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Nursing care provided to critical patient with COVID-19: a case report

Atención de enfermería brindada al paciente crítico con COVID-19: reporte de un caso

Assistência de enfermagem prestada ao paciente crítico com COVID-19: um relato de caso

ABSTRACT

Objective: To present nursing care in the care of critical patients with COVID-19 and discuss the importance of the performance of a multidisciplinary team. **Method:** This is an observational, descriptive, retrospective study, in the case of report mode, with data collection from medical records, carried out from April 17 to May 14, 2020. **Result:** Patient seen at the emergency room, with need for orotracheal intubation and immediate transfer to the intensive care unit. The case worsened, hemodynamic instability, continuous dialysis, need for intensive nursing care to control skin lesions, vasoactive drugs, hemodynamic maintenance and prone position. He improved and was discharged in 28 days. **Conclusion:** The complexity of the case associated with a little known and highly infectious treatment pathology is challenging for multidisciplinary care in intensive care and is related to a high demand for direct and indirect care.

DESCRIPTORS: Coronavirus infections; Critical Care Nursing; Nursing Care; Patient Care Team, Case Reports.

RESUMEN

Objetivo: Presentar los cuidados de enfermería en el cuidado de pacientes críticos con COVID-19 y discutir la importancia del desempeño de un equipo multidisciplinario. **Método:** Se trata de un estudio observacional, descriptivo, retrospectivo, en el caso de modo informe, con recolección de datos de historias clínicas, realizado del 17 de abril al 14 de mayo de 2020. **Resultado:** Paciente atendido en urgencias, con necesidad de intubación orotraqueal y traslado inmediato a la unidad de cuidados intensivos. El caso se agravó, inestabilidad hemodinámica, diálisis continua, necesidad de cuidados intensivos de enfermería para control de lesiones cutáneas, fármacos vasoactivos, mantenimiento hemodinámico y decúbito prono. Mejoró y fue dado de alta en 28 días. **Conclusión:** La complejidad del caso asociada a una patología terapéutica poco conocida y altamente infecciosa es un desafío para la atención multidisciplinaria en cuidados intensivos y se relaciona con una alta demanda de cuidados directos e indirectos.

DESCRIPTORES: Infecciones por Coronavirus; Enfermería de Cuidados Críticos; Atención de Enfermería; Grupo de Atención al Paciente, Informes de Casos.

RESUMO

Objetivo: Apresentar os cuidados de enfermagem na assistência ao paciente crítico com COVID-19 e discutir a importância da atuação de uma equipe multiprofissional. **Método:** Trata-se de um estudo observacional, descritivo, retrospectivo, na modalidade relato de caso, com coleta de dados de prontuário, realizado no período de 17 de abril a 14 de maio de 2020. **Resultado:** Paciente atendido no pronto atendimento, com necessidade de intubação orotraqueal e transferência imediata para unidade de terapia intensiva. Evoluiu com agravamento do caso, instabilidade hemodinâmica, diálise contínua, necessidade de cuidados intensivos de enfermagem para controle de lesão de pele, drogas vasoativas, manutenção hemodinâmica e manobra de decúbito prona. Apresentou melhora e alta em 28 dias. **Conclusão:** A complexidade do caso associada a uma patologia de tratamento pouco conhecido e de alta infectividade é desafiadora para a assistência multidisciplinar na terapia intensiva e encontra-se relacionada a uma alta demanda de cuidados diretos e indiretos.

DESCRIPTORIOS: Infecções por Coronavírus; Enfermagem de Cuidados Críticos; Cuidados de Enfermagem; Equipe de Assistência ao Paciente; Relato de Caso.

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INTRODUCTION

Characterized as a global pandemic in March 2020 by the World Health Organization (WHO), COVID-19, later classified as SARS-CoV-2 by the International Virus Taxonomy Committee, ⁽¹⁾ is related to an acute respiratory disease caused by a new coronavirus, highly contagious and whose evolution is still little known. ⁽²⁻³⁾

This pandemic, which is currently characterized as a public health emergency, broke out in Wuhan, China, in December 2019, and according to WHO data it registered on February 12th, 2021 a total of 107.423.526 cases and 2.360.280 deaths worldwide. ⁽³⁾

The period for onset of symptoms by SARS-CoV-2 was 5,2 days, however some patients may have a long incubation period, greater than 14 days. Although this virus causes a lower mortality rate than severe acute respiratory syndrome (SARS), its transmission between individuals is much more prevalent, another worrying factor, is the fact that a portion of the infected population is asymptomatic or develops the mild form of the disease. For this reason, social isolation is essential in controlling new ones. ⁽⁴⁾

