**0969 Development Process of a New Quality of Life (QoL) Questionnaire Suitable for Patients with Chronic Respiratory Failure**

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Although the St George's Quality of Life recently showed sensitivity to changes in hypercapnic COPD (Meecham-Dones, D. Am J Respir Crit Care Med 1995; 152:38–44), at present there is no QoL questionnaire specific for respiratory failure. We identified 122 items relevant to severe respiratory disease. These were administered to 92 patients affected by COPD (56 males, 19 females) or kyphoscoliosis (5 males, 12 females): 79 were on LTOT; 34 had overnight mechanical ventilation (IPPV). Mean age 65 ± 6 (sd) yrs, FEV1 0.90 ± 0.46 L. They also indicated their perceived overall and respiratory health using two five-point scales. To reduce the number of items, we deleted those influenced by the underlying disease or treatment (Chi squared with Fisher’s exact test p < 0.05), age (Spearman’s rho p < 0.05) or sex (Chi squared with Fisher’s exact test p < 0.05), and those that did not correlate with perceived health (Spearman’s rho p > 0.05). Of the remaining 46 items, 3 were present in two forms (e.g. Getting dressed makes me breathless/ Because of breathlessness I am not dressing myself as I would like to): we chose the form that better correlated with perceived health. Then we removed 10 items with either very low (< 0.20) or very high (> 0.80) response rates. The resulting 33 items were verified for repeatability over 2 weeks: only 24 items remained in the final questionnaire. The repeatability of the 24-item questionnaire was high (r = 0.95). We conclude that this questionnaire is repeatable and irrespective of underlying disease, treatment, age and sex, and correlates well with perceived health.

**0970 Cross-Sectional Analysis of a New Questionnaire for the Quality of Life (QoL) in Chronic Respiratory Failure**

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A 24-item questionnaire specifically designed for severe respiratory diseases was administered to 92 patients (61 males, 31 females) who were receiving LTOT (n = 79) or overnight mechanical ventilation, some via a tracheotomy (n = 13) and others through a nasal mask (n = 21). Their mean age was 65 years (range 39–78), mean FEV1 36% ± 15%; 6-minute walking distance (6-MWD) 269 ± 89 m. The patients also completed the Medical Research Council (MRC) Dyspnoea Scale, a scale for depression (QD), one for anxiety (STAI), the St George’s Respiratory Questionnaire (SGRQ) and the Sickness Impact Profile (SIP). The new questionnaire’s score correlated weakly with some patho-physiological measures, such as FEV1/FVC, 6-MWD, the 6-MWD oxygen flow rate, and the oxygen flow rate prescribed at rest. Conversely, it correlated better with MRC, QD, STAI, SGRQ and SIP scores.

The repeatability of the new questionnaire was measured in 14 patients over 15 days. The r value was 0.95 (95% CI 0.83–0.98) and the coefficient of variation was 15%. We conclude that this questionnaire is a valid and repeatable measure of Impaired health in severe respiratory diseases. Therefore, it could be a useful disease-specific measure of QoL.

**0971 Quality of Life and Hospital Re-Admission in COPD**

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Quality of Life (QOL) in 266 patients admitted to hospital with an exacerbation of COPD, was assessed by St George’s Respiratory Questionnaire (SGRQ) [1]. Information on readmission or death within 12 months, nebuliser provision at discharge and provision of domiciliary oxygen was collected. Mean age of the patients was 69 years. Mean FEV1 was 1.0 SD 0.5, mean FVC 2.1, SD 0.8. Higher (worse) scores on the SGRQ were significantly related to readmission for COPD or death in the next 12 months (Diff % 5% CI Diff 1.8% to 8% p = 0.003). Readmission was not related to gender, age or pulmonary function. 56 patients did not have a home nebuliser before admission. Of these, 14 were provided with a home nebuliser at discharge. Patients provided with nebulisers had significantly worse SGRQ scores (p < 0.001) and worse FVC (p < 0.01). The 41 patients with domiciliary oxygen on admission did not differ in SGRQ or spirometry. Logistic regression analysis of SGRQ subscales showed that the impact subscale of the SGRQ was the best predictor of hospital re-admission and nebuliser provision. Symptom and Activity scores were not significant predictors when Impact scores were controlled for. Women did not differ from men in Symptom scores but differed markedly in Activities and Impact scores.

We conclude that QOL scales which measure patient distress and coping, can predict clinical outcomes independent of physiological measures of disease severity.

**0972 Comparison of Quality of Life in Sarcoidosis and Idiopathic Pulmonary Fibrosis**

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Quality of Life (QoL) in diffuse interstitial lung diseases has not been studied, although they have a chronic debate course. In this study two disease with different natural course, sarcoidosis and IPF were compared.

