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Difficulties experienced by geriatric patients regarding respiratory devices and access to health services: A cross-sectional study

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Abstract

Background/Aim: In the treatment of chronic respiratory failure, long-term oxygen therapy at home (LTOT) and domiciliary noninvasive mechanical ventilation (NIV) are important components of home care. The aim was to evaluate the compliance of geriatric patients with LTOT/NIV at home and their access to health services in the last year.

Methods: Screening of 669 patients who were hospitalized in our pulmonary intensive care unit between 30.09.2019 and 30.09.2020 revealed a total of 109 patients over 80 years of age with chronic respiratory failure. Among them, 70 died after discharge. Six of the 39 surviving cases were excluded from the study because they were discharged without any LTOT and/or NIV devices, and the COVID-19 PCR tests of 4 patients were positive after discharge. The remaining 29 patients over 80 years of age were enrolled in the study. After questioning the patient's care status, caregivers were asked whether the patients were compliant with NIV and/or LTOT devices at home and their usage in terms of hours during the day and nighttime. In non-compliant patients, the reasons were acquired, and the answers were noted. They were asked whether they gave up on healthcare services and scheduled check-ups, had difficulties in getting a doctor's appointment, and whether they were incompliant with the appointments they made. If the answers were yes, they asked about their reasons for each question.

Results: The median age was 85 (80-96) years, and 65.5% (n=19) of the cases were female. The diagnosis which led to hospitalization in 86.2% (n=25) of the patients was hypercapnic respiratory failure. Fifteen patients (51.7%) with LTOT and 9 patients (81.8%) with NIV did not use their devices as recommended. The patients' caregivers expressed that 22 patients (75.8%) could not meet their basic needs and 17 patients (77.2%) did not receive home care services provided by the Ministry of Health. Although the need arose in the post-discharge period, it was observed that 24 patients (82.7%) were not taken to the doctor and 20 patients (68.9%) did not schedule doctor visits after discharge. All caregivers stated that they were afraid of the COVID-19 pandemic and catching the COVID-19 disease from the emergency rooms and outpatient clinics.

Conclusions: Our patients' compliance with the LTOT device was poor and 51.7% of the patients used the device less than recommended. Moreover, the patients were mostly incompliant with domiciliary NIV treatment. Receiving nonspecific home care services did not have any effect on LTOT and/or NIV compliance. It was observed that disruption in doctor visits and patient admissions leads to the decreased compliance with LTOT and/or NIV devices and loss of motivation to use these devices. The cases in this study avoided all kinds of admissions to the hospital due to the COVID-19 pandemic. In such conditions, structured and specific home care services for geriatric respiratory failure patients become more important. Continuing education and motivation at home will increase the quality of life of the patients and improve compliance.

Keywords: Long-term oxygen therapy, Domiciliary noninvasive mechanical ventilation, Very elderly, Geriatric patients, Compliance, Home care

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Introduction

In the treatment of chronic respiratory failure, domiciliary long-term oxygen support (LTOT) and noninvasive mechanical ventilation (NIV) are important components of home care. The use of LTOT/NIV has increased in the last 20-30 years [1].

Domiciliary NIV is used in the treatment of chronic diseases such as chronic obstructive pulmonary disease (COPD), obesity hypoventilation syndrome, neuromuscular diseases, and restrictive chest wall disorders [2]. In a study from Turkey, NIV's main indications were COPD (75%), OHS (10%) of COPD and OHS overlap (10%), and restrictive lung disorders (5%) [3].

Age has not been reported as a criterion in indications for use of NIV at home. Available data show that the NIV usage rate increases in the elderly population (74-85 years and ≥85 years). The decline in respiratory reserve and comorbidities due to aging, and very advanced age resulted in a decrease in quality of life, as well as an increase in hospital admissions and healthcare costs [1].

The efficacy, safety, and benefits of domiciliary LTOT and NIV have been demonstrated in elderly patients. However, in the same patient group, difficulty in compliance with treatment and treatment failure were also emphasized [4-7].

