SOCIETÀ ITALIANA
G.U.I.D.A.
PER LA GESTIONE UNIFICATA E INTERDISCIPLINARE DEL DOLORE MUSCOLO-SCHELETRICO E DELL'ALGODISTROFIA

UPDATE CLINICO E TERAPEUTICO DELLA SPALLA DOLOROSA DELL'EMIPLEGICO

Pietro Fiore
Università degli Studi di Foggia -ICS Maugeri IRCCS sede di Bari
Past President della Società Italiana di Medicina Fisica e Riabilitativa
Presidente del Collegio Docenti SSD MED/34

Centro Congressi Unione Industriali
TORINO 11-13 MAGGIO 2023

ICTUS CEREBROVASCOLARE

- **prevalenza** in Italia nei soggetti di età tra i 65 ed 84 anni:
  6.5% **(**7.4% uomini e 5.9% donne)

- **incidenza** è pari a 144 e 293/100.000/anno ed è maggiore nei soggetti di età compresa tra 64 e 84 anni.

Studio ILSA (Italian Longitudinal Study on Aging) 2003

- ***terza*** **causa di morte e prima causa di disabilità a livello mondiale**
- **prognosi** a 6 mesi: Mortalità del 20%-30%
  Disabilità lieve 20%-25% (in grado di riprendere un'attività professionale)
  Disabilità moderata-severa 20%-30%