**Material and method:** We studied 30 patients with sarcoidosis (13M, 17F) aged 23–65 years and 12 with IPF (9M, 3F), aged 41–71 years. The modified Medical Research Council (MRC), the SGRQ or the Oxygen Cost Index (CO2COST), dyspnoea scales, 2) the St George’s Respiratory Questionnaire (SGRQ) 3) the general health questionnaire of well-being (QWB), and 4) the Anxiety and Depression scale (Anx-Dep) were used to access dyspnoea and QoL. In addition, spirometry, lung volumes, diffusion capacity and arterial blood gases (ABGs) were measured.

The results are shown in the table.

**Rehabilitation programmes: Techniques and schedule**

**0973 Dyspnoea During an Incremental Ergometer Test and Respiratory Muscle Load**

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Background: In this study the correlation between dyspnoea and load on the ventilatory muscles was assessed. Both inspiratory and expiratory muscle load were of our interest. This was done in patients with obstructive pulmonary diseases during an incremental maximal exercise test. A subdivision was made between patients with or without a ventilatory exercise limitation. The first was defined as an increase in PaCO2 during exercise.

**Methods:** Fifty patients with a wide range of obstructive pulmonary diseases (FEV1 % pred: 66,1% ± 28.8) performed an incremental cycle ergometer test. During the test dyspnoea (Borg), oxyhemoglobin pressures, mechanical load on the ventilatory muscles (time tension index (TTI)) and minute ventilation were measured. The amplitude of pleural pressures (Pi + PHea) generated at Wmax was multiplied with the breathing frequency (× PIP, indication of the muscle load). PIP% was calculated from: frequency + (PHea + PIPmax)/(PHea + PIPmax) Linear regression between Vt and PIP in Wmax was calculated for both groups. The slopes of these relationships give an impression of the length-tension-inappropriateness. When there was a difference in slope it was assessed whether this led to a difference in Borg score for dyspnoea be-

**Table 1. Correlations (r) and p-values between Borg dyspnoea (BD) and TII, TIIe, PIP, and PIP%, none of the correlations were significant.**

<table>
<thead>
<tr>
<th>BD</th>
<th>TII</th>
<th>TIIe</th>
<th>PIP</th>
<th>PIP%</th>
</tr>
</thead>
<tbody>
<tr>
<td>TII</td>
<td>-0.2272</td>
<td>r = 0.0614</td>
<td>0.1507</td>
<td>r = -0.0013</td>
</tr>
<tr>
<td>TIIe</td>
<td>-0.657</td>
<td>0.0552</td>
<td>0.1922</td>
<td>r = -0.1741</td>
</tr>
<tr>
<td>Nvent, min</td>
<td>-0.3143</td>
<td>r = 0.0819</td>
<td>0.1124</td>
<td>r = -0.1356</td>
</tr>
</tbody>
</table>
tween the two groups. Correlations between the changes in TTI, TTT, PPF, PPFb and Borg dyspnoea for both groups were calculated.

Results: The slope of 

\[ \Delta V_{\text{E}}/P_{\text{F}} \text{PP} \] of the non ventilatory limited group was 0.17 L/kPa (p = 0.007). The slope of 

\[ \Delta V_{\text{E}}/P_{\text{F}} \text{PP} \] for the ventilatory limited group was 0.01 L/kPa (p = 0.7). The difference between the slopes (0.16) was highly significant (c.i. (0.159–0.161)). However there was no difference between the Borg score for dyspnoea between those groups (mean Borg vent. exp. = 5.9 ± 2.1; mean Borg non vent. exp. = 5.9 ± 2.1; p = 0.945). The change in TTI was 0.04 ± 0.03 for the ventilatory limited group and 0.07 ± 0.07 for the non ventilatory limited group, which was not significant. The change in TTT was 0.08 ± 0.08 and 0.06 ± 0.07 for the ventilatory and the non ventilatory limited group respectively and was also not significant.

Conclusions: The reduction of dyspnoea during exercise in patients with obstructive lung disease, did not correlate with parameters of length tension inappropriateness in respiratory muscles. Other parameters of ventilatory muscle load did also not correlate with Borg score for dyspnoea.

0974 Peripheral Muscle Force is Related to Perceived Quality of Life in COPD Patients


Perceived quality of life (QoL) is a multidimensional measure. To evaluate the factors that contribute to QoL in COPD, we evaluated 59 patients, (FEV1 44 ± 15%) selected for pulmonary rehabilitation. Pulmonary function, respiratory muscle strength, peripheral muscle strength, exercise capacity and QoL, as assessed by the Chronic Respiratory Disease Questionnaire (CRDQ), were measured. Until now no patients completed the CRDQ, the QoL and peripheral muscle force in COPD patients. Moreover, changes in peripheral muscle force is the only factor significantly correlated to altered QoL. Consequently, peripheral muscle training may be an important tool in improving QoL in COPD patients. Supported by the National Fonds voor Wetenschappelijk Onderzoek, Arctic Leventijn, grant ±00.002 94.

