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CASE REPORT

Guillain Barré with respiratory compromise, a clinical case of pediatric emergency

Guillain Barré con compromiso respiratorio, un caso clínico de emergencia pediátrica

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ABSTRACT

Clinical case of a 2-year-old boy diagnosed with severe respiratory failure and Guillain-Barré syndrome, with the objective of managing a care plan to restore respiratory distress. Using the Marjory Gordon's health patterns assesment, 4 NANDA-I (NANDA Internationa taxonomy) diagnoses were found, prioritized and analized according to the OPT model. The care plan and execution was based on NOC and NIC taxonomy. The care plan successfully achieved airway stability and provided quality care.

Keywords: Respiratory Insufficiency; Guillain-Barré Syndrome; Nursing Care; Case Reports.

RESUMEN

Caso clínico niño de 2 años con diagnóstico de insuficiencia respiratoria severa y Guillain Barré, con el objetivo de gestionar un plan de cuidados para restablecer el distrés respiratorio. A partir de la valoración por patrones de Marjory Gordon, se identificó 4 etiquetas diagnósticas según taxonomía NANDA Internacional (NANDA-I), se priorizó y observó las relaciones entre etiquetas modelo AREA. La planificación y ejecución del plan de cuidados fue a partir de las taxonomías NOC, NIC. El plan de cuidados logró estabilidad de la vía respiratoria, y brindó un cuidado de calidad.

Palabras clave: Insuficiencia Respiratoria; Síndrome de Guillain-Barré; Atención de Enfermería; Informe de Caso.

INTRODUCTION

Guillain-Barré syndrome (GBS), an acute polyradiculopathy of the immune system, affects the peripheral nerves. Worldwide, the annual incidence is 1 to 3 per 100 000 inhabitants, and in Latin America, it varies from 0,40 to 2,12 per 100 000 inhabitants. In Peru, in 2021, 133 cases were confirmed, 8,4 % in the pediatric population, and the cumulative incidence rate (CIR) was 6,1 per million inhabitants,[1] but there is currently an epidemiological alert with 191 cases so far in 2023, of which 12,04 % are children.[2,3]

The affected children present weakness and sensory symptoms in the legs that progress to the arms, cervical, and facial muscles. Approximately 20 % develop respiratory distress and require mechanical ventilation[4] in the intensive care unit (ICU) due to hypoxemia, alveolar edema, and pulmonary collapse, characteristic of respiratory distress syndrome (RDS).[5]

A study was conducted to manage a care plan to restore respiratory distress in a 2-year-old child in a public

pediatric institute in Lima, Peru. The AREA model was used to establish a structure that includes problems, focusing them on the expected results. This network helps to show relationships between diagnoses by using lines that explain their influence to find the key diagnosis and improve the nursing decision.[6]

CASE REPORT

A child with SDR, recurrent fever, GBS, nosocomial/aspirational pneumonia, with a history of cardiorespiratory arrest. Awake, with no relationship to his environment, with gastrostomy and tracheostomy, on mechanical ventilation with FiO2 60 %, marked polypnoea, snoring, wheezing, crackling and groaning, decreased cough reflex, mobilizes abundant transparent mucous secretions through the mouth and tracheostomy, chest x-ray: atelectasis in the lung bases, with flaccid quadriparesis.

Vital signs: temperature 38. 5°C, heart rate 132 beats per minute, respiratory rate 32 breaths per minute, blood pressure 81/55mmHg, SpO_2 98 %; arterial blood gas results: pH 7,31, pCO2 47,1 mmHg, NaHCO2 23 mEq/L, pO2 98 mmHg.

Laboratory tests: hemoglobin 8,60 mg/dl, Hto 26 %, leukocytes 13,32 X 103/uL, platelets 189X 103/uL, CRP 33,59 mg/dl, sodium 137,2 mmol/L, potassium 4,58 mmol/L, chlorine 100,7 mmol/L. Tracheal secretion culture: Pseudomonas aeruginosa.

Prescription: serum therapy, invasive mechanical ventilation, sedation and analgesia, infusion of inotropic, and empirical antibiotic therapy in the presence of a positive tracheal culture

Overall rating

Following Marjory Gordon's model, the dysfunctional patterns were health promotion, nutrition, exercise, and safety/protection.

Four NANDA-I diagnostic labels (DL) were identified: ineffective airway clearance, impaired spontaneous ventilation, hyperthermia, and ineffective protection.