STROKE : MANIFESTAZIONI CLINICHE

Disturbi del controllo **motorio** e della **forza**

Disturbi della **coordinazione motoria** e dell'**equilibrio**

Disturbi del **tono muscolare** e delle **sensibilità**

Disturbi della **comunicazione verbale**

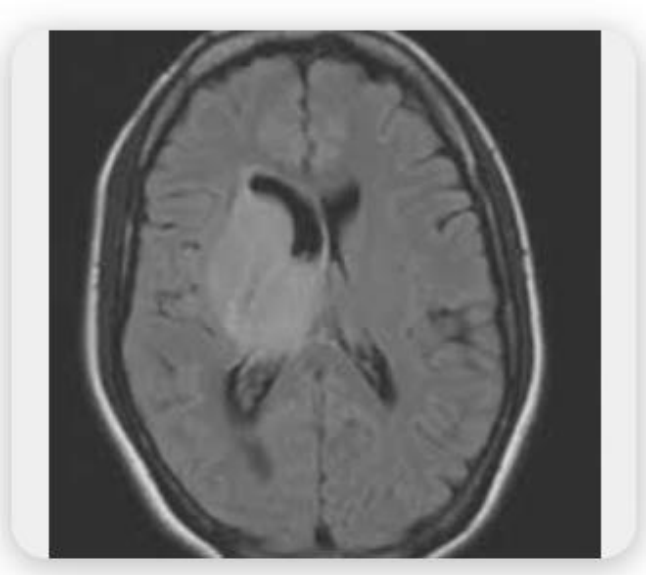
Disturbi del **gesto**

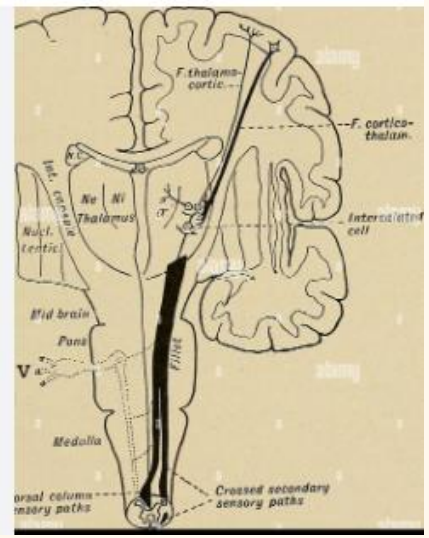
Presenza di **Neglect** Syndrome

Disturbi della **deglutizione**

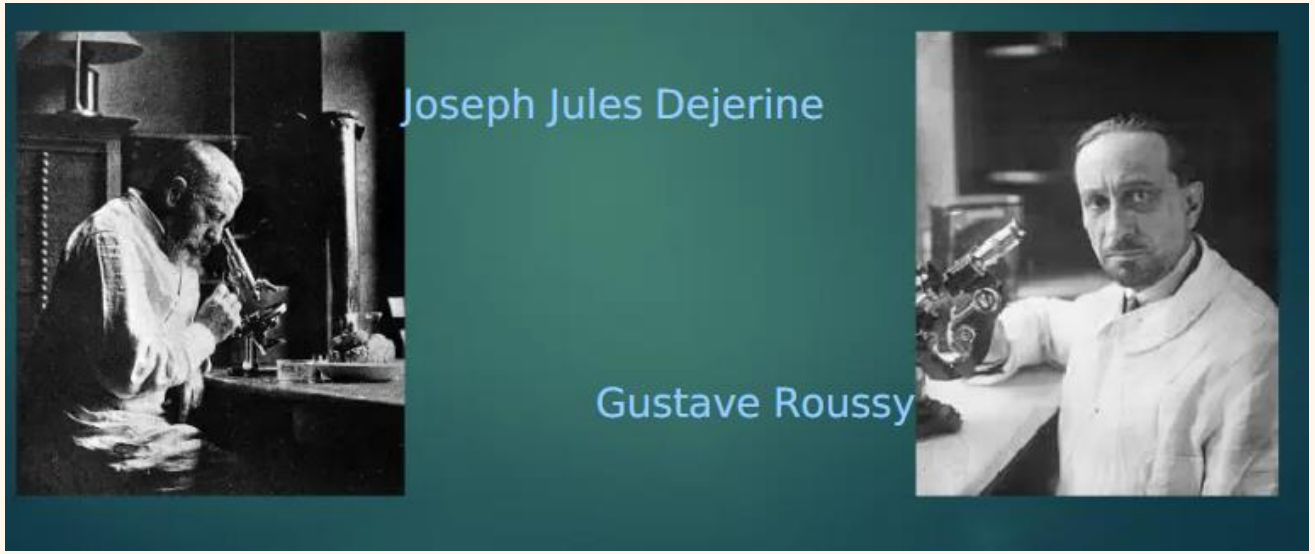
Disturbi della **continenza sfinterica**

Dolore (Sindrome talamica, Emicrania, Spalla dolorosa)





SINDROME TALAMICA POST STROKE



Journal of Pain Research

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ORIGINAL RESEARCH

Bibliometric Analysis of Post-Stroke Pain Research Published from 2012 to 2021

Feng Xiong[1], Peng Shen[1], Zhenhui Li[2], Ziyi Huang[1], Ying Liang[1], Xiwen Chen[1], Yutong Li[3], Xinping Chai[3], Zhen Feng[1,*], Moyi Li[1,*]

[1]Rehabilitation Medicine Department, The First Affiliated Hospital of Nanchang University, Nanchang, People's Republic of China; [2]Children Health Care Department, Longyan First Hospital Affiliated to Fujian Medical University, Longyan, People's Republic of China; [3]First School of Clinical Medicine, Nanchang University, Nanchang, People's Republic of China

*These authors contributed equally to this work

Correspondence: Moyi Li; Zhen Feng, Rehabilitation Medicine Department, The First Affiliated Hospital of Nanchang University, No. 17, Yong Wai Zheng Jie, Nanchang, Jiangxi, 330006, People's Republic of China, Tel +86 15806031050; +86 13970038111, Email limoyi123@aliyun.com; fengzhen@email.ncu.edu.cn

Background and Purpose: Pain is one of the most common symptoms in patients after stroke. It is a distressing experience that affects patients' quality of life, and it is highly prevalent in clinical practice. The pathogenesis mechanisms of PSP are not so clear, and there is currently a lack of effective medical treatments, hence it is necessary to establish a sufficient understanding of this disease. Limited number of studies have applied bibliometric methods to systematically analyze studies on post-stroke pain. This study aimed to systematically analyze scientific studies conducted worldwide on post-stroke pain from 2012 to 2021 to evaluate global trends in this field using a bibliometric analysis.

Methods: Publications related to post-stroke pain from 2012 to 2021 were obtained from the Web of Science Core Collection database. Bibliometrics Biblioshiny R-package software was used to analyze the relationship of publication year with country, institution, journals, authors, and keywords and to generate variant visual maps to show annual publications, most relevant countries, authors, sources, keywords, and top-cited articles.

