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Care of a Patient with Dyspnoea in COVID-19

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Догляд за хворим із задишкою при COVID-19

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Introduction

Dyspnoea is a medical term for shortness of breath or difficulty breathing. It is an unpleasant feeling of lack of oxygen (O_2), associated with labored breathing, chest tightness and respiratory diseases. The reason is disparity between the body's current requirements for respiration and objective cardiorespiratory respiration [6, p. 346-397].

Dyspnoea is a very stressful symptom for the patient. The main goal of nursing care is to reduce the impact of dyspnoea on a person's life and to implement activities that lead to its alleviation. For nursing care to be effective, the nurse must work with other members of the multidisciplinary team [5, p. 24-26].

COVID-19 affects all age groups. Symptoms range from asymptomatic to acute respiratory distress syndrome (ARDS), acute inflammatory lung disease, or multiorgan failure. The most common symptoms include fever, sore throat and headache, cough, fatigue, myalgia.

These symptoms are difficult to distinguish from other respiratory infections. In more severe cases, the disease can progress to pneumonia, respiratory failure or death. These are mostly patients with other co morbidities. In addition to the respiratory system, it can also affect the gastrointestinal tract, renal, cardiovascular, central nervous system [7, p. 103-108].

In patients with COVID-19, oxygen therapy begins when the SpO_2 drops below 92%. In hypoxemia (SpO_2 92-94%), oxygen is administered by inhalation with a Hudson's mask or a Venturi mask with a flow rate >5 l/min. Oxygen must be humidified and heated. In adult patients with acute respiratory failure, oxygen is administered through a high flow nasal ventilation cannula, which can deliver up to 70 liters of oxygen per minute.

It is recommended to keep the oxygen saturation not higher than 96% in this case. The patient who have non-invasive ventilation and their condition does not improve, it is recommended to thoroughly re-evaluate the condition of the airways and perform early intubation [3, p. 6-15]. Oxygen therapy has calming, antibacterial, anti-inflammatory effects, it has a positive effect on the treatment of disease of the respiratory system in particular [2, 230 p.].

The aim of our article is to analyze the dyspnoea in patient with COVID-19 disease.

The main **method** of our research was case study. The primary source of information was the patient hospitalized in the Covid ward, Military Hospital in Ružomberok. The patient provided all the information voluntarily and agreed to its processing, subject to the condition of anonymity.

A 29-year-old patient hospitalized in the Covid ward with a diagnosis of extensive bilateral COVID-19 bronchopneumonia, hyposaturation (85%) and hypoxemic respiratory insufficiency. Patient was tested positive for the COVID-19 disease test on November 26, 2021. The clinical picture was dominated by febrility up to 39°C, dry irritating cough, back and chest pain, loss of smell and taste. She felt weak. The patient was treated by a general practitioner on an outpatient basis.

The physicians recommended prescribed treatment, rest regime, sufficient fluids, regular monitoring of body temperature, oxygen saturation with a pulse oximeter, in case of deteriorating health, telephone contact and consultation of the condition.

After a temporary improvement, the health condition deteriorated. On December 8, 2021, she was transported to the emergency room in the morning.

This is a patient with severe exogenous obesity (BMI 46.1), hypothyroidism, and no other more serious pre-disease. She did not receive the vaccination against COVID-19. Values of vital functions at blood pressure: 95/72 mmHg, P: 95 /min, D: 2 1/min, SpO_2: 90% – oxygen therapy during transport 10 l/min.

The results of laboratory values showed a reduction in blood pO_2 8.04 kPa, pCO_2 – 4.40 kPa and blood saturation O_2 93%. In the laboratory picture, the ALT (Alanine Aminotransferase) value was increased by 6.25 µcat/l, AST (Aspartate Aminotransferase) 1.78 µcat/l, uric acid 349 µmol/l, CRP (C-reactive protein) 19,1 mg/l, other values without pathology.

The patient was prescribed medication. She was given corticoids, ATB (antibiotics), vitamin C intravenously, antithrombotic treatment subcutaneously. Polyvitaminosis, symptomatic, immunomodulatory, hepatoprotective treatment orally and oxygen at a flow rate of 25 l/min.

Still prescribed calm on the bed and pronation position, laboratory monitoring, lower limb bandage, fluid balance, respiratory rehabilitation with a physiotherapist.

Regularly monitored ECG and vital signs, the patient's general condition or the occurrence of complications. SpO_2: 84% – 90% – 93%, oxygen applied to the face mask with a flow rate of 15 l/min – 26 l/min. (keep SpO_2 above 94%). We measured the oxygen saturation with a pulse oximeter (see Graf.). We assessed Dyspnoea on the Borg's scale of dyspnoea (see Table).

