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Compliance Indicators in Geriatric Patients with Chronic Obstructive Pulmonary Disease

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Abstract

Background and objectives: Chronic obstructive pulmonary disease (COPD) is rated among the world's most common respiratory pathologies. One of the relevant issues in the contemporary healthcare is the chronic patient's resistance to duly follow the doctor's instruction. The aim of this study is to evaluate treatment compliance among elderly patients with COPD.

Methods: The survey involved 95 elderly patients from the Pulmonary Department with exacerbated COPD, whereas specialized Morisky-Green medication adherence test was used, and an interview with a reviewed patient compliance questionnaire.

Results: 57.9% of the patients tended to cooperate, while 42.1% of the patient body revealed lower motivation for this. The average patient compliance score was 2.44 ± 0.16. The share of non-compliant men (61.4%) was 2.4 times as high as that of women (25.5%). Differences in compliance were identified depending on the academic background – 75.0% of patients with secondary education were compliant; of those with a special vocational degree – 63.5%, while only 50% of those with a university degree revealed such an attitude. 73.3% of compliant patients with a university degree had insufficient compliance; of those with special vocational degree – 57.6%; as for those with a secondary training degree, this rate was 100%. Treatment adherence among smoking male patients was 1.6 times as low compared with their non-smoking counterparts. Patients most often explained skipping medication with forgetfulness (37.9% of cases), lack of care towards themselves (22.1%), fear of poisoning the body and need to get some "rest" from treatment (14.7%).

Conclusion: A significantly higher compliance level was found in women; treatment adherence among non-smoking men exceeded that among men with nicotine dependency. Compliance rates were optimal among people with special vocational training. The willingness to cooperate in groups with various degrees of COPD increased along with the pathology severity.

Keywords: COPD; Elderly patients; Medication adherence

Introduction

Chronic obstructive pulmonary disease (COPD) is one of the most common chronic respiratory diseases worldwide [1]. The major area of treatment offered to such patients lies within pharmacotherapy [2,3]. The multicenter studies carried out so far prove newer drugs to be efficient in treating bronchial obstructive diseases, which (along with the presence of comorbid diseases) sometimes raises the need for simultaneous administration of not just 1 or 2 medicines yet 4 and even more of them [4]. This often results in various issues that patients and their doctors have to face (including issues based on the type of psychological stress). Patients' reluctance to follow the doctor's instructions in full while treating chronic diseases is considered to be one of significant issues in the contemporary healthcare system [5,6]. The degree of the patient's willingness to cooperate with medical staff through the course of medication treatment (the match between the prescribed drugs and those taken actually) or the match between the patient's behavior and the recommendations from the doctor is usually called "compliance" or "adherence to treatment".

Patients' compliance is subject to numerous factors where the leading ones include the convenience of taking the drug; the patients' concern about their own disease; the contact between the doctor and the patient; trust in medicine in general and in treatment in particular; certain potential benefits obtained through the patient status; various mental issues [7,8]. There is evidence revealing a link between a lower level of treatment adherence and the elderly and senile age in patients [8]. Low treatment adherence is the major reason behind a therapeutic effect decrease; it also increases significantly the likelihood of developing complications, as well as leads to a decrease in the patient's life quality and an increase in the treatment cost [6]. And, respectively, there is a negative correlation between the compliance levels and the overall mortality [9]. Many patient compliance studies focus on cardiovascular issues [5]. As for studies investigating the compliance of patients with chronic lung pathology, they are few. The purpose of this study was to evaluate the treatment adherence among patients with COPD under normal living conditions (outside the in-patient setting).

Methods

A questionnaire test was carried out at the local Pulmonology Department among patients with exacerbated COPD, whereas indirect survey method and the Russian version of the specialized Morisky-Green MMAS-4 medication adherence questionnaire was used [10]. Subject to the MMAS-4 evaluation criteria, the patients who scored 4 were considered compliant while those scoring under 3–non-compliant.