0975 Change in Lower Limb Muscle Strength Contributes to Altered Six Minute Walking Distance in COPD T. Troosters, R. Gosselink, H. Röllner, M. Decramer. University Hospitals, Respiratory Rehabilitation and Respiratory Division, Katholieke Universiteit Leuven B-3000 Leuven, Belgium. Faculty of Physical Education and Physiotherapy, Katholieke Universiteit Leuven B-3000 Leuven, Belgium.

It has been shown previously that peripheral muscle weakness is related to exercise intolerance in COPD (Gosselink et al Eur Respir J 1995: 8: 127s). Causality of this relationship was examined by performing 3 month follow-up measurements in 17 patients (FEV1 46 ± 14%) receiving optimal medical treatment only, Pulmonary function, quadriceps force (QF), handgrip force (HF), inspiratory muscle strength (PImax), 6 minute walking test (6 MWD), and maximal cycle ergometry (Wmax, VO2max). Six patients were operated three month follow up period. After randomization 14 of these patients received medical treatment only and 18 were included in a rehabilitation program. Single correlation analysis was performed on the initial data and on the changes after three months. At the initial testing, only Massey strength correlated significantly (QF: p < 0.01). Massey force, PImax and HF explained 83% (p < 0.01), Massey force (r = 0.37 p < 0.01) and Emotion (r = 0.25 p < 0.05) as well as the total score on the CRDQ (r = 0.32 p < 0.05) correlated significantly with initial quadriceps force (QF). Changes (Δ) in QoL were not correlated with Δ QF, but correlated significantly with Δ QF (see Table 1). No correlation was detected with other variables.

Table 1: Single correlation coefficients between QoL versus dimensions in QoL of the CRDQ

<table>
<thead>
<tr>
<th>ΔQF</th>
<th>ΔMassey</th>
<th>ΔEmotion</th>
<th>ΔFatigue</th>
<th>ΔTotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.38*</td>
<td>0.39**</td>
<td>0.40**</td>
<td>0.40**</td>
<td></td>
</tr>
</tbody>
</table>

* p = 0.05, ** p = 0.01, \( \hat{p} = 0.07 \).

In conclusion, perceived quality of life appears to be linked with peripheral muscle force in COPD patients. Moreover, changes in peripheral muscle force is the only factor significantly correlated to altered QoL. Consequently, peripheral muscle training may be an important tool in improving QoL in COPD patients. Supported by the National Fonds voor Wetenschappelijk Onderzoek, Arctic Leventijn, grant #00.002 94.


Objective: Comparing combined upper and lower limbs (Group I) vs lower limbs (Group II) training in severe COPD patients.

Material and methods: From June 1993 to March 1995, 28 stable COPD patients were randomized in 2 groups: 14 patients (Group I) with combined training; (Mean and median age 63.1 (9.4) years, FEV1 (L) 0.43 (0.38), FEV1/FVC 0.46 (0.16), DlCO (ml/mmHg/min) 18.2 (5.1), BMI (kg/m2) 24.7 (4.6); and 14 patients (Group II) with lower limbs training; Age 66.1 (0.2), FEV1 1.08 (0.38), FEV1/FVC 0.42 (0.14), DlCO 16.5 (6.3), BMI 23.3 (4.5).

All patients performed, before and after training, a maximal incremental exercise test with VO2 determination and endurance tests for lower limbs (12WT) and upper limbs (6UL1). Both groups were trained above 75% of initial maximal load, during 8 weeks. Group I underwent non supported upper limbs + lower limbs (6UL1).

Results:

Group I | PRE | POST | p
--- | --- | --- | ---
PImax (cmH20) | 71 (16) | 75 (15) | 0.007
PImax (mmHg) | 92 (28) | 93 (28) | 0.0001
6MWT (m) | 706 (218) | 75 (16) | 0.0001

The slope of V\(E\)/P\(F\) for the ventilatory limited group was 0.01 L/kPa and Borg dyspnoea for both groups were calculated.

This supports the idea that quadriceps force is causally related to 6 MWD. Efforts in rehabilitation of COPD should be directed towards improvement of lower limb muscle force in order to improve functional exercise capacity.

Peripheral Muscle Force in COPD patients. Moreover, change in peripheral muscle force is the only factor significantly correlated to altered QoL. Consequently, peripheral muscle training may be an important tool in improving QoL in COPD patients. Supported by the National Fonds voor Wetenschappelijk Onderzoek, Arctic Leventijn, grant #00.002 94.