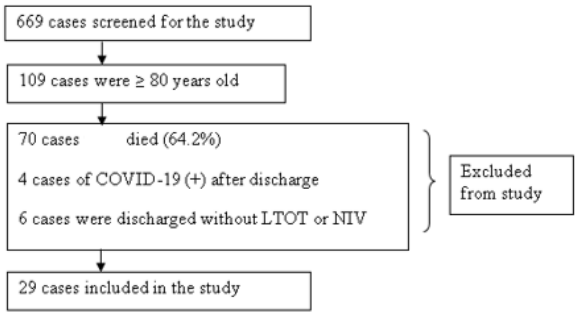
In this context, compliance of patients aged 80 years and over with LTOT/NIV was evaluated with a remote interview in patients who were treated in our pulmonary intensive care unit. It was noted whether these elderly patients had difficulties in accessing health services due to pandemic conditions within the last year.

Materials and methods

A total of 669 patients were hospitalized in our pulmonary intensive care unit of tertiary chest diseases hospital between 30.09.2019 and 30.09.2020. A total of 109 patients over 80 years old were identified. COVID-19 PCR positivity or suspicion was excluded in all 109 patients before hospitalization to our pulmonary intensive care unit (ICU). It was seen that 70 of 109 patients died after discharge. Six of the 39 surviving cases were excluded from the study because they were discharged without any LTOT and/or NIV devices, and 4 cases were found to be COVID-19 positive after discharge. During hospitalization, all patients were routinely asked for permission to use their anonymous medical data for clinical studies, and twenty-nine cases who gave their consent were included in the study (Figure 1). After retrospective data were collected, the caregivers of all cases were interviewed, and their verbal consents were obtained. For open-ended questions, their own words were recorded on the registration form without any bias. Retrospective analyses require no ethics board approval; however, our study was approved by the Ethics Board of Atatürk Chest Diseases and Chest Surgery Training and Research Hospital (Date: 07.01.2021, Number: 708)

The patients' compliance with the LTOT and/or NIV devices were questioned after three months following discharge from the hospital. The study was conducted in January 2021. After questioning the patient's care status, caregivers were asked six closed and six open-ended questions based on their answers. They were asked whether they used the NIV and/or LTOT device at home, and for how many hours during the day and night, whether they gave up on healthcare services and scheduled check-ups, had difficulties in getting a doctor's appointment, and whether they were incompliant with the appointments they made. If the answers were yes, they asked about their reasons for each question. The responses of the caregiver to the open-ended questions were recorded word for word. At the end of the interview, patients are invited for a control examination.

Figure 1: Flow-diagram



Statistical analysis

Statistical analyses were performed with SPSS version 22. Categorical data were presented as number and percentage, non-normally distributed ordinal or numerical data were given as median, min and max values, and normally distributed numerical data, as mean (SD). Categorical data were evaluated with Chi-square or Fisher tests, and numerical data were assessed with Student t-test or Mann-Whitney U test. A value of $P<0.05$ was considered statistically significant.

Results

This study consisted of geriatric patients who were hospitalized in a tertiary chest diseases training and research hospital. Four of twenty-nine patients had a history of intubation-extubation, and a total of twenty-one patients were transferred from the anesthesia intensive care unit to our intensive care unit. In our intensive care unit, the mean duration of hospitalization was 10.9 (6.3) days. After their treatment and LTOT and/or NIV device training, 28 patients were discharged directly to their home, and one case was transferred to an inpatient service and discharged later.

The median age was 85 (80-96) years, 65.5% (n=19) of the cases were female and 58.6% (n=17) were illiterate. Demographic data are shown in Table 1. Before hospitalization, 19 patients had LTOT devices, and 5 patients had NIV devices at home. LTOT device was prescribed to 10 patients and NIV device was prescribed to 6 patients according to social security institution reimbursement conditions, and their use was reevaluated for indications at discharge. The patient's own and newly prescribed devices were routinely brought to our clinic by caregivers or relatives. A routine follow-up was made with their own devices for 24 hours before discharge. Device training was repeated and recorded for caregivers and patients during their stay. Necessary training was repeated during the last follow-up day. Once stable, the patients were discharged with their own devices.

The diagnosis which led to hospitalization was hypercapnic respiratory failure in 86.2% (n=25) and COPD in 82.8% (n=24). Diabetes mellitus (31%) and congestive heart failure (41.4%) were the most common comorbidities. Four or more comorbidities were observed in 86.2% of all patients (Table 2).

