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Femoral Nerve Injury during Neuroborreliosis — Nursing Care. Case Report

Uszkodzenie nerwu udowego w przebiegu neuroboreliozy — opieka pielęgniarska. Opis przypadku

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Abstract

Introduction. Neuroborreliosis is an insidious disease. It is often confused with other neurological diseases. Diagnosis is possible when the following are present: neurological symptoms indicative of neuroborreliosis, pleocytosis in CSF, and production of antibodies to Borrelia burgdorferi in CSF.
Aim. To assess the health situation and determine the nursing needs of a patient with femoral nerve damage during neuroborreliosis.
Case Report. A 31-year-old woman was admitted to the Department of Neurology as an elective patient. On the basis of the clinical picture, elevated levels of protein and lymphocytic cells in the examination of cerebrospinal fluid and the demonstrated intrathecal synthesis of antibodies against Borrelia diagnosed neuroborreliosis with damage to the left femoral nerve. Observation, interview, and analysis of medical records were used to identify nursing problems correctly. The scales used were: the NRS Rating Scale (pain intensity), Lovett Scale (muscle strength assessment), Hospital Anxiety and Depression Scale Questionnaire (a modified version of the HADS scale to assess anxiety and depression), AIS Scale (to assess insomnia), Baxter Scale (to monitor and assess the risk of complications associated with venous cannulation).
Conclusions. Dorothea Orem's nursing theory is appropriate for a patient with neuroborreliosis. The patient's main problems are: experiencing pain, difficulty in movement, and mental deterioration. The disease and related treatment and hospitalization influence bio-psycho-social deterioration. Holistic nursing management should be adapted to the patient's changing condition. Care includes activities aimed at nullifying the effects of the disease, providing emotional support, and education regarding proper rehabilitation management and prevention of Lyme disease.
(JNNN 2022;11(4):174–179)
Key Words: femoral nerve, neuroborreliosis, nursing care

Streszczenie

Wstęp. Neuroborelioza jest chorobą podstępną. Jest często mylona z innymi chorobami neurologicznymi. Rozpoznanie jest możliwe w sytuacji, gdy występują: objawy neurologiczne wskazujące na neuroboreliozę, pleocytoza w płynie mózgowo-rdzeniowym, produkcja przeciwciał przeciwko Borrelia burgdorferi w płynie mózgowo-rdzeniowym.
Cel. Ocena sytuacji zdrowotnej i określenie potrzeb pielęgnacyjnych pacjentki z uszkodzeniem nerwu udowego w przebiegu neuroboreliozy.
Opis przypadku. 31-letnia kobieta została przyjęta w trybie planowym do Kliniki Neurologii. Na podstawie obrazu klinicznego, podwyższonego poziomu białka i komórek limfocytarnych w badaniu płynu mózgowo-rdzeniowego oraz wykazanej intratekalnej syntezie przeciwciał przeciwko Borrelii rozpoznano neuroboreliozę z uszkodzeniem lewego nerwu udowego. W celu właściwego określenia problemów pielęgnacyjnych posłużono się obserwacją, wywiadem oraz analizą dokumentacji medycznej. Zastosowano skale: NRS Rating Scale (natężenie bólu), skalę Lovetta (Ocena siły mięśniowej), Kwestionariusz Szpitalnej Skali Lęku i Depresji (zmodyfikowana wersja skali HADS, do oceny lęku i depresji), Skalę AIS (ocena bezsenności), skalę Baxtera (monitorowanie i ocena ryzyka powikłań związanych z kaniulacją żył).

Wnioski. Teoria pielęgnowania Dorothei Orem jest odpowiednia w przypadku pacjentki z neuroboreliozą. Główne problemy chorej to: odczuwanie bólu, trudności w poruszaniu się oraz pogorszenie stanu psychicznego. Na pogorszenie stanu bio-psycho-społecznego wpływa choroba oraz związane z nią leczenie i hospitalizacja. Holistyczne postępowanie pielęgniarskie powinno być dostosowane do zmieniającego się stanu zdrowia pacjentki. Opieka obejmuje działania mające na celu niwelowanie skutków choroby, udzielanie wsparcia emocjonalnego, edukację odnośnie prawidłowego postępowania rehabilitacyjnego oraz profilaktyki boreliozy. **(PNN 2022;11(4):174–179)**
Słowa kluczowe: nerw udowy, neuroborelioza, opieka pielęgniarska

Introduction

Neuroborreliosis is an insidious disease that does not produce typical symptoms. It is often confused with other neurological diseases. For example, Lyme spirochetes can reside in the central nervous system for months or even years and produce no symptoms [1]. The European Federation of Neurological Societies (EFNS) indicates that a diagnosis of neuroborreliosis is possible when the following are present: neurological symptoms that indicate neuroborreliosis; when pleocytosis is found in the cerebrospinal fluid; when there is a production of antibodies to Borrelia burgdorferi in the CSF [2]. The infection usually has a severe course. Specialized assistance is required. In almost 100% of cases, hospitalization is required [3,4].

