



HAL
open science

Risk Analyses of Pressure Ulcer in Tetraplegic Spinal Cord-Injured : A French Long-Term Survey

Marc Le Fort, Maude Espagnacq, Brigitte Perrouin-Verbe, Jean-François Ravaud

► **To cite this version:**

Marc Le Fort, Maude Espagnacq, Brigitte Perrouin-Verbe, Jean-François Ravaud. Risk Analyses of Pressure Ulcer in Tetraplegic Spinal Cord-Injured : A French Long-Term Survey. Archives of Physical Medicine and Rehabilitation, 2017, 98 (10), pp.e105. <10.1016/j.apmr.2017.08.338>. <hal-03966625>

HAL Id: hal-03966625

<https://hal.science/hal-03966625v1>

Submitted on 31 Jan 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons CC BY-NC-ND 4.0 - Attribution - Non-commercial use - No Derivative Works - International License

needed. Participants had a notable deviation in spatiotemporal aspects of gait (asymmetry or significantly reduced speed) and were hemiparetic or ataxic.

Interventions: RAS was delivered in the form of preferred music with an additional rhythmic click. Participants listened on headphones.

Main Outcome Measure(s): A Diary of Adverse Events was completed daily during intervention to determine safety. The number of people to complete the study determined feasibility. Cadence, velocity, stride length, single support time and double support time were measured by the GAITRite. The Functional Gait Assessment (FGA) measured functional gait.

Results: Rhythmic Auditory Stimulation is a safe and feasible intervention for individuals with a TBI that yields changes in gait.

Conclusion/Discussion: More research on RAS is needed to determine the efficacy with the TBI population.

Key Words: Traumatic Brain Injury, Music Therapy, Gait, Gait Disorders

Disclosures: Nothing to disclose.

Research Poster 304576

Risk Analyses of Pressure Ulcer in Tetraplegic Spinal Cord-Injured : A French Long-Term Survey



Marc Le Fort (University Hospital Nantes (France)), Maude Espagnacq, Brigitte Perrouin-Verbe, Jean-François Ravaut

Research Objectives: To identify the long-term clinical, individual, and social risk factors for the development of pressure ulcers (PUs) in traumatic spinal cord-injured persons with tetraplegia (TSCI).

Design: Cohort survey with self-applied questionnaires in 1995 and 2006.

Setting: Thirty-five French-speaking European physical medicine and rehabilitation centers participating in the Tetrafigap surveys.

Participants: A total of 1641 tetraplegic adults were surveyed after an initial post-traumatic period of at least 2 years. Eleven years later, a follow-up was done for 1327 TSCI, among whom 221 were deceased and 547 could be surveyed again.

Interventions: Not applicable.

Main Outcome Measure(s): The proportion of PUs documented at the various defined time points, relative to the medical and social situations of the TSCI, by using univariate analyses followed by logistic regression.

Results: Of the participants, 73.4% presented with a PU during at least one period after their injury. Four factors had a proper effect on the occurrence of PU at the long term. On the one hand, a protective feature for this population, persons with incomplete motor impairment (OR = 0.5) and moreover those who were able to walk (OR = 0.2); on the other hand, a strong pre-dictive factor was the development of a PU during the initial post-trauma phase (OR = 2.7). Finally, a significant situational factor was the lack of social network (OR = 3.1).

Conclusion/Discussion: We believe that the highlighting of a motor incomplete feature of SCI (protective for the development of PU) and of a medical risk factor, an early PU (which served as a definitive marker of the trajectory of TSCI), together with a social situational factor, indicates the crucial role of initial management and of long-term follow-up.

Key Words: Risk Factor, Cohort Study, Recurrence, Questionnaire, Follow-Up Study

Disclosures: None.

Research Poster 309759

Robot-Assisted Gait Training in a Rehabilitation Facility: An Analysis of Current Practice



Eric Fabara (Spaulding Rehabilitation Hospital), Anne O'Brien, Catherine Adans-Dester, Jean O'Brien Murby, Lori Laliberte, Paolo Bonato

Research Objectives: To investigate the use of robot-assisted gait training (RAGT) as part of the rehabilitation program as determined by physical

therapists in our facility. We evaluated which populations it was used with and the settings the therapists chose such as body weight support (BWS), guidance force (GF), and speed. Additionally, we evaluated the number of sessions and the active therapy time for those populations.

Design: Retrospective Analysis.

Setting: Inpatient and Outpatient Rehabilitation Hospital.

Participants: Inpatients and Outpatients.

Interventions: Robot-assisted gait training using the Lokomat (Hocoma AG, Switzerland).

Main Outcome Measure(s): Number of sessions, BWS, GF, speed, time and distance.

Results: A total of 95 patients and 776 training sessions were analyzed. Primary patient diagnoses included cerebral palsy (CP) 26.3%, spinal cord injury (SCI) 16.8%, stroke 19%, and traumatic brain injury (TBI) 16.8%. Other diagnoses included Guillain-Barré Syndrome, transverse myelitis, ALS, PLS, and anoxic brain injury. Overall, the average duration of a session was 23.8 minutes (SD=8.8), with an average distance of 685 m (SD=307) and average speed of 1.73 km/h (SD=0.35). Selected BWS averaged 10.4% (SD=15.7), while GF averaged 71.1% (SD=23.1). The number of sessions per patient showed a range of 1-91 for CP, 1-21 for SCI, 1-10 for stroke, 2-14 for TBI, 1-19 for other conditions.

Conclusion/Discussion: Robot-assisted gait training is used at our site for various patient populations. GF, BWS, and speed among patient groups vary and merit further analysis, which could aid in developing guidelines for the choice of training settings and progression. This analysis included inpatients and outpatients. Outpatients often undergo multiple treatment cycles, a factor that accounts for the high number of sessions observed for patients with CP.

Key Words: Robotics, Rehabilitation, Spinal Cord Injuries, Brain Injury, Cerebral Palsy

Disclosures: None.

Research Poster 310416

Robotic Exoskeleton Gait Training in Young Adult Acute TBI



Naphtaly Ehrenberg (Kessler Foundation), Ghaith Androwis, Karen Nolan

Research Objectives: The purpose of this investigation is to determine the impact of a single session of early intervention robotic exoskeleton (RE) gait training with a single young adult inpatient after acute traumatic brain injury (TBI).

Design: A prospective study, single subject with/without design.

Setting: Inpatient Rehabilitation Hospital and Gait Analysis Laboratory within a Rehabilitation Research Center.

Participants: A 22-yr-old male with left sided hemiplegia, 4 months post TBI undergoing gait retraining as an inpatient at a rehabilitation institute.

Interventions: Single session in a wearable RE (EksoGT, Ekso Bionics, Inc, Richmond, CA, USA).

Main Outcome Measure(s): Temporal spatial gait parameters while walking on a level surface in two conditions, with and without the RE during acute TBI gait training.

Results: During gait training in the RE, walking speed, step length, and stride length increased while step width decreased on the affected and unaffected side. Total double support time decreased, and single support and swing time increased on the affected and unaffected limb during gait training in the RE.

Conclusion/Discussion: Data presented begins to quantify the temporal spatial differences between gait training in a RE and physical therapist guided gait retraining. Gait training in the RE had a positive effect on the patient's overall gait including improved gait symmetry. The RE provided a large increase in single support suggesting an improvement in weight transfer and increased dynamic balance. Further research with a larger sample with various level of impairment utilizing an RE for gait training is