

Introduction

- Recent developments in wearable powered exoskeletons (WPE) allow gait training (GT) for patients after spinal cord injury.
- Two recent meta-analyses on GT using WPE showed promising results for paraplegic patients.
- The main objective of this review was to assess feasibility and safety of GT using WPE in patients after tetraplegia.

Methods

- PRISMA guidelines
- P:** Adults with tetraplegia, at all stages, after traumatic or vascular SCI
- I:** GT using WPE. In this review, WPE are defined as computer guided systems using motorized orthoses to facilitate autonomous over ground movement in people with disabilities
- C:** Conventional therapy
- O:** - **Primary** = occurrence of adverse events and/or relevant outcomes concerning gait at function or activity level
 - **Secondary** = potential additional health benefits (AHB) regarding gastro-intestinal, urological, or musculoskeletal systems, according to the International Classification of Functioning, Disability and Health of the World Health Organisation model.
- S:** randomized and non-randomized controlled trials, prospective or retrospective cohorts, case series and case studies

Results

- Only one major AE concerned a TP: a stress fracture of the tibia.
- Studies of low level of evidence suggest that GT using WPE could lead to improvements in walking parameters, cardiovascular efficiency and to a reduction of spasticity.

Author, year	Participants (n)	Minor adverse events								Serious adverse events	
		Cutaneous		Cardiovascular			Musculoskeletal	Pain	Fall	Cutaneous	Musculoskeletal or factures
		G1	G2	OH	BPC	HT					

Tetraplegic patients											
Bach Baunsgaard 2018*	14			1							
Benson 2016*	2										
Chang 2020	1										
Chang 2018	2							1			
Delgado 2020	6	1									
Evans 2021	8										1
Schakleton 2021											
Fisahn 2016	1										
Gagnon 2018*	1			1							
Ikumi 2017	1				6						
Jang 2019	1										
Khan 2019	3	1						1			
Lester 2018	1	1									
Shimizu 2017	1	1									
Soma 2021	1							1			
Tsai 2020	4	1									
TOTAL	47	5		2	6			3			1

Conclusion

- GT using WPE is a feasible and safe intervention for tetraplegic patients.
- To minimize occurrence of AE, a good patient selection and preparation is proposed.
- Future clinical trials should be performed to confirm current trends in terms of efficacy and potential AHB.