This study aims to assess the health situation and evaluate the nursing needs of a patient hospitalized for femoral nerve damage in the course of neuroborreliosis.

Case Report

A 31-year-old woman was admitted to the Department of Neurology as an elective patient with worsening weakness in her left lower extremity. The weakness was accompanied by numbness in the left foot, weakened sensation in the inner part of the lower leg, and burning muscle pain in the lower and upper extremities. The respondent did not remember being bitten by a tick. In addition, she did not observe the onset of erythema migrans.

Neourographic examination showed a decrease in the femoral nerve fiber response amplitude on the left side. A pelvic MRI showed a thickening of the femoral nerve in the iliac portion. Elevated levels of IgG and IgM antibodies to Borrelia showed laboratory tests.

Observation, interview, and analysis of medical records were used to identify nursing problems correctly. Scales used were: NRS Rating Scale (pain intensity), Lovett scale (assessment of muscle strength), Hospital Anxiety and Depression Scale Questionnaire (modified version of HADS scale to assess anxiety and depression), AIS Scale (assessment of insomnia), Baxter scale (monitoring and assessment of the risk of complications associated with venous cannulation).

On physical examination, the patient was conscious and maintained logical, verbal contact. She had no meningeal symptoms. Strength weakness was observed in the proximal part of the left lower limb with weakness of flexion at the knee joint. The patient scored three on the Lovett scale. No other features of focal nervous system damage were observed. Neurography examination showed mainly demyelinating damage, left femoral nerve with active denervation of the left thigh muscles, and mediocre lumbosacral root lesions. On electroencephalographic examination, the recording was within normal limits. On magnetic resonance imaging of the pelvis, an image consistent with inflammatory lesions of the left femoral nerve was observed, with features of denervation of the supplied muscles in the subacute phase. Cerebrospinal fluid examination showed elevated cellularity with a predominance of lymphocytic cells, and elevated protein levels were noted. In addition, there was an intrathecal synthesis of antibodies to Borrelia in the IgM class and high titers of antibodies in the IgG class in the cerebrospinal fluid.

Due to prolonged antibiotic intake and other pharmacotherapy and intravenous fluids, the patient developed frequent inflammation in the cannulated peripheral veins. At the time of the interview, the peripheral venipuncture was rated at three on the Baxter scale. This indicated vein inflammation and the need to change the insertion site.

After the second lumbar puncture, the patient developed very severe post-puncture headaches. In addition, the patient had nausea and dizziness. The pain lasted for five days without any chronicity.

On the day of the nursing process, the patient was auto and allopsychically oriented. The patient had difficulty accepting the health situation. The lengthy hospitalization exacerbated homesickness and family. Emotional problems, anxiety, irritability, fear, and nervous tension appeared. The patient scored 18 on the AIS scale, indicating a high probability of insomnia. Anxiety and depression levels were assessed using the HADS questionnaire. In the anxiety category, the patient scored 15 points. In the depression category, she scored 12 points, which is an abnormal score. In the aggression

subscale, she scored 6 points, which can be considered a borderline score.

A 31-year-old woman was diagnosed with neuroborreliosis with damage to the left femoral nerve based on her clinical picture, elevated protein and lymphocytic cells on CSF examination, and demonstrated the intrathecal synthesis of antibodies to Borrelia.