Results: In this study, 5484 papers met the inclusion criteria. The annual growth rate of publications was 5.13%. The USA had the highest number of publications (1381, 25.2%) and citations (36,395), and the University of Toronto had the highest number of papers (156, 2.8%). "Stroke", "management", "pain", "risk", "prevalence", "ischemic stroke", "risk factors", "disease", "diagnosis" and "therapy" are the top-10 keywords.

Conclusion: The global research interest regarding PSP has maintained growing over the past ten years. Both central post stroke pain and hemiplegic shoulder pain are the hottest research subjects. Further investigations are needed in order to reveal the mystery of the pathophysiologic mechanisms of CPSP, and high-quality well-designed trials of potential treatments of CPSP and HSP are also needed.

Keywords: post-stroke pain, publication trends, bibliometric analysis, research interest

ACRM
AMERICAN CONGRESS OF REHABILITATION MEDICINE

Archives of Physical Medicine and Rehabilitation

journal homepage: www.archives-pmr.org

Archives of Physical Medicine and Rehabilitation 2015;96:241-7

ORIGINAL ARTICLE

Incidence and Associations of Hemiplegic Shoulder Pain Poststroke: Prospective Population-Based Study

Zoe Adey-Wakeling, BMBS, BAppSc,[a] Hisatomi Arima, MD,[b] Maria Crotty, BMed, PhD,[a] James Leyden, MBBS,[c] Timothy Kleinig, MBBS, PhD,[c] Craig S. Anderson, MBBS, PhD,[b] Jonathon Newbury, MBBS, MD,[d] on behalf of the SEARCH Study Collaborative

From the [a]Department of Rehabilitation and Aged Care, Flinders University of South Australia, Adelaide, South Australia; [b]Neurological and Mental Health Division, The George Institute for Global Health, Sydney, New South Wales; [c]Lyell McEwin Health Service and Royal Adelaide Hospital, Adelaide, South Australia; and [d]Faculty of Health Sciences, Discipline of Rural Health, School of Population Health, University of Adelaide, Adelaide, Australia.

Abstract

Objective: To provide an epidemiological perspective of the clinical profile, frequency, and determinants of poststroke hemiplegic shoulder pain.

Design: A prospective population-based study of an inception cohort of participants with a 12-month follow-up period.

Setting: General community and hospital within a geographically defined metropolitan region.

Participants: Multiple ascertainment techniques were used to identify 318 confirmed stroke events in 301 individuals. Among adults with stroke, data on shoulder pain were available for 198 (83% of the survivors) at baseline and for 156 and 148 at 4 and 12 months, respectively.

Interventions: Not applicable.

Main Outcome Measures: Subjective reports of onset, severity, and aggravating factors for pain and 3 passive range-of-motion measures were collected at baseline and at 4- and 12-month follow-up.

Results: A total of 10% of the participants reported shoulder pain at baseline, whereas 21% reported pain at each follow-up assessment. Overall, 29% of all assessed participants reported shoulder pain during 12-month follow-up, with the median pain score (visual analog scale score=40) highest at 4 months and more often associated with movement at later time points. Objective passive range-of-motion tests elicited higher frequencies of pain than did self-report and predicted later subjective shoulder pain (crude relative risk of 3.22 [95% confidence interval, 1.01−10.27]).

Conclusions: The frequency of poststroke shoulder pain is almost 30%. Peak onset and severity of hemiplegic shoulder pain in this study was at 4 months, outside of rehabilitation admission time frames. Systematic use of objective assessment tools may aid in early identification and management of stroke survivors at risk of this common complication of stroke.

Archives of Physical Medicine and Rehabilitation 2015;96:241-7

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Dolore di spalla dell'emiplegico

Complicanza più comune delle persone con ictus
Incidenza : dal 30 % al 65%
Comparsa : entro 2 – 4 mesi dall'esordio e può durare diversi mesi (60% dei casi)
(*) Anche a 12 mesi dopo l'ictus la prevalenza è uguale a quella riscontrata dopo 4 mesi

Dolore di spalla dell'emiplegico

MECCANICI Sublussazione gleno-omerale, lesione della cuffia dei rotatori, tendinite del capo lungo del bicipite , capsulite adesiva, dolore miofasciale

