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CASE REPORT

The Rehabilitation Nurse's Intervention in People with Spasticity: Case Report

Intervención de la enfermera de rehabilitación en personas con espasticidad: Informe de un caso

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ABSTRACT

Introduction: stroke is one of the main causes of disability and mortality in Portugal. Early rehabilitation is essential to reduce complications such as spasticity, improve functionality and acilitate home reintegration.
Case report: case report based on rehabilitation nursing interventions, following the Case Report guidelines. A home rehabilitation program was implemented for a 50-year-old client with spastic left hemiparesis. Muscle strength, spasticity and pain were assessed using validated scales such as the Modified MRC Scale and the Ashworth Scale. The intervention plan included passive and active-assisted mobilizations, transfer exercises and teaching the caregiver. There was a slight improvement in muscle strength and spasticity, but no impact on functional independence, according to the Barthel Index.
Conclusions: early intervention and continuous monitoring by a Rehabilitation Nurse Specialist were fundamental to improving muscle strength and reducing spasticity. Caregiver training played a crucial role in implementing the care plan.

Keywords: Stroke; Rehabilitation; Nursing; Spasticity.

RESUMEN

Introducción: el ictus es una de las principales causas de discapacidad y mortalidad en Portugal. La rehabilitación precoz es fundamental para reducir complicaciones como la espasticidad, mejorar la funcionalidad y facilitar .la reintegración en el hogar.
Informe de caso: reporte de caso basado en intervenciones de enfermería de rehabilitación, siguiendo las guías Case Report. Se implementó un programa de rehabilitación domiciliaria para un cliente de 50 años con hemiparesia izquierda con patrón espástico. La fuerza muscular, la espasticidad y el dolor se evaluaron con escalas validadas como la Escala MRC Modificada y la Escala Ashworth. El plan de intervención incluyó movilizaciones pasivas y activas asistidas, ejercicios de transferencia y entrenamiento de cuidadores. Se observó una ligera mejoría en la fuerza muscular y la espasticidad, pero no hubo impacto en la independencia funcional, según el índice de Barthel.

Conclusiones: la intervención temprana y el seguimiento continuo por parte de una Enfermera Especialista en Enfermería de Rehabilitación fueron esenciales para mejorar la fuerza muscular y reducir la espasticidad. El empoderamiento de los cuidadores jugó un papel crucial en la implementación del plan de atención.

Palabras clave: Accidente Cerebrovascular; Rehabilitación; Enfermería; Espasticidad.

INTRODUCTION

Stroke is the leading cause of death and disability in Portugal, accounting for approximately 7,7 % of the cases.[1] A stroke can be caused by occlusion (ischemic stroke) or rupture (hemorrhagic stroke) of a cerebral artery. Effective treatment is most beneficial within the first hours after the onset of symptoms.[2] Cerebrovascular and cardiovascular diseases are the main cause of death, and Portugal is among the eight European countries with the highest mortality rate.[3]

Flaccidity is the first manifestation of stroke, characterized by the absence of voluntary muscle movement. Later, over time, it is usually transitions into hypertonia, leading to increased resistance to passive movement, commonly associated with spastic patterns. Spasticity contributes to serious complications, such as muscle contractures, reduced range of movement and inappropriate postures, increasing the client's dependency and the need for special care by a Rehabilitation Nurse Specialist (RNS).[3] It is estimated that approximately one third of individuals who survive a stroke develop spasticity during the first year after the event.[4]

Spasticity, the prevalence of which varies between 66 % and 79 % of the upper limbs, and 30 % and 80 % overall, appears progressively weeks or even months after a stroke.[5,6] Without intervention, it can become a chronic condition, making its early detection and treatment essential for minimizing functional limitations and preserving the client's autonomy and quality of life, with rehabilitation being one of the fundamental aspects of recovery after a stroke.[5,6]

This case report was prepared in accordance with Equator's CAse REport (CARE) guidelines and aims to describe the benefits associated with the early start of a rehabilitation program for people with stroke, focusing on the management of spasticity.

CASE REPORT

Mrs. N., 50 years old, resident in Angola since birth and in Portugal since March 2023 (where she was evacuated after her ischemic stroke). She lives in an apartment on the 4th floor with an elevator, but with stairs to the lower level and stairs to access the street. Both do not have ramps. At home, she lives with her 24-year-old daughter, who works part-time and is her main carer. She also has the help of a relative when her daughter is not there, who also lives in the apartment. All trips outside the home are made by the fire department (only for appointments). Her personal history is hypertension, but she does not take her medication. She was left with permanent sequelae of hemiparesis of the left upper and lower limbs, both in a spastic pattern.