Table 1: Demographic and basic characteristics

Characteristics	n (%)
Age median (min-max)	85 (80-96)
Gender	
Male	10 (34.5)
Female	19 (65.5)
Education status	
Illiterate	17 (58.6)
Literate	5 (17.2)
Primary school	4 (13.8)
Middle School	1 (3.4)
High school	2 (6.9)
College	0 (0)
Need for home care	
Yes	22 (75.9)
No	7 (24.1)
Receiving home care service	
Taking	5 (17.2)
Not receiving	24 (82.8)
Caregiver	
First-degree relative	21 (95.5)
Professional caregiver	1 (4.5)
The clinic where they came from	
Emergency	7 (24.1)
Inpatient clinics	1 (3.4)
Level 3 intensive care unit	21 (72.4)
Place of discharge	
Home	28 (96.6)
Inpatient clinics	1 (3.4)

Table 2: Comorbidity status

Comorbidity	n (%)
Hypercapnic respiratory failure	25 (86.2)
Chronic obstructive pulmonary disease	24 (82.8)
Hypertension	20 (69.0)
Congestive heart failure	12 (41.4)
Diabetes mellitus	9 (31.0)
Coronary artery disease	4 (13.8)
Hypoxic respiratory failure	3 (10.3)
Heart rhythm disorder	3 (10.3)
Alzheimer	3 (10.3)
Chronic renal failure	3 (10.3)
Cancer	2 (6.9)
Hyperthyroid	1 (3.4)
Parkinson	1 (3.4)
Comorbidity number	
3 and less	4 (13.8)
4 and more	25 (86.2)

The caregivers expressed that twenty-two patients (75.8%) could not meet their basic needs (eating, drinking, using drugs, using LTOT and/or NIV, and toilet needs on their own). The caregivers of twenty-one of these twenty-two cases were first-degree relatives. Seventeen (77.2%) of twenty-two patients did not receive home care services provided by the Ministry of Health.

It was observed that the number of patients who applied for the control examination planned after discharge was only three. Twenty-six patients had not applied for recommended and planned follow-up examinations after discharge.

All patients (n=29) had an LTOT devices, and 11 patients had NIV devices at home. Fifteen patients (51.7%) with LTOT and 9 patients (81.8%) with NIV did not use their devices as recommended; they were considered non-compliant (Table 3).

Table 3: Treatment compliance status

	Compliant n (%)	Non-compliant n (%)
Long-term oxygen therapy	14 (48.3)	15 (51.7)
Noninvasive mechanical ventilation	2 (18.1)	9 (81.9)

After questioning their compliance with LTOT and/or NIV and care status, caregivers were asked six closed and six open-ended questions, and their answers were evaluated. Although the need arose in the post-discharge period, it was observed that twenty-four patients (82.7%) were not taken to the doctor. When asked about the reason without any inducements, all caregivers stated that they were afraid of the coronavirus disease-19 (COVID-19) pandemic and catching the COVID-19 disease in emergency rooms and outpatient clinics. Twenty patients (68.9%) who did not come for planned doctor check-ups after discharge stated the same reasons.

Discussion

Out of 109 patients hospitalized in the second-level chest diseases intensive care unit within the specified 1-year period, twenty-nine patients who met the inclusion criteria comprised the study group.

The mortality rate among those aged 80 years and over within the last 15 months was 64.2% (n=70), regardless of whether they died in or out of the hospital. These cases were excluded from the study due to the design, and no further analysis was performed. However, this result is quite surprising and constitutes important data for further studies on survival after respiratory intensive care unit admission in the elderly/geriatric group. Cirik et al. [8] reported that the 30-day mortality rate was 46% in the geriatric patient group in the third level anesthesia intensive care unit.

In this sample group, we found that only 5 of 22 patients received regular home care services, despite being in need. Respiratory diseases negatively affect the quality of life of individuals with their life-long treatment and symptoms. They change patients' lifestyles and require home care after discharge from the hospital. The purpose of home care in respiratory system diseases is preventing the progression of the disease and decline in functions, reducing symptoms and complications, preventing and/or treating recurrent acute attacks, protecting respiratory functions, increasing exercise capacity, and protecting and increasing the quality of life [9].

