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CASE REPORT

Botulism in the ICU: Nursing care plan☆

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KEYWORDS
Botulism;
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Abstract
Introduction and case evaluation: Botulism is a rare disease in Europe, caused by the bacterium *Clostridium botulinum*, notifiable, non-transmissible person-to-person and potentially fatal (between 5% and 10%) if not treated quickly. The favorable opinion of the Clinical Research Ethics Committee was obtained. We present the nursing care plan of a 49-year-old man with a diagnosis of bacterial intoxication caused by *Clostridium botulinum*, secondary to ingestion of beans in poor condition, who was admitted to the ICU for a total of 35 days.
Diagnosis and planning: Holistic nursing evaluation during the first 24 h, with prioritisation of the systems that were deteriorating fastest: neurological and respiratory. Nine diagnoses were prioritised according to the NANDA taxonomy: risk for allergy response, ineffective breathing pattern, impaired oral mucous membrane, impaired physical mobility, risk for disuse syndrome, risk for dysfunctional gastrointestinal motility, impaired urinary elimination, risk for acute confusion and risk for caregiver role strain.
Discussion: The nursing care plan, standardised and organised with the NANDA taxonomy and prioritised with the outcome-present state-test (OPT) model, guaranteed the best care based on evidence, as the NOC scores improvement demonstrated. It was impossible to compare the nursing intervention with other case reports.

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PALABRAS CLAVE
Botulismo;
Bloqueo nervioso;
Cuidados críticos;
Atención de Enfermería

Botulismo en la UCI: proceso de cuidados

Resumen
Introducción y valoración del caso: El botulismo es una enfermedad poco frecuente en Europa, causada por la bacteria *Clostridium botulinum*, de declaración obligatoria, no transmisible de persona a persona y potencialmente mortal (entre un 5 y 10%) si no se trata rápidamente. Se obtuvo el dictamen favorable del Comité de Ética de Investigación Clínica. Se presenta el proceso de cuidados enfermero de un varón de 49 años con diagnóstico de intoxicación bacteriana por *Clostridium botulinum*, secundario a la ingesta de alubias en mal estado, que estuvo ingresado en la UCI un total de 35 días.
Diagnósticos y planificación: Valoración enfermera de forma holística durante las primeras 24 h, con priorización de los sistemas que presentaron un deterioro más rápido: el neurológico y el respiratorio. Se priorizaron 9 diagnósticos según la taxonomía NANDA: riesgo de respuesta alérgica, patrón respiratorio ineficaz, deterioro de la mucosa oral, deterioro de la movilidad física, riesgo de síndrome de desuso, riesgo de motilidad gastrointestinal disfuncional, deterioro de la eliminación urinaria, riesgo de confusión aguda y riesgo de cansancio del rol del cuidador.
Discusión: El proceso de cuidados enfermero, estandarizado y organizado con la taxonomía NANDA y priorizado con el método sistemático AREA, garantizó los mejores cuidados basados en la evidencia y prueba de ello fue la mejoría de las puntuaciones de los indicadores de resultado NOC. Resultó imposible comparar la actuación enfermera con la de otros casos documentados.

Introduction

Botulism is a disease caused by *Clostridium botulinum*, an anaerobic gram-positive bacillus formed by spores that produce a powerful neurotoxin.[1] It is notifiable, not transmissible person-to-person and potentially fatal (between 5% and 10%) if it is not treated promptly.[2]

The spores produced by the *C. botulinum* bacteria, which have been found in green beans, spinach, mushrooms, ham, sausages, tinned tuna and fish (fermented, salted and smoked[2]), germinate in anaerobic environments, and when they grow in certain environmental conditions create neurotoxins.[1,2] They are heat resistant (they can survive at more than 100 °C for 5 h or more, but if they are exposed to 120 °C for 5 min they are destroyed[1]). They do not develop in acid media (although a pH < 4.6 will not degrade an already existing neurotoxin[1]) and a low temperature and salt content can prevent their growth.[2]

C. botulinum is found all over the world and its growth depends on environmental factors.[3] Van Ermengem isolated the bacteria in 1897 from a badly-cured ham. Leuchs, in 1910, demonstrated that 2 strains of *C. botulinum* would produce toxins with different antigenicities and in 1919 Burke named them as type A and B, thus establishing their current alphabetical designations. Subsequently, 5 further types of toxins were discovered (C, D, E, F and G), some with dual toxicities.[4] Types A, B, E and occasionally F can cause human botulism; A is used cosmetically.[1–3]

There are 6 types of human botulism[1,2]: food-borne (through ingestion of foods contaminated during their preparation, processing or packaging[1–3]), infant (through ingestion of the spores that colonise the intestinal tract and release the toxin[1–3]), wound (generally due to injection of black tar heroin[1–3]), adult intestinal colonisation (the toxin is produced *in vivo* in the infected intestinal tract[1]), inhalation (very rare, as an act of bioterrorism[1,2]) and iatrogenic (through incorrect treatment[1]).

Between 2007 and 2015, cases of food botulism were notified in some countries in Europe and North America. According to the World Health Organisation, approximately 35% were serious, with a mortality rate of 15%, and the disease lasted from 5 to 180 days. The age mode was 50 (minimum age of 4 and maximum of 88) and 48% were males.[5] In Spain, according to the Carlos III Health Institute, the autonomous communities with the highest incidence of food botulism were Castile and Leon, Andalusia and Madrid, with 20, 15 and 10 cases, respectively, although they do not specify the severity.[6]

In food botulism the neurotoxins, created by the digestive enzymes after *C. botulinum* has been ingested, pass into the blood stream and interrupt the release of acetylcholine, causing a nerve block[1,2] and descending flaccid paralysis develops in the motor and autonomic nerves.[2] Symptoms appear between 12 and 36 h after ingestion and are principally neurological[2] and gastrointestinal[1,2]: fatigue,[2] neck muscle,[2] respiratory muscle[1,2] and lower limb weakness,[2] vertigo,[2] blurred vision,[1,2] diplopia,[1] drooping eyelids,[1] photophobia,[3] symmetric cranial neuropathy[2] (speech and swallowing difficulty and dry mouth), vomiting, diarrhoea, constipation and abdominal inflammation.[2]

Diagnosis is based on clinical history, physical examination[1] and confirmed by samples (faeces or wound, blood or food[2,3]). There will be no alterations in consciousness[1] or haemodynamic alterations, fever or sensory deficit.[2] Differential diagnosis will consider