In a rehabilitation program since January 2024, she began sessions with the rehabilitation nursing team at the Community Care Unit (CCU) in May of that same year. Sessions twice a week, about 45 minutes, focusing on self-care, transfers. Client dependent in all his activities of daily living (ADLs), where the emphasis in the rehabilitation sessions was on maximizing potential and reducing the caregiver's fatigue/strain.

The data collection instruments available from the Order of Nurses[7] and the ontology were used to collect data and make nursing diagnoses:

- Barthel Scale to assess the degree of dependence in ADLs.
- Modified MRC Scale to assess muscle strength.
- Modified Ashworth Scale to assess spasticity.
- Numerical pain scale.

Table 1 shows the rehabilitation intervention plan, including the diagnosis, the objective and the interventions put in place.

The motor rehabilitation plan was carried out for 3 weeks, twice a week, lasting around 45-60 minutes. The plan included self-mobilizations, passive mobilizations in an anti-spastic pattern of all the joints of the left upper and lower limb, muscle strength and endurance (standing, lifting and sitting), as well as transfers (bed, wheelchair and from the wheelchair to the sofa/chair at the end of the session). Since the program was implemented, there has been a slight improvement in muscle strength, spasticity and pain levels. However, this improvement was not reflected in functional independence. The following figures (figure 1 and figure 2) show the evolution of muscle strength and spasticity, respectively, during the rehabilitation program.

Table 1. Rehabilitation nursing intervention plan

Focus/Diagnosis	Objective	Intervention
Left hemiparesis	- Determine the evolution of muscle strength -Improve muscle strength; -Promote adherence to muscle-joint exercise regimen	- Perform a passive muscle and joint exercise technique [in a spasticity-inhibiting pattern, in a distal-proximal direction, respecting the pain threshold and joint amplitude, as well as the axes of all joints] - 2 sets of 10 repetitions; - Perform active-assisted muscle and joint exercise technique [seated in armchair, positioned hemi-body]. - Instruction in muscle and joint exercise techniques [self-mobilization technique for the left hemibody (upper limb: interlock hands with arm in extension, raise it above the head, obtaining prostration of the shoulder; interlock hands and raise them towards the left shoulder, right shoulder in extension and flexion of the elbow; lower limb: place the affected leg on top of the unaffected leg and promote flexion and extension)]. - 2 sets of 10 repetitions; - Training muscle and joint exercise techniques [self-mobilization technique for the left hemibody (upper limb: interlacing the hands with the arm in extension, raising it above the head and obtaining prostration of the shoulder; interlacing the hands and raising them towards the left shoulder, right shoulder extension and elbow flexion; lower limb: placing the affected leg on top of the unaffected leg and promoting flexion and extension)]. - 2 sets of 10 repetitions; - Sit and stand exercise - gradual increase [1 set of 5 repetitions; 2 sets of 5 repetitions] - Monitor muscle strength using the modified MRC scale.
Spasticity	- Determine the evolution of muscle tone; -Avoid worsening of spasticity; - Promote client and caregiver adherence to muscle and joint exercise regimens; - Promoting the caregiver's role: adherence to anti-spastic positioning.	- Monitor spasticity using the modified Ashworth scale; - Perform passive muscle and joint exercise technique [in a spasticity-inhibiting pattern, in a distal-proximal direction, respecting pain threshold and joint amplitude, as well as axes of all joints] - 2 sets of 10 repetitions. - Perform active-assisted muscle and joint exercise technique [seated in armchair, positioned hemi-body]. - Perform massage; [after each session with hot towel] - Evaluate evolution of caregiver's role: adherence to muscle-joint exercise regimen; [Caregiver asked to demonstrate] - Teach about positioning technique in spasticity inhibitory pattern [Demonstrated to caregiver] - Evaluate the evolution of the caregiver's role: adherence to positioning in an anti-spastic pattern. [Caregiver asked to demonstrate]