Fattori di rischio :

NEUROLOGICI Plegia, Spasticità, Complex Regional Pain Syndrome, Sensibilizzazione centrale, Parestesie , Neglect S. da intrappolamento nervo periferico

(*) Studi recenti inseriscono : Diabete, Vitamina D3, fattori psicologici,fattori immunitari

CPRS post stroke o Sindrome spalla –mano

Prevalenza : dal 12.5% al 50% (CPRS tipo 1)

Sintomi :

Dolore, iperalgesia, allodinia, edema , gonfiore, limitazione del ROM spalla, gomito, polso e mano, iperemia polsi e mano, sensazione di febbre

CPRS post stroke o Sindrome spalla –mano

Fattori di rischio:

Durata della degenza ospedaliera, sublussazione della spalla, lesione dei tessuti molli della spalla, capsulite adesiva, spasticità, plegia arto superiore. neuropatia da intrappolamento, lesioni del plesso brachiale, broncopolmoniti, sepsi, depressione , malnutrizione e malattia coronarica, immobilizzazione/disuso

Una recente metanalisi ha riportato le principali caratteristiche:

Sesso femminile, emplegia sinistra, sublussazione della spalla, spasticità, mano plegica e compromissione delle ADL

Scale di Outcome:

Fugl-Meyer Assessment(FMA), Action Research Arm Test (ARAT), **MotorActivity Log** (MAL) VAS, NRS

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ORIGINAL RESEARCH

Post-Stroke Complex Regional Pain Syndrome and Upper Limb Inactivity in Hemiplegic Patients: A Cross-Sectional Study

Yuichi Katsura[1,2], Satoshi Ohga[3], Kazuhiro Shimo[3], Takafumi Hattori[2], Tsukasa Yamada[1,2], Takako Matsubara[2,3]

[1]Department of Rehabilitation, Kishiwada Rehabilitation Hospital, Kishiwada-shi, Osaka, 596-0827, Japan; [2]Faculty of Rehabilitation, Kobe Gakuin University Graduate School, Kobe, Hyogo, 651-2180, Japan; [3]Faculty of Rehabilitation, Kobe Gakuin University, Kobe, Hyogo, 651-2180, Japan

Correspondence: Yuichi Katsura, Department of Rehabilitation, Kishiwada Rehabilitation Hospital, 8-10, Kanmatsu-chou, Kishiwada-shi, Osaka, 596-0827, Japan, Tel +81-72-426-7777, Fax +81-72-426-7771, Email rm9xhj04@s.kobegakuin.ac.jp

Purpose: The purpose of this study was to investigate the prevalence of post-stroke complex regional pain syndrome (CRPS) and to examine the characteristics of inactivity status of the upper limb in post-stroke CRPS patients. In addition, as a sub-analysis, the association between the upper limb inactivity status and pain intensity was investigated in post-stroke CRPS patients.

Patients and Methods: This cross-sectional study included 102 patients with first-ever stroke between April 2019 and February 2020. Each patient was allocated into one of two groups based on the presence or absence of CRPS. Demographic data (age, sex, stroke etiology, lesion side, and number of days since stroke onset) were collected. The following evaluations were performed in all patients: Fugl–Meyer Assessment (FMA), Action Research Arm Test (ARAT), and Motor Activity Log (MAL). The numerical rating scale (NRS) to determine pain intensity was assessed only in patients with post-stroke CRPS.

Results: Nineteen and 83 patients were assigned to the post-stroke CRPS and control group, respectively. The prevalence of post-stroke CRPS was 18.6% (19/102). FMA, ARAT, and MAL scores were significantly lower in patients with post-stroke CRPS than those without it. FMA and ARAT scores were significantly correlated with NRS scores, but MAL was almost zero-scored in patients with post-stroke CRPS.

Conclusion: The study results indicated that activity status of the affected upper limb was severely deteriorated, and more inactivity of the upper limb was associated with higher pain intensity in patients with post-stroke CRPS. Thus, our results suggest that post-stroke CRPS may be influenced by the degree of upper limb inactivity after stroke.

