research, University of Sydney, Australia; ²Department of General Practice, University of Groningen, University Medical Center Groningen, Netherlands; ³Department of Health Sciences, University of Groningen, Northern Center for Healthcare Research, University Medical Center Groningen, Netherlands; ⁴Department of Pulmonary Diseases, University of Groningen, University Medical Center Groningen, Netherlands

Introduction: A shortened 15-item version (ICQ-S) of the validated 57-item Inhaled Corticosteroids (ICS) side effects Questionnaire (ICQ) was developed to enable monitoring/management of side effects in busy clinics.

Aim: To determine the reliability, criterion validity and patient acceptability of the ICQ-S.

Methods: At days 0 and 14, adults with doctor-diagnosed asthma and prescribed an ICS inhaler, completed the ICQ, ICQ-S, 6-item ACQ and AQLQ(s). The intraclass correlation coefficient (ICC) between day 0 and 14 ICQ-S assessed test-re-test reliability. Cronbach's alpha (α) coefficient and item-total correlations tested the internal consistency of ICQ-S. Associations (Spearman's rho) between the ICQ and ICQ-S total score and relative associations of the ICQ and ICQ-S with the AQLQ(s) assessed criterion validity. Patients reported duration and perceived difficulty (1=very difficult, 5=very easy) of ICQ-S completion.

Results: 62 patients (female 63%, mean age 54 (SD 13) yrs., mean ACQ 0.79 (SD 0.83), median ICS dose 1000µg (IQR 500,1000)) were eligible. The ICC between day 0 and 14 ICQ-S scores was 0.90, α coefficient was 0.90 and all item-total correlations were $\rho \geq 0.20$. ICQ and ICQ-S were strongly associated ($\rho=0.86$) and similarly associated with the AQLQ(s) (ICQ $\rho=-0.58$, (ICQ-S $\rho=-0.62$). 81% patients completed the ICQ-S within 5 minutes and 97% reported that it was not difficult to fill in.

Conclusion: The ICQ-S is a patient-friendly tool which retains the reliability and validity of the original ICQ scale but is brief enough for monitoring/managing inhaled steroid side effects in clinical practice.

P2298

A study of neuromuscular dysfunction in patients with chronic obstructive pulmonary disease

Mohamed El-Senousey¹, Ehab S. Mohamed¹, Azza A. Ghali¹, Ahmed S. Mohamed¹. ¹Departments of Neurology, Tanta University Hospital, Faculty of Medicine, Tanta, Gharbia, Egypt; ²Departments of Neurology, Tanta University Hospital, Faculty of Medicine, Kafer Elshekh, Egypt; ³Departments of Neurology, Tanta University Hospital, Faculty of Medicine, Tanta, Gharbia, Egypt; ⁴Chest Department, Tanta University Hospital, Faculty of Medicine, Tanta, Gharbia, Egypt

Background: COPD is one of the most important diseases that affect quality of life. Although its effect on central nervous system is well known, but on the peripheral nervous system not well known. Peripheral neuropathy and/or myopathy are known to worsen quality of life of COPD patients

Objective: To evaluate the presence of peripheral neuropathy and myopathy in COPD patients.

Methods: 40 subjects were included in the study divided into 2 groups, group A included 20 patients with severe COPD and group B included 20 patients with moderate COPD and 15 healthy subjects as a control group. All patients subjected to clinical assessment. All subjects were subjected to respiratory functions tests, Clinical COPD Questionnaire (CCQ) and neurophysiological examination.

Results: 16 patients had peripheral neuropathy. 8 patients had proximal muscle weakness. Patients with neuropathy- myopathy were more hypoxic and hypercap-

nic. There is significant association between high scores of CCQ and poor quality of life in patients with neuropathy-myopathy.

Conclusion: Presence of neuropathy and myopathy added more burden on quality of life on COPD patients. Careful examination of COPD patients for subclinical neuropathy or myopathy is needed for early interference, management and slowing progression of the disease.

Reference:

[1] Fabbri LM, Luppi F, Rabe KF. Complex chronic co-morbidities of COPD. Eur Respir J. 2008; 31: 204-12.

P2299

The relationship between radiologic findings and lung function impairment in chronic obstructive pulmonary disease

Virginija Šileikiene^{1,2}, Ingrida Zeleckiene³, Mindaugas Mataciunas³, Jolita Norkuniene^{4,5}, Edvardas Danila^{1,2}. ¹Clinic of Infectious, Chest Diseases, Dermatovenereology and Allergology, Vilnius University, Vilnius, Lithuania; ²Centre of Pulmonology and Allergology, Vilnius University Hospital Santariškiu Klinikos, Vilnius, Lithuania; ³Centre of Radiology and Nuclear Medicine, Vilnius University Hospital Santariškiu Klinikos, Vilnius, Lithuania; ⁴Department of Mathematical Statistics, Vilnius Gediminas Technical University, Vilnius, Lithuania; ⁵Applied Sciences, Vilniaus Kolegija University, Vilnius, Lithuania

Objective: To evaluate prospectively the relationship between radiologic findings and lung function impairment in COPD.

Methods: The data of 38 consecutive patients with COPD were examined. All patients were divided into group I (GOLD I and II, n=20) and group II (GOLD III and IV, n=18) based on post-bronchodilator FEV₁. The patients underwent CT scanning and comprehensive examination of the respiratory function.

Results: The difference of the amounts of pulmonary emphysema, cysts, bronchiectasis, and pneumofibrosis among the patient groups was not statistically significant. Moreover, there were no statistically significant differences of TLC, VC, RV, DLCO indices between groups during disease remission. However, we have observed a significant increase of TLC, RV, and pCO₂ indices, as well as the decrease of DLCO, pO₂, and sO₂ values of group II patients comparing to group I patients during exacerbation of the disease ($p<0.05$).

Presence of bronchiectasis and emphysema had correlation with exacerbations rate ($r = 0.4$, $p<0.05$). Presence of pneumofibrosis correlated with presence of bronchiectasis ($r = 0.4$, $p<0.05$). DLCO had correlation with exacerbations rate and amount of pneumofibrosis ($r = -0.4$, $p<0.05$).

Conclusions: Our study showed that relationship between radiologic findings and lung function impairment in COPD is variegated. Deterioration in DLCO values reflected emerging pneumofibrosis in COPD patients. Repeated exacerbations were associated with bronchiectasis and emphysema. The patients with more severe airflow obstruction (group II) during remission had more severe respiratory function status during exacerbation comparing to group I patients.

Pulmonary functions tests and arterial blood gases in the studied groups

	Group A	Group B	Group C	P-value
FVC	76.3±8.2	84.4±11.3	94.00±7.44	0.001*
FEV1	44.5±3.6	58.1±4.6	103.40±8.18	0.001*
FEV1/FVC	60.5±9.6	67.1±7.5	90.60±4.57	0.001*
PaO2	58±20	63±80	87±90	0.001*
PaCO2	56±90	48±11	37±50	0.001*

*Significant at $p<0.01$.