Dyspnoea already present with minimal physical exertion. Barthel's test of 56 points of moderate degree dependence. The patient has increased intrapsychic tension, survives anxiety, negatively tuned. Contact with the family through a nurse and a doctor. The care of a patient with dyspnoea was comprehensive. We provided hygienic care on the bed, regular positioning, feeding, administered drugs intravenously, care for i.v. cannula, permanent catheter. Ensured satisfaction of spiritual needs.

The patient was instructed about respiratory hygiene (coughing, sneezing, hand hygiene), restraint of movement and keeping calm in bed.

On the 1st – 3rd day of hospitalization, the pO_2 values were: 88% – 90% – 93%, oxygen applied to the face mask with a flow rate of 15 l/min – 26 l/min. Borg's scale of dyspnoea was scored number 5 – severe dyspnoea. The patient felt short breath even with minimal physical exertion. To assess self-sufficiency, we used the Barthel Basic Daily Activity Test (ADL), which scored 90 points – a milder dependency.

On the 4th-6th days the dyspnoea was present only during active exercises during rehabilitation, she engaged in self-service activities, SpO_2 values: morning – 96%, lunch – 98%, evening – 97%.

The patient's oxygen administration was adjusted. Oxygen of 25 /min was administered in the morning, in the afternoon and in the evening was reduced to 15 l/min. Prescribed drug treatment was given. The score of dyspnoea according to the Borg's scale reached number 3 – a medium degree of dyspnoea, we noticed a decrease in respiratory difficulties during self-service activities, dyspnoea was present only if she performed an active exercise and respiratory rehabilitation.

The patient received medication without change. The Borg's scale scored 2 – mild dyspnoea – noted mild shortness of breath when walking short distances. Vital functions values: BP: 115/70, P: 68 /min, B: 13 /min, and SpO_2 – 97%). Respiratory rate was regular, SpO_2 values during the night ranged from 94-96%, at 1:00 a.m., SpO_2 drop below 93%, administered oxygen through a face mask a flow rate of 3 l/min, which the patient inhaled into the morning.

On the 7th she realized breathing exercises, practice walking around the room. Oxygen was prescribed only in the morning with a flow rate of 6 l/min, then it was reduced rate of 3 l/min.

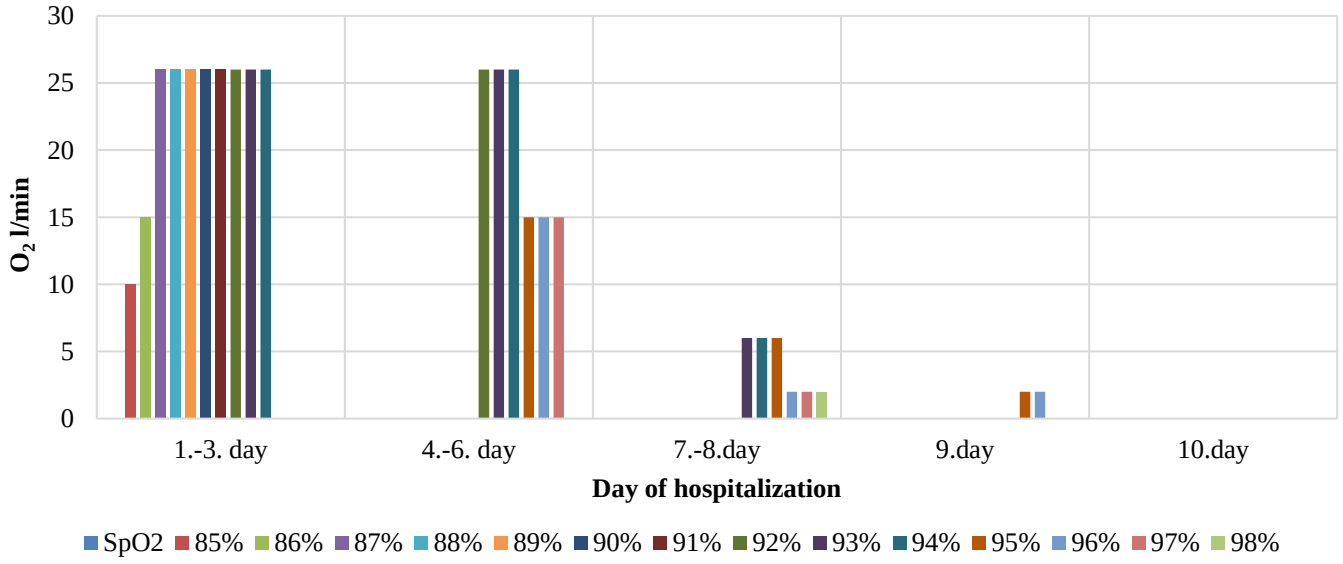
On the 8th day the oxygen was prescribed only in the morning with a flow rate of 2 l/min, after breakfast complete discontinuation, when SpO_2 drops below 94% re-inhalation O_2 – 2 l/min. The strict rest regime has been lifted. With a physiotherapist were carried out breathing exercises and short-distance walking and stair walking exercises. During the exercise, she felt a shortness of breath, when she needed to rest, no other changes were observed.