Keywords: complex regional pain syndrome, post-stroke shoulder-hand syndrome, stroke, Fugl–Meyer Assessment, Action Research Arm Test, Motor Activity Log

Evoluzione della Sindrome Spalla Mano nell'emiplegico

1)Fase iniziale

Fase infiammatoria e Iperemica

Comparsa di dolore e edema

Modificazioni della temperatura e del colore della cute

2) **Fase intermedia**

Fase sub-cauta o distrofica

Peggioramento dei sintomi e dei segni come il dolore e la limitazione funzionale

Cambiamenti nella struttura ossea di tipo osteoporotico

Evoluzione della Sindrome Spalla Mano nell'emiplegico

Fase finale

Fase cronica o atrofica

Scomparsa dell' edema che può evolvere in tessuto fibroso e cicatriziale.

Perdita della mobilità anche passiva visto che in genere in questi pazienti la mobilità attiva è persa

NEGLECT

"The hemiplegic patient with neglect is at
a potentially increased risk for trauma to
the upper arm and shoulder"

Arch Med Phys Rehabil 1990

Approccio terapeutico al dolore di spalla

Corretto posizionamento a letto e in carrozzina

Corretta gestione del paziente nei cambi di postura e nei trasferimenti

Mobilizzazione precoce dell'arto

Rieducazione funzionale e neuromotoria

Terapia assistita da Robot

Taping Cinesiologico

Ausili e ortesi

CORRETTO POSIZIONAMENTO A LETTO

CORRETTO POSIZIONAMENTO IN CARROZZINA

ERIGO (Hocoma)
Consente una mobilizzazione e verticalizzazione in tempi precoci

BMC Neurol. 2016 Sep 13;16:169. doi: 10.1186/s12883-016-0684-2.

Sympathetic activity and early mobilization in patients in intensive and intermediate care with severe brain injuries: a preliminary prospective randomized study.

Rocca A[1], Pignat JM[2], Berney L[2], Jöhr J[2], Van de Ville D[3], Daniel RT[4], Levivier M[4], Hirt L[5], Luft AR[6], Grouzmann E[7], Diserens K[2].

Author information

Abstract

BACKGROUND: Patients who experience severe brain injuries are at risk of secondary brain damage, because of delayed vasospasm and edema. Traditionally, many of these patients are kept on prolonged bed rest in order to maintain adequate cerebral blood flow, especially in the case of subarachnoid hemorrhage. On the other hand, prolonged bed rest carries important morbidity. There may be a clinical benefit in early mobilization and our hypothesis is that early gradual mobilization is safe in these patients. The aim of this study was to observe and quantify the changes in sympathetic activity, mainly related to stress, and blood pressure in gradual postural changes by the verticalization robot (Erigo®) and after training by a lower body ergometer (MOTOmed-letto®), after prolonged bed rest of minimum 7 days.

METHODS: Thirty patients with severe neurological injuries were randomized into 3 groups with different protocols of mobilization: Standard, MOTOmed-letto® or Erigo® protocol. We measured plasma catecholamines, metanephrines and blood pressure before, during and after mobilization.

RESULTS: Blood pressure does not show any significant difference between the 3 groups. The analysis of the catecholamines suggests a significant increase in catecholamine production during Standard mobilization with physiotherapists and with MOTOmed-letto® and no changes with Erigo®.

CONCLUSIONS: This preliminary prospective randomized study shows that the mobilization of patients with severe brain injuries by means of Erigo® does not increase the production of catecholamines. It means that Erigo® is a well-tolerated method of mobilization and can be considered a safe system of early mobilization of these patients. Further studies are required to validate our conclusions.

TRIAL REGISTRATION: The study was registered in the ISRCTN registry with the trial registration number ISRCTN56402432 . Date of registration: 08.03.2016. Retrospectively registered.

