Factors associated with the mental and physical health-related quality of life of asthma patients: a cross-sectional analysis
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Asthma is one of the most common chronic diseases that affects an estimated 300 million individuals worldwide. Provided that their asthma disease is properly treated, many patients can achieve a good asthma control (moderate asthma symptoms or even absence of asthma symptoms) and a substantial improvement of their health-related quality of life (HRQoL)1,2. The aim of this study is to assess the real-life HRQoL of asthma patients in Germany and to identify factors that may be associated with this HRQoL, including any deficiencies with regard to asthma control.

Methods

Data were collected in an ongoing prospective observational study of German asthma patients from 2015 onwards. At time of study inclusion, treating physicians documented patient's sociodemographics as well as health-related data for the included patients. In addition, patients were asked to complete a written questionnaire including Asthma Control Test (ACT™)3 and the SF-36 questionnaire. Both questionnaires have been frequently used to measure asthma control and HRQoL of asthma patients4,5. In the prospective part of the study, additional clinical data as well as data collected in phone surveys will be collected; however, these data are not presented in this paper. In this analysis, we used those data that have been collected at inclusion date of the patients.

Specifically, we analyzed data collected based on written SF-36 questionnaires. Analysis of data was done according to the SF-36 user manual6, subscale values as well as physical and mental scores were calculated for every patient. Internal consistency was measured through Cronbach’s α. Predictors of mental as well as physical HRQoL scale values were estimated in two multivariate linear regression models. Independent variables that did not reach statistical significance (p>0.1) were excluded from the models through backward elimination. Nested regression models were used to test the significance of adding specific predictors to the models and to demonstrate relevance of every variable on the model fit.

Background and Objectives

Patients characteristics

In total, 641 patients were included who answered all items of the SF-36 at date of study inclusion; patients were included by both specialists and GPs. Mean age of patients is 52.51 years with 74.1% of the patients being female (Table 1). Based on patient’s responses to the ACT™, 11.9% have well controlled asthma, 43.7% partly controlled and 44.3% uncontrolled asthma.

HRQoL

Results

The eight SF-36 subscales as well as the sum scales of physical and mental quality of life are shown in Figure 1. The highest mean score can be seen for the subscale of social functioning with a score value of 8.66 out of 100. Physical functioning (74.6), body pain (73.1), mental health (70.9), emotional role (69.4) and physical role (67.8) reach lower values, whereas vitality (59.1) and general health perceptions (59.1) reach the lowest score values. The internal consistency of the eight subscales is high (Cronbach’s α=0.905). Mean physical sum scale is 45.9 (SD 9.9) and mean mental scale 48.7 (SD 11.5). Mental quality of life has a bigger variance, with an Interquartile range (IQR) of 40.4 to 57.6, compared to the influence on the physical scale (IQR 39.1 – 54.0). It is notable that more than 50% of all patients have a mental scale of >50 median: 52.5).

Predicting factors for SF-36 HRQoL

Table 2 shows the results of the multivariate linear estimates for the physical sum scale of SF-36, which is found to be significantly lower in older patients (p<0.001), females (p=0.019) and patients with additional comorbidities (p<0.009). The mean physical HRQoL of asthma patients who are in need of help was 6.2 points lower compared to those who do not need any help (p=0.002). Irregular sport activities are associated with a lower score of -2.10 on average, compared to patients who do sports at least once a week (p=0.017). A highly statistically significant association is also found between the level of asthma control and the physical quality of life (p=0.001). Compared to uncontrolled patients, partly controlled patients reach an mean score of +4.86, and well controlled patients of +8.74. Nested models show that age and level of asthma control have the highest impact on the physical quality of life. The explanatory power of the model reaches an overall adjusted R² of 0.3193, which shows that about 32% of the physical HRQoL can be explained by the Included independent variables. For the mental HRQoL (Table 3 and Figure 3), fewer variables tempt out to have a significant influence. Consequently, the multivariate regression model only reaches an adjusted R² of 0.1083. Gender (p=0.002), level of asthma control (p=0.001), and the asthma form (allergic asthma associated with the lowest HRQoL, p<0.028/0.038) are found to have a significant influence. Coefficients for the influence of the level of asthma control are comparable to those in the regression model for physical health components. In total, the level of asthma control has the highest predictive power for mental HRQoL components (Figure 3).

Discussion

We analyzed the HRQoL as measured by the SF-36 for 641 asthma patients with a mean age of 52.21 years (74% being female). The highest SF-36 HRQoL score values are found for physical functioning subsdomains, vitality and general health perceptions show the lowest values.

References