With regard to the complexity of the cases, it is divided as a slight majority (81%), 14% in need of hospitalization and about 5% evolves severely in need of intensive care, among the latter a mortality of 615 is identified, reaching 81% in patients requiring invasive mechanical ventilation. ⁽⁵⁾

In Brazil, intensive care units (ICUs) demonstrate an overload of patients and, consequently, of work for profes-

sionals working in these sectors. In a pandemic context, in which there is a sudden increase in labor demands, this situation is even more exacerbated. ⁽⁶⁾

The ICU is a place designed to provide specialized care to critically ill patients in a serious and recoverable condition. In this context, in order for the high demand for care to be effective and achieve the expected goal, a multidisciplinary team is required, committed, patient-centered and with the understanding that safe and quality care depends on all the professionals involved, with equal intensity within the area of competence of each member of the team, composed of doctor, nurse, physiotherapist, pharmacist, psychologist and nutritionist. ⁽⁷⁾

According to the Federal Nursing Council (COFEN), in 2020 Brazil registered more than 2 million active enrollments, which include assistants, technicians and nurses, which validates the numerical representativeness of this class. ⁽⁸⁾ This volume is also expressed in the direct assistance provided to critical patients, as described in Cofen Resolution No. 293/2004, which characterizes the need for 17,9 hours of nursing assistance per patient in intensive care, which demonstrates a dimension of 8 patients per nurse and 2 per nursing technician in this scenario. ⁽⁹⁾

The emergence of COVID-19 brought the need for adjustments in the training of professionals, students and the restructuring of health services, adapting to the scenario, adopting control and safety measures for those involved in the process. ⁽¹⁰⁾

In view of this, the relevance of understanding and mastering the nursing

care provided to patients infected with COVID-19 is noteworthy, in order to guarantee effective assistance to this population. In addition, it is necessary to emphasize the importance of a cohesive performance among the multiprofessional team in a situation of such complexity, as the current one. This study aims to present nursing care in the care of critically ill patients with COVID-19 and discuss the importance of the performance of a multiprofessional team.

METHOD

The study was carried out with the authorization of the institution and approved under opinion number 4.061.619 (CAAE 32532620.6.0000.5461) respecting all ethical precepts in accordance with CNS Resolution No. 466, ⁽¹¹⁾ of December 12th, 2012, for conducting research involving human beings, preserving the identity of the participant.

This is an observational, descriptive, retrospective study, in the case report modality. The case study method is characterized by reporting a patient's outcome, without testing comparisons, and is useful for presenting new and rare cases and generating hypotheses. ⁽¹²⁾ Held from April 17th to May 14th, 2020, in a large philanthropic hospital in the city of São Paulo.

The sample was a 46-year-old male patient, diagnosed with COVID-19 with severe acute respiratory syndrome (SARS), promptly attended by the multiprofessional team in the intensive care unit of the study site.

This patient was selected because he is a young patient admitted to the intensive care unit diagnosed with CO-

VID-19, the data collection and case monitoring was based on the collection of data from medical records.

Nursing developments and a multidisciplinary team were observed, and information from laboratory tests was obtained through the electronic medical record system, which were associated with the care practice of the intensive care unit team at the study site.

The results of the data obtained from the medical record are presented in a descriptive form, sharing the practical experience.

RESULTS

46-year-old adult male patient, born and living in São Paulo, with a previous history of untreated systemic arterial hypertension (SAH), diabetes mellitus (DM) using metformin and obesity with BMI 35,7. He sought emergency care with a report of onset of flu-like symptoms seven days ago, characterized by fever, body pain and cough. On the fifth day after the onset of symptoms, worsening of cough and fever occurred, associated with dyspnea at rest, still conscious and oriented, with a respiratory rate of 40 rpm, peripheral saturation of 45%, after oxygen supply with a 10l/min reservoir mask, saturation 76%.

The nursing team was present with this patient on his admission to the emergency room, where he performed the screening and followed the flow for suspected cases of COVID-19, identified the severity of the case together with the multidisciplinary team, performed anamnesis, physical examination and planned care. From this, together with the multiprofessional team, the need for orotracheal intubation (OTI) was identified before referring to the ICU.

The OTI is performed by the doctor, with the presence of the nurse and physiotherapist, for this procedure the use of personal protective equipment by the team is necessary for precaution by aerosols, which includes waterproof apron, hat, glove, N95 mask, goggles and face shield.

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When transporting to the ICU, the nurse uses the SBAR (situation, background, assessment, recommendation) tool for a shift change between units with structured communication and greater information security. He was referred to the ICU with a multiparametric monitor, transport ventilator, briefcase composed of emergency material, a single elevator flow and accompanied by the nursing and medical staff.