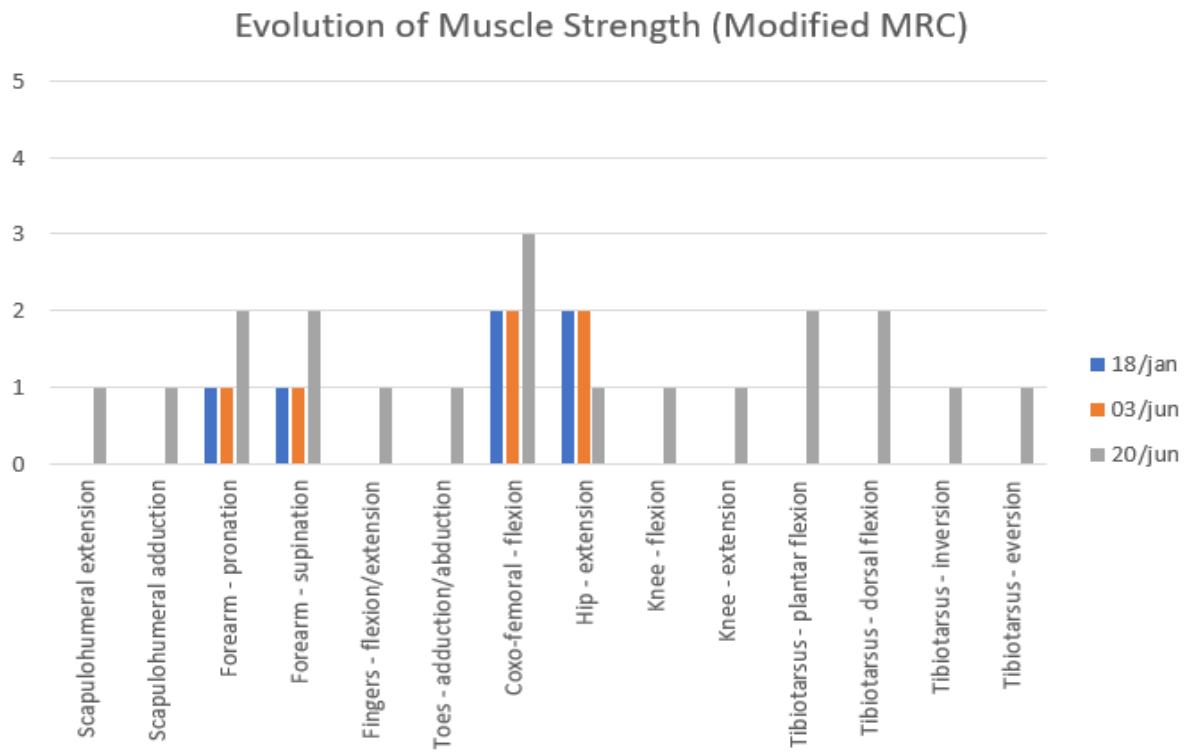

Figure 1. Evolution of Muscle Strength

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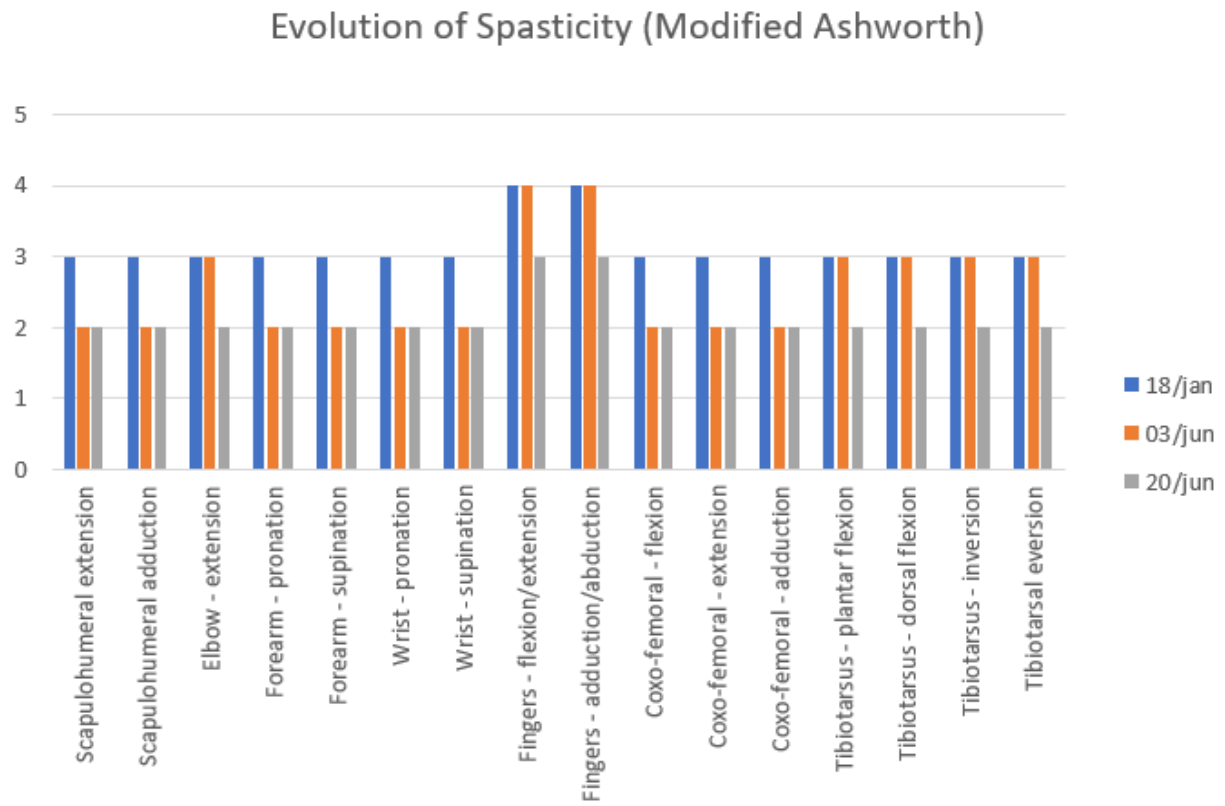

Figure 2. Evolution of Spasticity

DISCUSSION

For there to be a favorable outcome in terms of the functional capacity of the person with a stroke, early rehabilitation must be present, so that they can return home as soon as possible, by means of an intervention aimed at risk factors, prevention of complications, treatment of comorbidities and the development of an appropriate discharge plan together with the family and/or relative of reference. The rehabilitation program must include exercises that contribute to muscle strength, always taking into account the client's motivation and the type of muscle contraction present. Early mobilization, balance training, ergonomic training, caregiver-guided exercises, anti-spastic positioning and self-mobilization are some examples of successful rehabilitation.[8]

Early rehabilitation is an asset for preventing spasticity, but some factors can compromise recovery. The more severe the injury, the greater the likelihood of developing spasticity, individual factors must also be considered since each individual responds to rehabilitation differently, and finally there are other secondary complications such as contractures or deformities that develop over time which can compromise the whole process.[9] According to a 2021 study, recognizing and addressing spasticity risk at an early stage can enhance physical function, foster independence, and elevate the overall quality of care. Regular assessments enable timely intervention, helping patients avoid long-term complications—an especially crucial factor for those with severe impairments or limited access to specialized care. Although there is ongoing debate regarding whether stroke recovery reaches a plateau after a certain period, long-term and delayed therapy can still enhance patients' functional status.[10]