KEYWORDS: Brain injuries; Catecholamines; Mobilization; Neurovegetative disorders; Robotic; Subarachnoid hemorrhage

Mobilizzazione con l'uso di robot (Erigo)

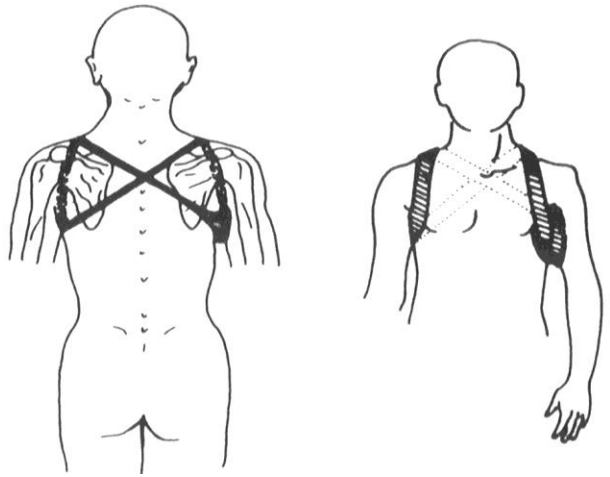
Rischi di una verticalizzazione precoce con il piano da statica elettrico

Conventional Tilt Table Training

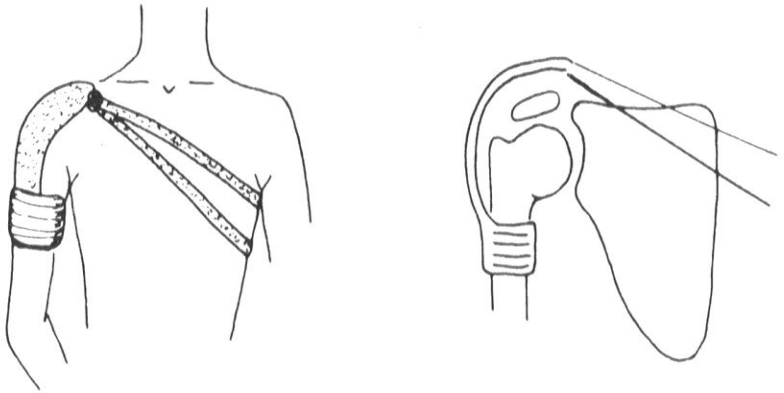
- risk of secondary brain damage due to circulatory instability
- no leg movement and thus reduced musculoskeletal and cardiovascular improvement
- limited training duration due to lack of patient's cardiovascular stability