The nurse has managed the care of this patient since arriving at the ICU, prioritized the most urgent care, organized the team and delegated the pertinent activities to the nursing technicians, with the guarantee of an accurate and safe care for the patient. He carried out the systematization of nursing care, which includes the nursing history, nursing diagnosis and nursing prescription.

The patient was admitted in a severe, hemodynamically unstable, hypotensive and tachycardic condition, with the passage of a central venous catheter (CVC) in the right jugular vein and initiated with vasoactive drugs. With the aid of the bispectral index (BIS), sedation and curarization with cisatracurium were adjusted.

Arterial blood gases were collected to assess ventilatory support, PH: 7,09, pO_2 : 86 mmHg, pCO_2 : 65 mmHg, HCO_3^- : 19mmol/L, BE: - 10, SO_2 92%, with controlled pressure ventilatory parameters 18, FiO_2 100%, FR 25, tidal volume 515ml, $ETCO_2$ 46, with a PaO_2/FiO_2 ratio of 86, with indication of alveolar recruitment maneuver, it was performed with PEEP of 20, without complications in the procedure. Arterial blood gases collected after maneuver, PH: 7,10, pO_2 : 83 mmHg, pCO_2 : 58 mmHg, HCO_3^- : 18,5 mmol/L, BE: - 11, SO_2 91%, PaO_2/FiO_2 83 ratio, with hypoxemia refractory to procedure.

A catheter was passed to read the invasive blood pressure (IBP), to assist in the collection of blood gases and to maintain a rigid assessment of systolic, diastolic and average blood pressure for the adequacy of vasoactive drugs and

to ensure peripheral perfusion. As an aid in the strict control of diuresis and fluid balance to monitor renal function, a delayed bladder tube was inserted. In order to initiate nutritional support as early as possible, a nasoenteral tube was introduced, whose position was confirmed by means of an abdominal radiography.

Nursing care in intensive care involved handling the devices, changing the position, controlling the level of sedation using the Richmond Agitation-Sedation Scale (RASS), controlling hemodynamic instability and using PPE during direct care. In patients without sedation, neurological control is based on the assessment of the presence of delirium, using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) scale.

The patient was evaluated to enter the new systemic anticoagulation study protocol, for all patients with positive COVID-19, in which anticoagulation with heparin in an infusion pump at 1000 IU/h is indicated, schedule laboratory test collections for strict control of activated partial thromboplastin time (APTT) and bleeding risk assessment.

With a history of poorly controlled diabetes and due to SARS, she progresses with hyperglycemia, with indication for the institutional protocol with the use of regular 1IU/ml insulin in an infusion pump, with hourly glycemic control and dose adjustment using the insulinapp application. The protocol transition took place over ten days for long-term use of insulin and subcutaneous supplementation with rapid insulin. The protocol is conducted by the nurse, from its indication, maintenance and conversion of the insulin pump to a basal dose, with supplementary corrections.

After the implanted measures, a patient still in a serious condition and with no significant improvement in the $\text{PaO}_2/\text{FiO}_2$ ratio, presented criteria for indicating the prone procedure, performed with the appropriate adhesive dress-

ing protections for skin lesions and viscoelastic positioners, within three hours of admission to the ICU. The procedure took place with the presence of a multidisciplinary team. He showed improvement in arterial blood gas PH: 7,26, pO_2 : 118 mmHg, pCO_2 : 53 mmHg, HCO_3^- : 23 mmol/L, BE: -4,3, SO_2 97%, with a $\text{PaO}_2/\text{FiO}_2$ ratio of 131.

In view of this, he remained in the prone position for eighteen hours, with improved breathing pattern, weaning from FiO_2 to 55%, arterial blood gas PH: 7,42, pO_2 : 93 mmHg, pCO_2 : 41 mmHg, HCO_3^- : 26 mmol/L, BE: +1,7, SO_2 99%. The return to the supine position, with the support of the multidisciplinary team, occurred without complications, however, despite the use of adhesive dressings and positioners to protect bony prominences, a bullous lesion in the infra-mammary region was identified, and the proposed intervention was to apply a protective dressing, and the assessment of the lesion daily.

It is worth mentioning the importance of changing the position of the arms and head every two hours, which was carried out strictly by the nursing team. The main care instituted by nursing was protection for the eyes, proper fixation of the orotracheal tube, placement of the electrocardiogram electrodes on the shoulders and side of the chest, to ensure monitoring throughout the procedure, care with all invasive devices to prevent accidental removal.