Caregiver training is essential to improve client care, but this training must be validated over time, which in this case proved crucial as the caregiver admitted that she was not aware of the antispastic pattern.[11]

Pain is often associated with contractures related to spasticity, so joint mobilization, cervical stretches and massages are fundamental for improving this complication.[12]

One of the factors that may have contributed to the improvement in a short time may be related to the empathy between client and health professional. Empathy has a positive therapeutic effect, favorably boosting treatment through the development of mutual respect and uniqueness, respect for the client's culture, beliefs and values.[11] The therapeutic nurse-client relationship also improves quality of life and enhances the resolution of daily problems, helping with independence and self-care.[13]

When there is no significant improvement, the client may show demotivation and an increase in negative emotions, which was seen during this process, ultimately hindering the rehabilitation plan.[14]

As far as the Barthel index is concerned, there was no improvement, since the change shown was in terms of muscle strength, where transfers became easier for the caregiver, but this does not translate into a score

and/or degree of dependence.

CONCLUSION

This case report has highlighted the importance of early intervention in rehabilitation nursing for people with strokes in improving strength, reducing spasticity and reducing pain. It was also possible to increase the knowledge of the person and informal caregivers, through teaching and its validation over time. The RNS's intervention in a home context is fundamental for maintaining physical exercise so as not to lose mobility.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

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