Essential nursing diagnoses and appropriate nursing actions are formulated:

Problem 1: Left Lower Limb Pain due to Femoral Nerve Damage

Purpose of nursing care: To reduce pain.
Nursing interventions [5,6]:

1. Assessment of pain intensity using the NRS scale at fixed times of the day, for example, during routine nursing activities.
2. Obtaining information on pain-relieving methods previously used by the patient.
3. Suggesting that the patient keep a pain assessment diary (duration, factors increasing and decreasing pain).
4. Explaining the principles of pain treatment (pharmacological and non-pharmacological methods), informing about possible side effects, emphasizing the importance of immediate reporting of treatment failure.
5. Education on the possibility of effective pain control, harmful effects of persistent, unrelieved pain.
6. Administration of pharmacological agents (on doctor's orders) and assessment of pain intensity, encouraging the use of non-pharmacological ways to relieve pain.
7. Advise the patient to avoid staying too long in one position, avoid fatigue, cold, sleeplessness, abandon rehabilitation exercises when the patient is in severe pain.

Assessment: Reduction in pain from 6 to 3 on the NRS scale, greater patient comfort.

Problem 2: Discomfort from Severe Headache and Nausea due to Post-puncture Syndrome after a Follow-up LP

Purpose of nursing care: To improve patient comfort by reducing perceived discomfort.
Nursing interventions [7–11]:

1. Assessing pain intensity using the NRS scale, at fixed times of the day, e.g. during routine nursing activities.
2. Define, during a conversation with the patient, pain-relieving methods based on her previous experience.
3. Explain to the patient the principles of pain treatment (pharmacological and non-pharmacological methods), possible side effects, and the importance of immediately reporting treatment failure.
4. Educate her on the possibility of effective pain control, harmful effects of persistent, unrelieved pain.
5. Administer pain-relieving pharmacological agents (on doctor's orders) and assess pain intensity.
6. Encouraging the use of non-pharmacological ways to relieve pain, such as visualization, relaxation, application of heat or cold.
7. Finding the most comfortable position where pain is least.
8. Proper hydration of the patient, encouraging oral fluid intake, intravenous fluid therapy as ordered by the doctor.
9. Providing hygienic measures in case of vomiting.
10. Distraction from nausea with music therapy, reading a book, watching movies.
11. Consuming ginger in a form convenient for the patient (tea, candies, lozenges).
12. Drinking strong coffee.

Assessment: Headache decreased slightly; on the NRS scale, from 6 to 4 in the supine position and from 8 to 7 during upright standing. Nausea has decreased significantly. Nausea is no longer a cause of discomfort.

Problem 3: Loneliness is Associated with Social Isolation as a Result of Lengthy Hospitalization

Purpose of nursing care: Reduction of negative emotions caused by loneliness, strengthening social contacts.
Nursing interventions [12–15]:

1. Determining how the patient perceives loneliness.
2. Determining what are the patient's ability, willingness, and capacity to meet the need for social integration.
3. Enabling contact with family and friends.
4. Using the computer and internet for social contact.
5. Suggesting and enabling contact with another patient of similar age and interests.
6. Helping the patient to increase awareness of her strengths and limitations in communication.
7. Not judging the patient, allowing the patient to express negative emotions, engaged listening.
8. Encouraging the maintenance of already established relationships.
9. Paying attention to the patient's emotional state.

10. Showing empathy, understanding, and kindness.
11. Referring the patient to a psychologist.

Assessment: The patient contacts her family more often and feels less lonely. She spends evenings with another patient.

Problem 4: Feelings of Anxiety, Hopelessness, Fear for the Future

Purpose of nursing care: To help people accept their illness, motivate them to become active, and improve their mental state.

Nursing interventions [5,12,14]:

1. Identify effective and ineffective methods of coping with anxiety, helping the patient objectively evaluate events, and supporting the patient.
2. Clarifying any doubts about the condition.
3. Using verbal and non-verbal modes of communication characterized by empathy, active listening, and confrontation.
4. Encouraging the expression of emotions.
5. Helping to identify fears and problems.
6. Setting goals.
7. Supporting lifestyle modification to reduce stress, conducting an assessment using the HADS scale.
8. Suggesting psychological support.
9. Paying attention to the patient's deteriorating emotional state.

Assessment: The patient reported increased psychological comfort and declared a desire for psychological help.

Problem 5: Difficulty Walking due to Paresis of the Left Limb due to Femoral Nerve Damage

Purpose of nursing care: To improve mobility and prevent falls.

Nursing interventions [12,14]:

1. Assessment of the patient's level of disability.
2. Consulting a physiotherapist to teach a safe way to move and demonstrate self-care exercises.
3. Helping the patient learn to walk appropriately under the supervision of a nurse.
4. Using crutches for mobility and encouraging the patient to engage in activities.
5. Advising the patient to use appropriate athletic shoes for walking around the hospital.
6. Participating in rehabilitation activities.