Care planning and delivery

Based on the identified diagnostic labels (DL), the expected outcomes (EOS) and nursing interventions (NIs) are formulated according to taxonomy (table 1), and each indicator is assigned a quantitative value using the Likert scale.

Through the AREA model, ineffective airway clearance was identified as the main problem (figure 1).

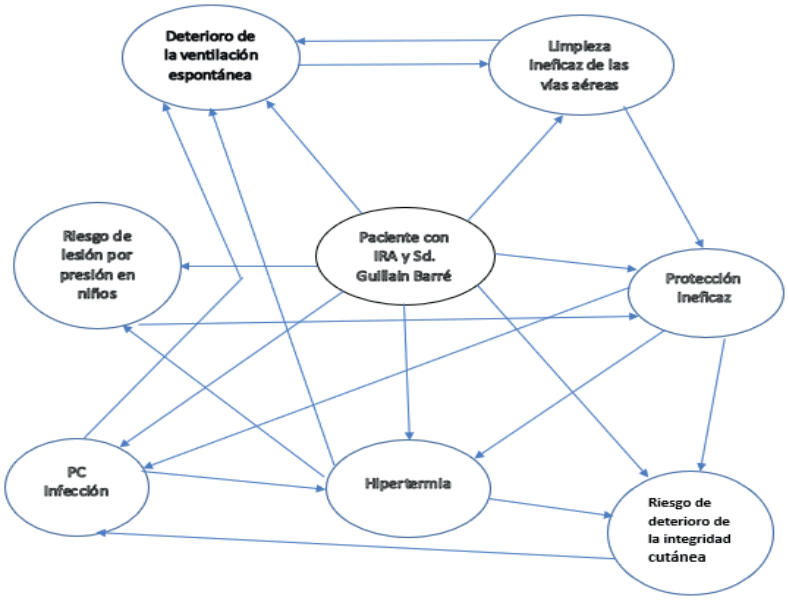

Figure 1. Clinical reasoning network of the AREA model

Evaluation of results/follow-up

The EDs and expected results were consistent. In ineffective airway clearance, the indicators considered reached the maximum value on the Likert scales (table 1); the ED deterioration of spontaneous ventilation reached a score of 4 (table 1), and the EDs of hyperthermia and ineffective protection obtained the maximum score.

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Table 1. Individualized care plan

Nursing diagnoses (NANDA-I)	Outcome indicator (NOC)	Likert scale		Interventions (NIC)	Nursing activities
		Initial score	Final score		
00031 Ineffective airway clearance	0410 Respiratory status: airway patency.			3160 Airway suctioning	Checking vital functions, placing in semi-Fowler's position, listening to respiratory sounds, nebulizing according to prescription, suctioning secretions on demand, checking and observing the color and quantity of secretions, reassessing vital signs
	041007 Pathological respiratory sounds[b]	2	5		
	041020 Accumulation of sputum[b]	1	5		
	041020 Acumulación de esputos[b]	1	5		
	0402 Respiratory status: gas exchange			3350 Respiratory monitoring	Evaluating chest movement, observing symmetry and use of respiratory muscles, monitoring saturation levels, auscultation to detect areas of decreased ventilation. Connecting ventilator alarms. Observe connections, temperature and humidification of inspired air, administer prescribed muscle paralyzing agents, sedatives and analgesics, empty condensed water from collectors, monitor progress with ventilator adjustments, oral hygiene and control of oral and nasal lesions.
	040209 Partial pressure of carbon dioxide in arterial blood[a]	3	5		
	040210 Arterial pH[a]	3	5		
	0403 Respiratory status: ventilation			3300 Management of invasive mechanical ventilation	
	040309 Use of accessory muscles[b]	1	4		
	040334 Atelectasis[b]				
00007 Hyperthermia	0800 Thermoregulation			3740 Treatment of fever	Control of temperature, vital signs, apply warm bath, lighten covers and appropriate clothing, observe skin color and temperature. Administer antipyretics and prescribed antibiotics, follow the rules for preparation and correct administration of medications, observe the permeability of the intravenous catheter before administering the medication, assess response to medication. Control fluid intake and output, and insensible losses.
	080001 Increased skin temperature[b]	2	5		
	080017 Apical heart rate[c]	2	5		
	080018 Hyperthermia[b]	2	5		
	2301 response to medication			2314 Administration of medication: intravenous	
	230101 expected therapeutic effects present[c]	2	5		
00286 ineffective protection	1004 Nutritional status			1100 Nutrition management	Determine nutritional status, calories and type of nutrients to meet nutritional needs. Administer polymer formula Weigh and measure, monitor hemoglobin results Verify transfusion order, obtain informed consent, corroborate blood group, Rh factor and compatibility tests on the blood package to be transfused, observe for warning signs during and after transfusion.
	100405 Weight/height ratio[a]	2	4	1160 Nutritional monitoring	
	1005 Nutritional status: biochemical determinations				
	100504 hemoglobin[a]	2	5	4030 Administration of blood products	