On the second day of admission, renal function worsened, entry creatinine from 1,27 mg/dl to 4,32 mg/dl, anuric even with diuretic stimulus, diagnosed acute kidney injury, indicated continuous renal replacement therapy, continuous veno-venous hemodiafiltration (CVVHDF). He evolved after four days with improved renal and hemodynamic function, interrupted dialysis and maintained control of diuresis through fluid balance and stimulation with furosemide.

The assembly of the circuit, programming of the equipment with the medical prescription, patient and system care

during dialysis, such as pressure controls, exchange of dialysis bags, control of regional anticoagulation with collection of exams is performed by the nurse, and requires clinical observation and constant monitoring to evaluate the results of the therapy.

In view of this context, over time, he showed a significant improvement in the ventilatory pattern, with extubation after seven days with success, he continued using an O_2 catheter at 2l/min and obtained hemodynamic improvement with weaning from vasoactive drugs. However, she had hyperactive delirium, which was difficult to control, which prolonged her hospital stay by 28 days, progressing to hospital discharge and home rehabilitation.

DISCUSSION

The study reports a young patient, with comorbidities and progression to severe presentation of the disease assisted by the multiprofessional care team, with worsening and subsequent improvement of the condition and discharge from intensive care, demonstrating the effectiveness of planned care and the importance of team integration.

The nursing team is essential in the care of critical patients and it is up to the nurse, privately, to carry out the systematization of nursing care (SAE). In initial care, anamnesis makes it possible to identify problems, determine diagnoses and plan care, and the physical examination assesses the patient using signs and symptoms to identify imbalances in the health and disease process. In addition, the nurse acts as a mediator between patient, multi professional team, family and assists in resolving and coping with health problems.⁽¹³⁾

As in this case, in patients with COVID-19 who have moderate or severe respiratory failure, characterized by a respiratory rate > 30rpm and hypoxemia with a $\text{PaO}_2/\text{FiO}_2$ ratio <200mmHg, the recommendation is early OTI. The aim is also to protect the health team

from viral transmission, therefore, the use of non-invasive mechanical ventilation should be limited due to the risk of aerosol generation and viral spread.⁽¹⁴⁾

Avoid using the bag-valve-mask. Use of adequate sedation and, if possible, separate material for intubation of difficult airways, to ensure intubation on the first attempt. Ensure that a closed suction system and the use of HMEF (Heat and Moisture Exchangers) and HEPA (High Efficiency Particulate Arrestance) filters will be installed in the ventilator's expiratory branch.⁽¹⁵⁾

The recommendation for a patient with COVID-19 is mechanical ventilation (MV) performed in controlled volume mode and for that it is necessary to use deep sedation, in order to improve lung compliance, adaptation to MV, tolerance to hypercapnia, caused by protective ventilation with low tidal volume, and to reduce the risk of ventilator-induced lung injury. Some patients may still need neuromuscular blockers due to low lung compliance, asynchrony in the ventilator or agitation.⁽¹⁴⁾

The management of sedation and analgesia in the ICU is essential for quality care, providing comfort for the patient, clinical improvement and reduction of adverse events, such as accidental extubation, loss of invasive devices and falls. For this reason, the use of scales to assess the patient's level of sedation provides greater safety for the team, from ensuring deep sedation to the most superficial and safest for ventilatory weaning.

In this case, the RASS Scale was applied by the nurse, expressed numerically by a variation of 10 points ranging from +4, in which the patient exhibits aggressive, violent and dangerous behavior, up to the extreme (-5), in which the individual in Deep sedation is unable to be aroused, with no response to sound and physical stimuli.⁽¹⁶⁾

The use of sedation and the patient's clinical conditions led to hemodynamic instability. The use of the vasoactive drug (VAD) aims to correct cardiovascular changes, thereby restoring the

supply of oxygen and nutrients to the tissues and preventing cell death and, consequently, the organs. However, the

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use of VAD has risks and can have complications for patients. Medication administration is an activity performed by the nursing team and, therefore, which must know its indication, mechanism of action, dosages and side effects.⁽¹⁷⁾

VADs should preferably be administered through a central venous catheter (CVC). The handling of the CVC is the responsibility of the nursing team, and hand hygiene before and after the manipulations, dressing using the aseptic technique, daily inspection for signs of infection when inserting the catheter, calculation in micrograms/kg/minute, double check at the time of administration, when exchanging bags and programming the infusion pump.⁽¹⁸⁾

The control of glycemia in the ICU is performed by the nursing team, with protocols for the correction of hyperglycemia, including the application of an insulin pump, as it is common in critically ill patients and is associated with a worse prognosis. It is noteworthy that diabetes is the second most common comorbidity in critically ill patients with COVID-19, in addition, studies show difficult glycemic control in these patients.⁽¹⁹⁾

In patients diagnosed with COVID-19, the biggest challenge in nursing care management is to reduce the need for contact, avoiding exposure and the risk of contamination by the team and controlling the use of personal protective equipment.