ORTESI

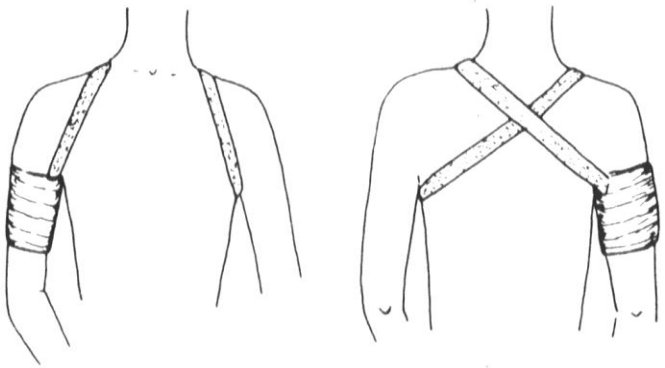
Tutore ad anello



Tutore di Cailliet



Tutore di Bobath



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ORTESI

testo

Tutore di Cailliet

Tutore di Bobath

Fasciatura ad Anello

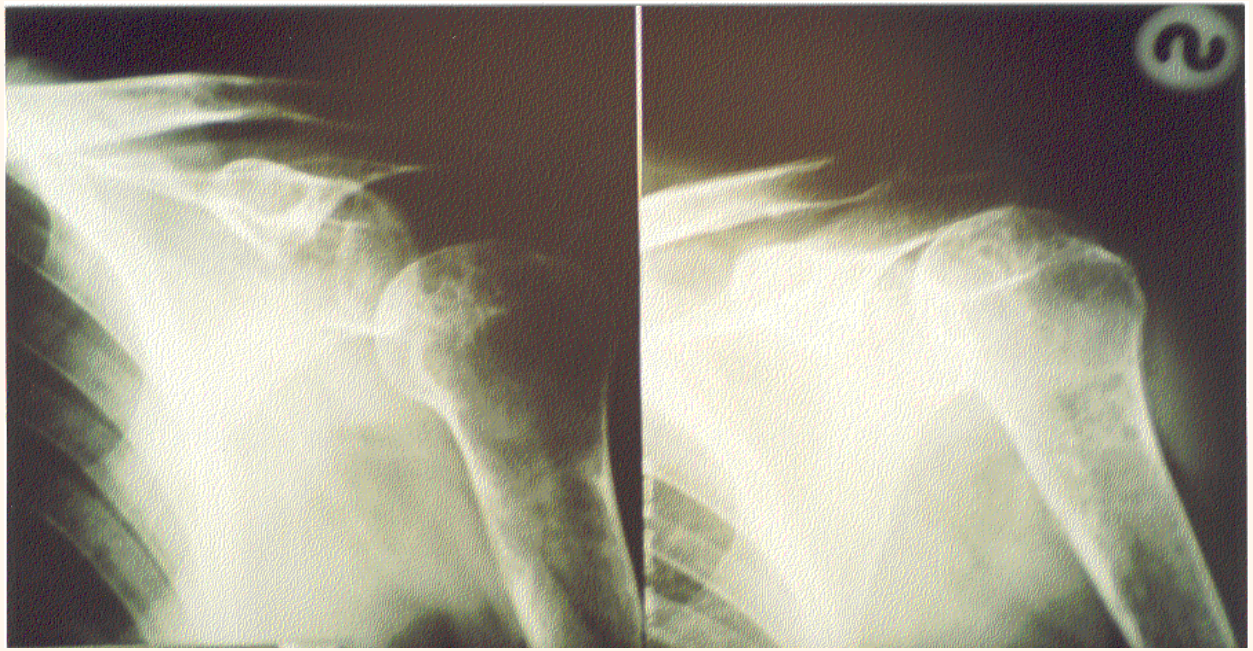
Vantaggi

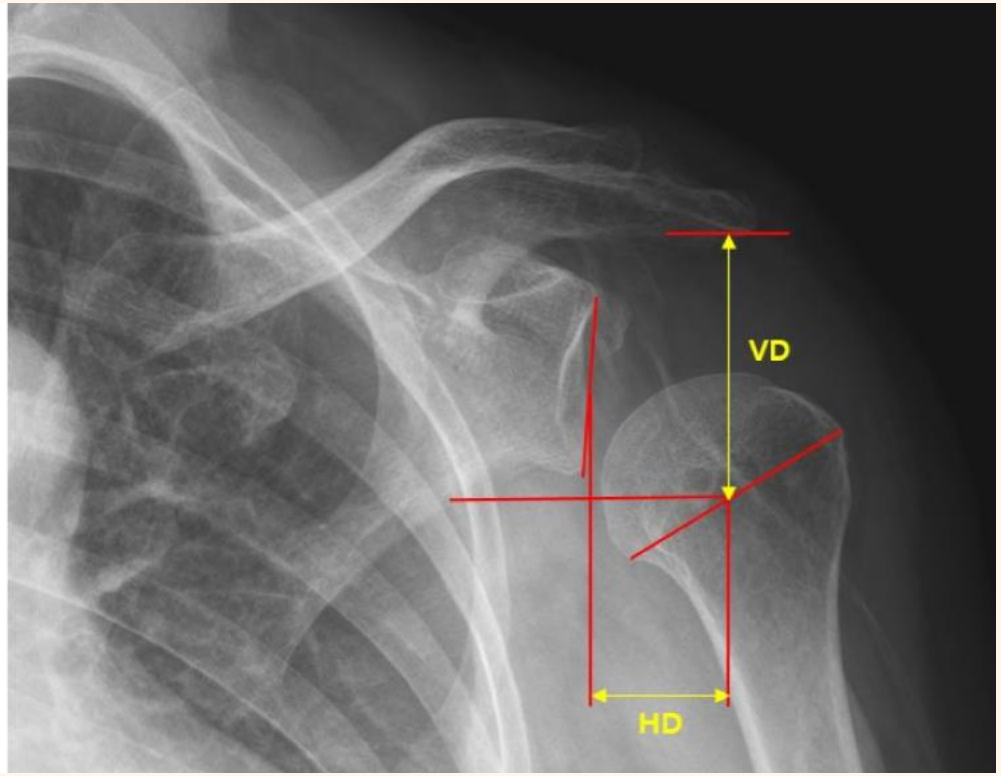
- Possibile l'esercizio terapeutico
- Blanda azione coattante
- Ottima estetica

