Functional Neurorehabilitation in Grade 0 Paraplegic Patients

Ângela Martins (DMV, CCRP, EASVS, member of AARV and IARVT), Bruno Melo (DMV)

Introduction

Functional neurorehabilitation (FNR) enhances the neurological evolution of grade 0 paraplegic patients (G0PP), according to Frankel’s modified scale, as it allows to regain voluntary movement, or to acquire an involuntary movement similar to normal gait.

Materials and Methods

Twenty-nine patients underwent a FNR consultation, where they were classified as G0PP. In all cases, the disease was diagnosed using imaging methods such as radiography, myelography, CT or MRI. All patients were hospitalized and underwent a FNR protocol composed by:

- **Kinesiotherapy:**
  - **Passive Postural Standing** (It was prescribed 4 to 6 daily sessions of 4 to 6 minutes)
  - **Withdrawal Reflex** (It was prescribed 4 to 6 daily sessions of 30 repetitions per session)
  - **Bicycle Movement Exercise in Balance Disc** (It was prescribed 4 to 6 daily sessions of 30 repetitions per session)

- **NMES:** Applied to all patients with hypotonic semimembranosus and semitendinosus muscles. The technique used was the segmental, where an electrode should be placed in the sciatic nerve root (L6 – S1) and the other electrode on the motor unit of the flexor muscles (It was prescribed 2 sessions per week)

- **Hydrotherapy:** Hydrotherapy was used under the form of underwater treadmill. Due to the properties of water, both voluntary and involuntary movements are facilitated and enhanced. (It was prescribed, initially, 6 weekly sessions of 3 minutes at 1 km/h, with the water line at the level of the greater trochanter of the femur. Weekly, were increased in 10 to 25% both speed and exercise time)

- **Treadmill:** Whenever the patients had voluntary or involuntary movement in the water and if not suffering from degenerative joint diseases, assisted bicycle movement exercises were preformed on the treadmill. (It was prescribed initially 6 weekly sessions of 3 minutes at 1 km/h. Weekly, were increased in 10 to 25% both speed and exercise time)

- **Pain Management:** Rehabilitation modalities with analgesic properties were applied when patients had muscle pain.
  - **TENS:** The technique used was the segmental, where an electrode should be placed in the femoral nerve root (L4 – L6) and the other electrode on the motor unit of the extensor muscles. (It was prescribed 1 daily session until absence of pain
  - **Lasertherapy:** Laser therapy was performed with a class IV laser. (It was prescribed a daily session for 3 days, followed by one session every 48 hours for 1 15 days and then one session every 72 hours until absence of pain)
  - **Relaxation Massage:** The massage was performed on the quadriceps femoris and sartorius, and it consisted in the application of the following massage techniques by order: Stroking - Effleurage - Wrining-Up - Kneadings - Thumbs - Friction - Wrining - Effleurage - Stroking. (It was prescribed one to two daily sessions until absence of pain)

Results

After statistical analysis, it was not found relation between gender, breed, age or type of disease and the recovery of the deep felling sensation (DFS). It was found relation between, the time between the first approach and CRAA admission and the DFS at CRAA discharge, and also, with the time of FNR.

![Graph showing DFS at HVA discharge](image)

**Time Between the First Approach and HVA Admission**

- **DFS at HVA discharge**
  - Absent
  - Present

- **Time Between First Approach and HVA Admission**
  - < than 8 days
  - > than 15 days

- **Time of Functional Rehabilitation**
  - < than 1 month
  - 1 to 3 months
  - 3 to 6 months
  - > than 6 months

Conclusion

It was concluded that the success of FNR in the recovery of DFS is directly related to the time period between the 1st approach and the beginning of rehabilitation, and also, that the sooner patients start rehabilitation, less time it is required to consider them rehabilitated, so the rehabilitation protocol should be initiated as early as possible, contradicting the rest period described by various authors.

References