The recommendations for the use of PPE and policies that mitigate the exposure of professionals emphasize the use of N95 mask, waterproof apron, gloves, eye protection (glasses or mask with visor), protective measures applied rigorously due to transmission in the air by procedures that generate aerosols and hand washing as a way to prevent the virus from spreading.⁽²⁰⁾

The prone position consists of providing ventilatory support with the patient lying in a prone position, and is used as an additional therapy for the treatment of severe hypoxemia caused by ARDS.

The benefits of this maneuver are aided in a better redistribution of the alveolar liquid contents and reduction in the thickness of the capillary membrane by reducing the weight offered by the structures and organs, with improved non-dependent ventilation. Such changes have a direct effect on the hemodynamics of gas exchange, on respiratory mechanics and on the reduction of deleterious effects caused by lung injury induced by mechanical ventilation, which provides statistically significant benefits in reducing mortality.⁽²¹⁻²²⁾

In clinical practice, the prone position has been performed associated with a low tidal volume in the ventilatory support when an acceptable response is not obtained through the alveolar recruitment maneuver (ARM) and the titration of the Positive End-Expiratory Pressure (PEEP) in the supine position in patients with severe ARDS, that is, $\text{PaO}_2/\text{FiO}_2 \leq 100 \text{ mm/Hg}$ with $\text{PEEP} > 5 \text{ cm/H}_2\text{O}$. Satisfactory results are expressed by improving the $\text{PaO}_2/\text{FiO}_2$ ratio by up to 20%, increasing lung compliance and decreasing shunt areas. The time indicated for its effectiveness is a minimum of 12 and a maximum of 20 hours, variations occur according to the institutional protocol and patient stability.⁽⁵⁾

In critical patients with COVID-19, the maneuver is indicated early, as they do not present a good response to PEEP titration.⁽²³⁾ However, despite the clear benefits, it needs to be carried out under specific conditions and indications and the institution must have a

trained medical, nursing and physical therapy team.⁽²¹⁻²²⁾

One study developed a "checklist" for positioning in order to guarantee a safe procedure and divided it into three moments: the pre, during and post-maneuver. In this check, we highlight the care with the integrity of the skin and eyes, the fixation of invasive devices, the cardiac and peripheral oximetry monitoring, the level of sedation, the pause and return of the enteral diet, the importance of not pausing the infusion of vasopressors and parenteral diet and the technique of enveloping and turning the patient in three stages.⁽²⁴⁾ Procedures applied at our institution in order to ensure patient safety.

The role of the intensive care nurse at the time of continuous dialysis consists of monitoring the patient, detecting abnormalities and prompt intervention to ensure a safe and efficient procedure for the patient. The nurse must ensure that the prescribed dialysis dose and the method performed safely, minimizing the inherent risks, detecting, acting and notifying possible complications early.⁽²⁵⁾

The diagnosis of COVID-19 can contribute to the production of inflammatory mediators in the central nervous system, prolonged use of sedation and mechanical ventilation, in addition, there are environmental factors, caused by social isolation, such as the absence of family visits. The use of the Confusion Assessment Method for Intensive Care (CAM-ICU) scale is strongly recommended to make the

diagnosis of delirium in critically ill patients.⁽²⁶⁾

During the period of delirium and psychomotor agitation, the recommendation is for pharmacological management due to the risk of adverse events, such as device traction, extubation or even falling of the patient. During the hospitalization period, the multidisciplinary team needs a calm, awake and collaborative patient to provide the relevant interventions for the prevention and treatment of delirium, such as early mobilization, interaction with the family and reorientation.⁽²⁷⁾

As a limitation, this study represents the care of a single patient in a large center in the city of São Paulo, different methods of care and technologies may be present in other centers or cities.

CONCLUSION

In this study, the complexity of caring for a critically ill patient was demonstrated, with a disease in which treatment is challenging and has a high rate of infectivity for the entire health team. The care provided requires specialized and highly trained professionals to understand the clinical conditions of each patient. In this context, the nursing team, which comprises the largest number of professionals in this sector, has an essential role in the care provided from admission to the moment of discharge of these patients, in which they guarantee the maintenance of care quality and act in the prevention of adverse events. ■

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