NIC: Nursing Interventions Classification; NOC: Nursing Outcomes Classification.
Qualitative value of Likert Scales:
[a] 1 (Serious deviation from the normal range) to 5 (No deviation from the normal range).
[b] 1 (Serious) to 5 (None).
[c] 1 (Severely compromised) to 5 (Not compromised).

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DISCUSSION

According to NANDA, ineffective airway clearance is the "inability to remove secretions or obstructions from the respiratory tract to keep the airways patent" (Herdman et al., 2021).; Cortes A., Che J., and Ortiz D.[7] point out that poor management of respiratory secretions contributes to disorders such as mucus plugging, obstructive atelectasis, etc. Jiménez E. et al.[8] affirm that excess and retention of secretions alters respiratory function and facilitates the appearance of infections. In the assessment, marked respiratory disorders were observed, the care for which was semi-Fowler's position, auscultation of respiratory sounds, nebulization according to medical prescription, aspiration of secretions on demand, care that coincides with the author García A. and García M.[9]

The deterioration of spontaneous ventilation, according to NANDA, is "the inability to initiate and/or maintain independent breathing for life support" (Herdman et al., 2021). Authors De la Peña - León, Dávalos Alcázar, and Valdez Labastida demonstrate that adequate respiratory monitoring detects danger signs in an early and timely manner. Otherwise, risk and integrity will be affected.[10] Given the defining characteristics: Connected to a mechanical ventilator, FiO2 60 %, with marked polypnoea, and moaning, the care was: auscultation and observation of symmetry, use of respiratory muscles, monitoring of O2 saturation.

Hyperthermia, according to NANDA, "is the state in which the body temperature rises above normal limits" (Herdman et al., 2021). "Hyperthermia is categorized as a body temperature above the normal range, which implies poor efficiency of thermoregulation of the body, which is not functioning correctly"[11] At a temperature of 38,5°C, tachycardia of 134 per minute, associated with the infectious process at the respiratory level, is controlled by the body's ability to lose heat in reaction to the thermostatic center in the hypothalamus.[12] In administering antipyretic medication and prescribed antibiotics (vancomycin and meropenem), the intravenous catheter's permeability prior to medication administration and response to medication is observed.

Ineffective protection, according to NANDA, is the "decreased ability to protect oneself from internal and external threats, such as illness or injury" (Herdman et al., 2021). "Inefficient immunological response against the installation and spread of cells and pathogens".[13] The defining characteristics coincide with the results found by Bernal, Flores, and Flores, who conclude that protection is related to hematological changes,[14] which, together with previous comorbidity, are risk factors for increasing the problem of respiratory failure.

Anemia resulting from inadequate nutrition negatively influences the general state of health and does not guarantee an adequate supply of oxygen to the tissues; hemoglobin is a main component of the immune system. Blood transfusion allowed an adequate level of Hb to be recovered.[15]

In the Model AREA analysis, the EDs about the comorbidities inherent to the health-disease process were identified. The patient presented with respiratory failure with a history of Guillain-Barré syndrome, a demyelinating disease causing flaccid paralysis of the respiratory muscles. The dysfunction of ineffective airway clearance has a cause-effect relationship with the dysfunction impairment of spontaneous ventilation; if the airway is filled with secretions, it prevents the entry and exit of air, and gas exchange is affected; spontaneous ventilation deteriorates due to fatigue of the respiratory muscles, the cough reflex, an important mechanism for clearing the airway, is also diminished. The Hyperthermia SD has a causal relationship with the SD deterioration of spontaneous ventilation, increasing respiratory work. SD risk of pressure injury in children and risk of deterioration of skin integrity would be causal by favoring skin moisture through perspiration, and with the SD ineffective protection, it has an effect relationship; fever is in response to infection. Both SEs also have an effect relationship with the ineffective protection of SE due to the patient's nutritional and immune conditions, which are ineffective in responding to any internal or external threat.

Ethical considerations

It was carried out after the informed consent was accepted, complying with the principle of privacy and respect for dignity.

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FINANCING

None.

CONFLICT OF INTEREST

None.

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