The patient was independent in self-service activities. Borg's scale scored 2 – mild dyspnoea. SpO_2 dropped to 93%. She was given oxygen through a face masks at a flow rate of 2 l/min. The same treatment was applied at night.

On the 9 th day was prescribed complete abolition of oxygen therapy, she realized breathing exercises, practice of walking up the stairs, after which a shortness of breath was present, applied oxygen 2 l/min, SpO_2: 95% – 98%.

Borg´s scale scored a 2-degree shortness of breath, dyspnoea was present only when walking up the stairs.

On the 10th day, the patient was released to home care, without the need for oxygen therapy.



Graf. **Oxygen therapy**

Table. **Borg's scale of dyspnoea**

Degree of dyspnoea	Intensity of dyspnoea	The days of the hospitalization
0	Absent shortness of breath	
0.5	Completely insignificant shortness of breath	
1	Very mild degree of shortness of breath	
2	**Easy degree of shortness of breath**	**7th to 10th day of hospitalization**
3	**Medium degree of shortness of breath**	**4th to 6th day of hospitalization**
4	Predominantly severe dyspnoea	
5	**Heavy degree of shortness of breath**	**1st to 3rd day of hospitalization**
6	Transition between 5.-7. degree of shortness of breath	
7	Very severe degree of shortness of breath	
8	The transition between 7.-10. degree of dyspnoea	
9		
10	Maximum degree of dyspnoea	

Discussion

COVID-19 affects all age groups. Symptoms range from asymptomatic to acute respiratory distress syndrome (ARDS), acute inflammatory lung disease, or multiorgan failure. The most common symptoms include fever, sore throat and headache, cough, fatigue, myalgia. In more severe cases, the disease can progress to pneumonia, respiratory failure or death. These are mostly patients with other comorbidities. According to the authors Turčan, Dzianová, Bacmaňáková [7, p. 103-108], the development of dyspnoea occurs within 5 days from the onset of symptoms, the need for hospitalization within 7 days and the development of ARDS occurred on approximately day 8. Intensive care was required in 25-30% of patients. The improvement in health begins at the 2nd – 3rd week. The average length of hospital stay in cured patients was 10 days.

We continuously measured the patient's vital signs and blood oxygen saturation using a pulse oximeter and laboratory examination of acid-base balance, based on which the doctor prescribed the flow of oxygen throughout the hospitalization. When the saturation decreased to 85%, the highest delivered oxygen flow reached 25l/min. We regularly monitored the patient's condition and oxygen flow, there were no complications, she tolerated the required amount of oxygen.

Firement [3, p. 6-15] argues that in patients with COVID-19, oxygen therapy should be started when blood oxygen saturation drops below 92%. Oxygen is administered by inhalation using a Hudson's or Venturi mask with a flow rate > 5 l/min. according to the doctor's office.

In cooperation with a physiotherapist, the patient regularly performed breathing exercises (diaphragmatic breathing, breathing with puffy lips, breathing against resistance using a respiratory trainer, respiratory muscle training).

Marshall [5, p. 24-26] states that breathing exercises are the most appropriate techniques for alleviating dyspnoea. They aim to reduce the effort required to breathe and have a significant relaxing effect. Promoting deeper breathing leads to a normal breathing frequency and promotes shortness of breath.

Borg's dyspnoea scale is a suitable assessment tool for assessing the effect of treatment and respiratory rehabilitation. Based on a ten-point scale, it allows you to quantify the intensity of dyspnoea in daily activities, physical activity and it can help us assess its impact on the patient's functional condition and quality of life.

For the first 3 days of the patient's hospitalization, the Borg's scale scored dyspnoea scale reached grade 5, which is severe degree of a dyspnoea. Dyspnoea was already present with minimal physical exertion and self-service activities that required the help of medical staff. On the 4th-6th day dyspnoea acquired 3rd moderate dyspnoea.

Dyspnoea was present only during more demanding exercises within respiratory rehabilitation, we noticed a retreat during self – service activities. In the last 3 days of the patient's hospitalization (day 7-10), dyspnoea has reached a degree of 2 – mild shortness of breath, when she was walking up the stairs.

Caring for patients with COVID-19 is challenging in terms of meeting basic living needs. The self-sufficiency and mental state of patients is significantly impaired.