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The respondents scoring 3 were viewed as insufficiently compliant and at risk of developing non-compliance [10]. Besides, interviews were carried out using a compliance evaluation questionnaire adjusted for pulmonology pathologies [5,11]. The diagnoses and ongoing treatment at the time were identified based on the medical records (Inpatient's Card).

Statistical analysis

The statistical data processing was performed employing the standard package of SPSS 21.0 application programs for Windows. The qualitative variables were described in absolute and relative (%) frequencies, while the arithmetic mean and standard error of the mean (M ± m) were determined for the quantitative variables. When comparing the two groups with a normal type of data distribution, the t-test with the Bonferroni correction was used, whereas for distributions different from the normal, the χ^2 criterion was used. The Wilcoxon criterion was applied to assess the reliability of quantitative data differences in related samples. For all the types of analysis, the statistically significant difference was set at $p < 0.05$.

Patient characteristics

95 patients with COPD (age–60–87) were examined through the study in Table 1, of which 46.3% were men and 53.7%–women. The mean age was 65.3 ± 4.5; for men – 66.6 ± 2.3, for women–64.3 ± 3.7. The duration of the illness was 10.4 ± 2.3 years. Prevailing (more than 80%) were patients with severe bronchial obstructive pathology and with moderate severity of the disease (Figure 1). The structure of the pathology, given its severity, corresponded to that of all COPD patients in the Pulmonology Department. A part of elderly patients with COPD (7.4%) had a combination of the disease in question with bronchial asthma of moderate and severe degree, which had a significant impact on the clinical picture of the underlying disease and required correction of diagnostic and therapeutic approaches. Most often COPD was combined with cardiovascular diseases–ischemic heart disease (effort angina, functional class II-III; post-infarction cardiosclerosis; heart rhythm disturbances), hypertensive disease II-III stage; myocardiodystrophies. Symptoms of chronic pulmonary heart disease were observed in 61.1% of the patients: 38.9% of them
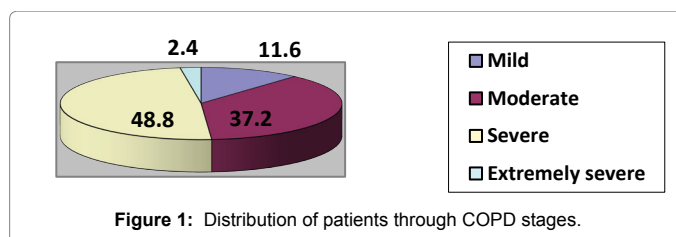

Figure 1: Distribution of patients through COPD stages.

had symptoms of compensated, with another 22.2% decompensated pulmonary heart.

29.4% of the respondents were smokers. According to the questionnaire data, only men abused smoking–in their group this value was 63.6% (prevalence of smoking among all the respondents 29.5%). The patients interviewed in outpatient settings were most often followed by a pulmonary specialist (53.7%) and by a local neighborhood physician (26.3%), while the rest of the respondents were taken care of by general practitioners. 40% of patients visited the respective neighborhood polyclinics regularly once in 3 months; 26.3% came for follow up appointments once in six months, and 33.7% of the patients contacted their doctors sporadically. Following the regional standard requirements, patients received treatment, which typically included bronchodilator and anti-inflammatory drugs. In case of bacterial exacerbation, patients were administered antibacterial drugs according to the sensitivity of the microflora, which was determined through a bacteriological study. At the inpatient stage of treatment, up to 6 drugs could be used simultaneously.

Results

The patients believed that they needed hospitalization primarily to treat the disease exacerbation (63.2%), to select and correct the treatment (18.9%), as well as to evaluate their health status prior to being re-examined at the bodies of medical and social evaluation (10.5%) and to prevent deterioration (7.4%). All the respondents believed that getting treatment while hospitalized was more important and effective in terms of maintaining a stable course of the disease and reducing its progression, if compared to treatment obtained out patiently. This might be due to the fact that hospitals offer fairly consistent and strict control from the medical staff monitoring the patients' following the doctors' respective instructions; besides there is also informal mutual control from patients themselves. However, given the short stay in hospital, the outpatient stage of the treatment for chronic diseases proves the most significant part. During that, interviewing the respondents revealed that recommendations coming from doctors of a specialized pulmonary hospital were taken by the patients more seriously if compared to recommendations from general practitioners of outpatient clinics. Another phenomenon identified among the respondents was an equally flat preference of infusion, first of all, drip type of introducing the medicine, in spite of the fact that this ensures only short-term drug circulation in the body.