In a study conducted in Canada in 2015, it was found that the home care needs of slightly more than one-third of adults in the community are not met [10]. The home care system offers a wide variety of services designed to help geriatric patients improve their symptoms and functionality, and manage their illness [11, 12]. Home care can reduce hospital costs [13]. Studies suggest that home care services are more cost-effective than outpatient services [7]. Almost all caregivers of the patients in our study were first-degree relatives. Studies show that caregiving imposes significant physical, psychological, and financial burden on caregivers [14].

Home care services are extremely useful when elderly patients have difficulties in access to health services such as under pandemic conditions, socioeconomic deficiencies, burnout of caregivers, or diseases that cause immobilization. It has been reported that home care in respiratory patients reduces 1-year mortality, increases the health-related quality of life, decreases admission to hospital and emergency services, and decreases complications associated with recurrent hospitalizations [7].

NIV is an effective treatment for the elderly. It has been shown that NIV reduces the intubation and mortality rates in very elderly patients with acute hypercapnic respiratory failure [6]. It improves arterial blood gases and nocturnal desaturations, reduces hospitalizations, and is associated with long-term survival. Therefore, elder age should not be considered an exclusion criterion for prescribing NIV. It has been reported that NIV compliance is good in the elderly and they have similar usage rates with other age groups [4,5]. However, in this study, it was found that patients who must use NIV treatment at home were mostly non-compliant. Receiving nonspecific home care service did not have any effect on NIV compliance.

Studies have shown that LTOT treatment has a survival benefit in COPD and chronic hypoxemia. However, when 30-60%

of the patients with LTOT indication at the beginning were checked 1-3 months later, the indication had disappeared. For this reason, it is recommended that patients with LTOT be checked after 90 days. Although Chest Diseases specialists meet the correct criteria while prescribing LTOT, patients do not use the devices at home as recommended and exaggerate the duration of use when asked. The reasons for non-compliance included difficulty in managing the equipment, the absence of shortness of breath, limited range of motion, fear that treatment would not work "when it was needed", and feelings of embarrassment [7].

In this study, it was stated that the patients' compliance with the LTOT device was poor and 51.7% of the patients used the device less than recommended. Receiving nonspecific home care services did not have any effect on LTOT compliance. Studies indicate that compliance with domiciliary LTOT is suboptimal, and behavioral and psychological interventions are required to improve compliance [15]. The indication for LTOT needs to be better demonstrated in elderly patients with COPD. It has been suggested that after a few days of treatment in the hospital due to exacerbation of hypoxemia in elderly patients with COPD, future LTOT indication cannot be evaluated. If the oxygen saturation is 85%, oxygen deprivation test can be performed safely after 5-7 days of treatment and should be performed after 1 month of oxygen therapy [16].

We observed that five patients who received nonspecific home care services had poor device compliance, like other patients. Although it is concluded that receiving home care services does not affect compliance with NIV and LTOT devices, this finding should be evaluated with a large number of patients. Home care can identify problems, improve the usage of LTOT and allow interventions when needed. It is stated that smoking cessation, LTOT device maintenance and cleaning, use of a humidifier, and adjusting the length of the connector hose are the most common interventions. They may be beneficial in patients with LTOT noncompliance [17].

The cases in this study avoided all kinds of admissions to the hospital because of the COVID-19 pandemic. This can significantly worsen the general health status of geriatric patients.

Limitations

Our study comprises a very elderly population (≥80 years). Due to high rates of death in very elderly populations, the number of study participants was lower than expected. We could not monitor 70 patients' compliance to devices until they died. This can be regarded as a bias for our study because we only enrolled surviving patients. Also, the effects of home care on NIV and LTOT compliance should be assessed with a large number of patients.

Conclusion

Disruption in doctor visits and patient admissions leads to incompliance with LTOT and/or NIV devices and loss of motivation for their use. In pandemic conditions where patient admissions may be interrupted and morbidity and mortality risks increase, structured and specific home care services for respiratory failure patients become more important. Continuing education and motivation at home and providing on-site psychosocial support to caregivers for patients to use their devices regularly will increase the quality of life of patients and decrease the disease burden. We emphasize the importance of turning geriatric patients' staying at home into an advantage.