Bajwah et al. [1] states that anxiety associated with shortness of breath, social isolation and fear is to some extent present in all patients who have COVID-19. With the right care and empathic approach, we can help the patient cope with the critical period and help him return to normal life.

Shortness of breath is more important as a clinical symptom in lung diseases. Most literature associates the problem of negative emotions, such as anxiety and depression, with lung diseases [8, 262 p.].

Conclusions

The case report showed that COVID-19 disease can have a serious course not only in elderly patients with chronic diseases, but also in young and healthy people. The patient was hospitalized after the failure of outpatient treatment, due to severe dyspnoea, SpO_2 in blood reached 85%. During hospitalization, the patient was provided with comprehensive treatment-drug therapy, oxygen therapy, rehabilitation care and psychological support.

The patient's vital signs, blood oxygen saturation and fluid intake were monitored on regular basis. Gradually, the patient's saturation values normalized until she was

discontinued with oxygen therapy. The dyspnoea was alleviated to a mild degree according to the Borg's scale, and after ten days of hospitalization, she was released to home care in a stable condition.

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The purpose. In this paper we deal with the issue of dyspnoea. To deal with dyspnoea, it is necessary to determine the causes of dyspnoea, assess subjective and objective symptoms and apply adequate treatment.

Methods. The main qualitative method of our research was a case report. We focused on the case of a patient with COVID-19 disease with extensive bilateral pneumonia. Dyspnoea was assessed by the Borg´s scale of dyspnoea. Borg´s dyspnoea scale allows you to quantify the intensity of dyspnoea during daily activities, physical activity, and it can help assess its impact on a patient's functional status.

Results and discussion. In this case report, we address the case of a 29-year-old patient with COVID-19 extensive bilateral pneumonia. The patient was hospitalized in the Covid ward for 10 days. On the first days of hospitalization dyspnoea according to the Borg's scale reached grade 5 – severe dyspnoea, SpO_2 in the blood was 85 %. The patient was given oxygen therapy, drug treatment. We monitored her vital signs and laboratory parameters regularly.

The treatment also included rehabilitation and breathing exercises, psychological and spiritual assistance. The patient for bed rest was addicted to daily activities. Dyspnoea was alleviated on the 7th to 10th day of hospitalization, when her oxygen supply was gradually reduced and the patient's load tolerance increased. According to the literature, the health improves to the 2nd-3rd week.

Conclusions. In this paper we presented nursing care for a patient with COVID-19 pneumonia and intervention to manage dyspnoea. Dyspnoea was very stressful for the patient and required hospitalization therapeutic and nursing interventions. Interdisciplinary cooperation was an important factor in the effectiveness of nursing interventions.

Key words: dyspnoea, COVID-19, nurse, nursing care.

Ціль. У цій статті ми маємо справу з проблемою задухи. Для боротьби з диспное необхідно з'ясувати причини диспное, оцінити суб'єктивні та об'єктивні симптоми та призначити адекватне лікування.

Методи. Основним якісним методом нашого дослідження була перезентація клінічного випадку. Ми зосередилися на випадку хворого на COVID-19 із обширною двосторонньою пневмонією. Задуху оцінювали за шкалою диспное Боргса. Шкала диспное Боргса дозволяє кількісно визначити інтенсивність диспное під час повсякденної діяльності, фізичної активності, а також може допомогти оцінити її вплив на функціональний стан пацієнта.

Результати і обговорення. У цьому звіті ми розглядаємо випадок 29-річного пацієнта з обширною двосторонньою пневмонією COVID-19. Хворий перебував у ковідному відділенні 10 днів. У перші дні госпіталізації задуха за шкалою Боргса досягла 5 ступеня – тяжка задуза, SpO2 крові 85 %. Хворому проведено оксигенотерапію, медикаментозне лікування. Ми регулярно контролювали життєві функції та лабораторні показники.

Лікування також включало реабілітаційні та дихальні вправи, психологічну та духовну допомогу. Хворий на постільний режим був залежний від повсякденної діяльності. Задуха була купірована на 7-10-й день госпіталізації, коли

поступово зменшувалось надходження кисню та підвищувалася переносимість навантаження. За даними літератури, самопочуття покращується до 2-3-го тижня.

Висновки. У цій статті ми представили сестринський догляд за пацієнтом із пневмонією COVID-19 та втручання для лікування задухи. Задуха була сильним стресом для пацієнта і потребувала госпіталізації, терапевтичних та медсестринських втручань. Міждисциплінарна співпраця була важливим фактором ефективності медсестринських втручань.

Ключові слова: диспное, COVID-19, медсестра, сестринський догляд.

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Conflicts of interest: absent.

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