The patients also manifested a tendency for polytherapy and polypharmacy 84.2% of the patients on their outpatient stage received more than 3 medicines daily with only 15.8% of the respondents using 1-2 drugs. Most often the long-term prescribed drugs for COPD patients were those belonging to the beta-adrenergic agonists (50.5%), less often from the m-anticholinergics and phosphodiesterase inhibitors (18.9% each). At the bottom of this list were inhaled glucocorticosteroids (11.7%). In addition, many patients were taking drugs to treat cardiovascular issues and complications. 68.4% of the

Indicator	Compliant patients		Non-compliant patients		Total	
	n	%	n	%	n	%
Age of 60 and older	55	57.9	40	42.1	95	100
Gender Male Female	17 38	38.6 74.5*	27 13	61.4 25.5*	44 51	46.3 53.7
Academic background Higher Special vocational Secondary Illiterate	15 33 9 0	50** 63.5 75 0	15 19 3 1	50 36.5 25 100	30 52 12 1	31.6 54.7 12.6 1.1
Smoking (males) Yes No	11 10	39.3 62.5***	17 6	60.7 37.5	28 16	100 100
Tending to cooperate	55	57.9	40	42.1	95	100

*Statistically significant difference compared to the male group.
**Statistically significant difference compared to groups of persons with secondary or special vocational academic background.
***Statistically significant difference compared to the smoking group (for all cases, no lower than p<0.05).
Table 1: Social and demographic features of the patients with COPD involved in the study.

patients never rejected taking medication because of side effects; 31.6% of the patients discontinued that with a varying frequency (3.2% of all the respondents always did so). 44.2% of the patients never stopped medication intake even after their condition improved, while 55.8% of the patients offered an alternative response here. 51.6% claimed to never forget to take medications, while 48.4% of the patients admitted they did it. Most often the patients (over 60% of the respondents) associated skipping medication intake with forgetfulness and lack of careful attitude towards themselves (Table 2).

According to the MMAS-4 questionnaire, 57.9% of the patients are generally committed to cooperation with the doctor with another 42.1% revealing low motivation. The average adherence score was 2.44 ± 0.16. For men, it was at 2.12 points being 30% higher among women (2.75, $p < 0.05$). It should be noted that only 29.1% out of the motivated patients met fully the criteria for compliance, whereas 70.9% were evaluated as not properly compliant. Matching the data on treatment adherence with the patient distribution based on the disease severity, it can be noted that the proportion of noncompliant patients with a mild respiratory pathology is 1.7 times as high, and with a moderate pathology–1.4 times as high, as in case of severe course. Respectively, the proportion of patients tending to cooperate with medical personnel in case of severe COPD is 1.5 times as high as in mild cases and 1.2 times as high as in cases with moderate severity ($p < 0.05$). At the same time, the proportion of fully compliant patients basically revealed no difference along with a change in the severity of the course of the disease from mild to severe (21.4%-18.8%-21.7%, $p > 0.05$). A similar trend was observed when comparing the proportion of patients with insufficient compliance (respectively, from mild to severe COPD, 78.6%-81.2% - 78.3%, $p > 0.05$). Complaint behavior was declared only by respondents with extremely serious pathologies.