References

1. Ocaklı B. The Feasibility of Domiciliary Non-Invasive Mechanical Ventilation due to Chronic Respiratory Failure in Very Elderly Patients. Turk Thorac J. 2019 Apr 1;20(2):130-5. doi: 10.5152/TurkThoracJ.2018.18119.
2. Janssens JP, Derivaz S, Breitenstein E, De Muralt B, Fitting JW, Chevrolet JC, et al. Changing patterns in long-term noninvasive ventilation: a 7-year prospective study in the Geneva Lake area. Chest. 2003 Jan;123(1):67-79. doi: 10.1378/chest.123.1.67.
3. Özsancak Uğurlu A, Berk Takır H, Ergan B, İn E, Özyilmaz E, Ertan Edipoğlu Ö, et al. Approach of pulmonologists in Turkey to noninvasive mechanical ventilation use at home for chronic respiratory failure. Tuberk Toraks. 2016 Mar;64(1):1-8. English. doi: 10.5578/tt.8651.
4. Farrero E, Prats E, Manresa F, Escarrabill J. Outcome of non-invasive domiciliary ventilation in elderly patients. Respir Med. 2007 Jun;101(6):1068-73. doi: 10.1016/j.rmed.2006.10.005.
5. Cantero C, Adler D, Pasquina P, Uldry C, Egger B, Prella M, et al. Long-Term Non-invasive Ventilation: Do Patients Aged Over 75 Years Differ From Younger Adults? Front Med (Lausanne). 2020 Nov 11;7:556218. doi: 10.3389/fmed.2020.556218.
6. Nava S, Grassi M, Fanfulla F, Domenighetti G, Carlucci A, Perren A, et al. Non-invasive ventilation in elderly patients with acute hypercapnic respiratory failure: a randomized controlled trial. Age Ageing. 2011 Jul;40(4):444-50. doi: 10.1093/ageing/afr003.
7. American Thoracic Society. Statement on home care for patients with respiratory disorders. Am J Respir Crit Care Med. 2005 Jun 15;171(12):1443-64. doi: 10.1164/rccm.2504001.
8. Cirik MO, Yenibertiz D. What are the prognostic factors affecting 30-day mortality in geriatric patients with respiratory failure in the Intensive Care Unit? Pak J Med Sci. 2021 Jan-Feb;37(1):15-20. doi: 10.12669/pjms.37.1.3189.
9. Aksu T, Fadıloğlu Ç. Solunum sistemi hastalığı olan bireylerin evde bakım gereksinimi ve yaşam kalitesinin incelenmesi. Ege Üniversitesi Hemşirelik Fakültesi Dergisi. 2013;29(2):1-12.
10. Gilmour H. Unmet home care needs in Canada. Health Rep. 2018 Nov 21;29(11):3-11. PMID: 30485384.
11. Karakaş N, Bentli R, Fırıncı B, Zabcı B. Investigation of the relationship between depression and nutritional status of elderly patients in home care. J Surg Med. 2019;3(12):829-32.
12. Loengard AU, Boal J. Home care of the frail elderly. Clin Geriatr Med. 2004 Nov;20(4):795-807. doi: 10.1016/j.cger.2004.07.009.
13. Thumé E, Facchini LA, Tomasi E, Vieira LA. Home health care for the elderly: associated factors and characteristics of access and health care. Rev Saude Publica. 2010 Dec;44(6):1102-11. doi: 10.1590/s0034-89102010005000038
14. Swartz K, Collins LG. Caregiver Care. Am Fam Physician. 2019 Jun 1;99(11):699-706. PMID: 31150177.
15. Gauthier A, Bernard S, Bernard E, Simard S, Maltais F, Lacasse Y. Adherence to long-term oxygen therapy in patients with chronic obstructive pulmonary disease. Chron Respir Dis. 2019 Jan-Dec;16:1479972318767724. doi: 10.1177/1479972318767724
16. Andersson I, Johansson K, Larsson S, Pehrsson K. Long-term oxygen therapy and quality of life in elderly patients hospitalised due to severe exacerbation of COPD. A 1 year follow-up study. Respir Med. 2002 Nov;96(11):944-9. doi: 10.1053/rmed.2002.1370.
17. Gilmour H. Unmet home care needs in Canada. Health Rep. 2018 Nov 21;29(11):3-11. PMID: 30485384

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