Assessment: The patient moves independently around the hospital and does not fall.

Problem 6: The Patient's Discomfort due to Increased Itching of the Skin, Chills, and High Fever, which are Symptoms of Herxeimer's Reaction

Purpose of nursing care: To reduce skin discomfort and decrease temperature and chills.

Nursing interventions [16,17]:

1. Assessing the skin lesions, recording the extent and locations of the rash and keeping the skin dry, aerating the skin, informing the patient about the need to keep the skin clean, and not overheating the skin during bathing, wearing light, airy cotton clothing by the patient.
2. Informing the patient of the need to perform skin care gently, do not rub or irritate the skin.
3. Recommend the use of moisturizers and emollients immediately after bathing.
4. Administration of antihistamines on doctor's orders.
5. Use of cooling treatments: cooling compresses at 10–15°C on the forehead and chest.
6. Ensuring an appropriate microclimate in the room: ventilating and maintaining a temperature of 16–19°C, administering lukewarm fluids.
7. Monitoring body temperature. If necessary, monitor blood pressure, pulse, and respiration. They were administering fever-reducing drugs as prescribed by the doctor.
8. Informing the patient of the possibility of the following symptoms: stiffness, nausea and vomiting, headache, increased respiratory rate, faster heartbeat, hot flashes, muscle aches, and exacerbation of skin lesions, and the need to inform the nurse if the mentioned symptoms are noticed.

Assessment: The body temperature has decreased to 37.5°C. The rash persists, but the itching is less bothersome.

Problem 7: The Patient's Anxiety about Frequent Changes in the Peripheral Insertion Site

Purpose of nursing care: To keep the vascular line free of signs of infection until the end of intravenous treatment.

Nursing interventions [18,19]:

1. Obtain vascular access using a midline indirect puncture. Changing the transparent fixation dressing every 5 to 7 days.
2. Changing the gauze dressing every two days and after any soiling.
3. Observation of the puncture site (for inflammatory changes).
4. Evaluation of the puncture once a day using the Baxter scale.
5. Educate the patient about the infusion therapy being administered — the purpose and possible

complications, as well as the principles of self-care over the infusion.

Assessment: The patient is calmer because the puncture has no signs of inflammation.

Discussion

According to Zajkowska and Drozdowski [20], early neuroborreliosis is dominated by cranial neuropathies, painful nerve root inflammation, and meningitis (Bannwarth's triad). In the case described here, only nerve root inflammation occurred. The pain increased at night. Recommendations say that antibiotic treatment should last 14–28 days. The lengthy hospitalization of patients should be considered when taking care of the patient from the first day of hospitalization.

In the care of the described patient, three areas can be distinguished:

1. Problems resulting from nerve damage and the course of neuroborreliosis (mobility problems, pain in the limb, paresthesias).
2. Problems arising from the implemented treatment (post-puncture syndrome, Herxheimer reaction, inflammation at the peripheral injection site).
3. Problems associated with lengthy hospitalization (lowered mood, loneliness, anxiety).

Zajkowska et al. note sleep disturbances and emotional lability among patients with neuroborreliosis. Fatigue occurs in about 94% of patients with Lyme disease and mood disorders in 84% of patients. Memory disorders are observed in 83% of patients. Symptoms of encephalopathy are common in neuroborreliosis. These symptoms affect sleep problems and fatigue. Mental disorders may be a consequence of chronic disease rather than a direct result of the inflammatory process in the nervous tissue [21]. A study by Eikeland et al. shows that patients with neuroborreliosis, even after treatment is over, exhibit a reduced quality of life that is associated with poor health. Patients experience more fatigue than healthy individuals [22].

Conclusions

1. Dorothea Orem's nursing theory is appropriate for a patient with neuroborreliosis.
2. The patient's main problems were pain, mobility difficulties, and mental deterioration.
3. The deterioration of the bio-psycho-social condition is affected by both the disease and the associated treatment and hospitalization.
4. Holistic nursing action should be adapted to the patient's changing condition.
5. Care includes activities aimed at nullifying the effects of the disease, providing emotional support, and education on proper rehabilitation management and prevention of Lyme disease.
6. Rehabilitation should include, among other things, learning to walk correctly, strengthening the muscles of the affected limb, and restoring proper function of the quadriceps muscle of the thigh.

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