Differences in treatment adherence were noted depending on the level of academic background: of those with secondary education, 75% of the patients were compliant; those with special vocational training revealed compliance in 63.5% of cases, while only 50% of the patients with a higher academic degree were compliant ($p < 0.05$). In addition, it is interesting that 73.3% of the adherent patients with a higher education degree had insufficient compliance; for those with special vocational training this value was 57.6%, and 100% of cases with a secondary degree were compliant ($p < 0.05$). Assumption can be made that this kind of paradox may by accounted for, first of all, by greater inclination of better educated patients to analyze the contents of the leaflets supplied along with medicines, as well as data from other available sources (the Internet), including information on possible side effects entailed by the respective drugs, and, subsequently, by attempts to avoid potential occurrence given the background of the existing concomitant (mainly cardiovascular) pathology. In general, the highest percentage of compliant patients (scoring 4 points) among patients with special vocational training (1.6 times as high as in cases with a higher academic degree) is probably related to the optimal

ratio of academic training and obedience in this group of patients. Adherence to treatment among smoking men (39.3%) was 1.6 times as low as that in the non-smoking group (62.5%, $p < 0.05$). Actually, continued tobacco smoking against the recommendations from medical personnel can also be considered as respective patients' lack of adherence to treating COPD. There are significant gender differences in the obtained indicators: 74.5% of women are treatment adherent, while among men this figure is only 38.6% ($p < 0.05$), so the proportion of male patients not prone to cooperating with medical staff in matters of pharmacotherapy is 1.9 times as high.

Discussion

The above data suggests that the majority of patients with COPD place declaratively the emphasis on the prevention of worsening through the course of bronchial obstructive pathology, often neglecting possible side effects from taking the medicines prescribed. Analysis of the reasons behind skipping medication indicates that, given the apparent diversity, all of such reasons can be ultimately boiled down to insufficient explanatory work that physicians carry out with patients, given a wide variety of drugs available on the Russian pharmaceutical market for treating COPD, while such drugs, even though bearing different names, yet have similar or even identical chemical composition.

The high prevalence of the leading risk factor for COPD–smoking– among the male respondents (including those who are part of the compliant group) definitely does not match the spirit of collaboration between patients and medical personnel [12]. The differences and coincidences noted in terms of compliance, when compared with ambiguous evidence offered by other authors, may probably be related to the difference in the groups involved in the study as well as to the use of different research tool [13,14]. Given that the main reason for the low compliance of the majority of the respondent-patients with COPD was forgetfulness, it can be assumed that increasing motivation for treatment will depend on effort applied to solving this respective issue (using, first of all by men, various diaries bearing some visual data, gadgets, and computer software/applications for mobile phones, as well as special marking on respective drug packaging reminding of the medication administered). Another promising approach could imply using smaller boxes that would contain daily dosages of the prescribed medicines, and which patients could have in their pockets. Doctors, however, should not abandon the tactics of selecting effective (including combined) affordable medications with a minimum of 24-hour intake rates, and offering training to patients in special COPD schools in order to establish a doctor-patient partnership and subsequent regular monitoring of the patient performance. A potentially promising point here is that economic issues were not cited as of any serious importance, while distrust to the doctor and the frequency of medication intake were never mentioned at all. In view of the above-mentioned, a number of cases require identifying situations (eg, sudden acute exacerbation of bronchial obstructive syndrome) where patients could decide independently on changing the drug dosage within a predetermined range.

Conclusion

Our study showed that talking of patients with COPD, significantly higher compliance is typical of women if compared to men; besides, the treatment adherence among nonsmokers exceeded that in the group of those with nicotine dependency. Compliance rates were the highest among those with special vocational education. The tendency to cooperate in groups with varying degrees of COPD severity went

Reason	Rate, %
Forgetfulness	37.9
Lack of care of oneself	22.1
Fear of poisoning body and need for getting some "rest" from treatment	14.7
Side-effects	8.4
Administration of too many medicines	8.4
Fear of addiction	5.3
Lack of means to purchase all the medicines prescribed	3.2

Table 2: Top reasons mentioned in questionnaires for skipping medicine.

up along with the severity of the pathology. The presence of a large reserve body of insufficiently compliant patients among those prone to cooperate, confirms the importance of training patients with COPD teaching them how to achieve controlled self-management.

Disclosure

The authors report no conflicts of interest in this work.

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