Svantaggi

- Difficoltà circolatorie all'arto plegico
- Difficile la giusta regolazione

Sublussazione dell'art.scapolo-omerale





ortostasi **supino**

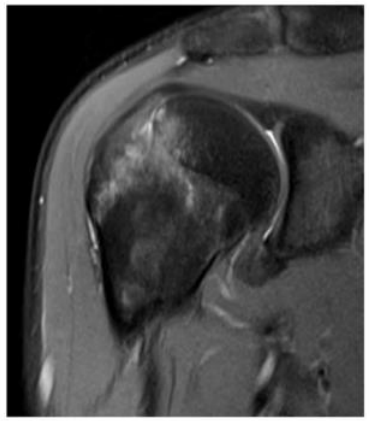


FIGURE 2
Fat suppressed T2 images. The bone marrow edema is shown.

On the basis of our MRI findings, we found a high frequency of bursa effusion, rotator cuff injury, and long head of the biceps tendon injury in patients with HSP. Compared to patients with HSP in the non-subluxation group, we found that patients with HSP in the subluxation group were more prone to BME, long bicipital tendon-glenoid labrum injury, and glenoid labrum injury. Thus, in patients with HSP, we recommend that physicians avoid moving the upper limbs above 60° with abduction action. If patients have subluxation, physicians and therapists should plan to reduce the external rotation and abduction movements to prevent rotator cuff injury and long bicipital tendon-glenoid labrum injury during rehabilitation. Patients with subluxation should be moved gently if they require passive actions. Moreover, they should be educated about protecting their shoulders during ADLs. Further studies with a larger sample size are needed to confirm our findings.

frontiers | Frontiers in Neurology

TYPE Original Research
PUBLISHED 14 November 2022
DOI 10.3389/fneur.2022.1032676

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OPEN ACCESS

EDITED BY
Janika Kõrv,
University of Tartu, Estonia

REVIEWED BY
Hrvoje Budincevic,
University Hospital Sveti Duh, Croatia
Joshua C. Cheng,
Harvard Medical School, United States

*CORRESPONDENCE
Li-Ning Zhang
Zhangln301@163.com

†These authors have contributed equally to this work

SPECIALTY SECTION
This article was submitted to

Magnetic resonance imaging findings in painful hemiplegic shoulder patients with or without subluxation: A retrospective cohort study

Hui-Min Xie[1†], Xiao-Tan Zhang[1†], Lin Xu[2†], Ning Wang[1], Rui Wang[1], Zi-Shan Jia[1] and Li-Ning Zhang[1*]

[1]Department of Rehabilitation Medicine, The First Medical Centre, Chinese PLA General Hospital, Beijing, China, [2]Department of Radiology, The First Medical Centre, Chinese PLA General Hospital, Beijing, China

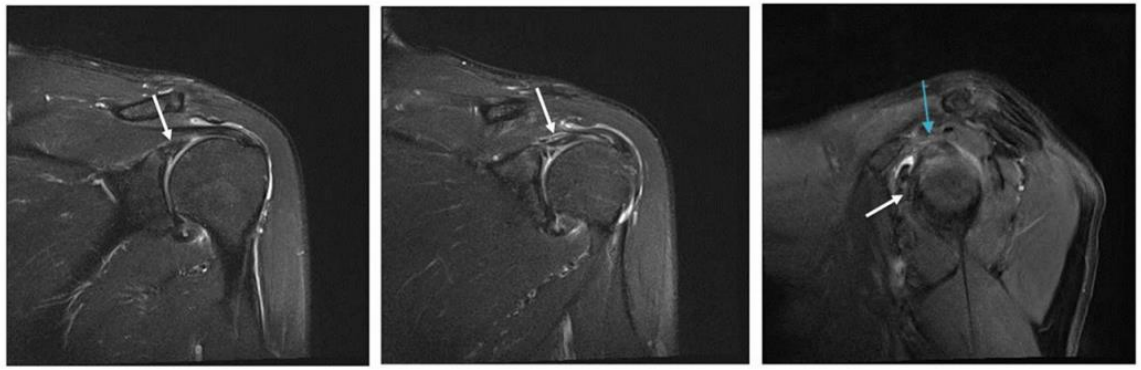

FIGURE 3
Fat suppressed T2 images. The long bicipital tendon-glenoid labrum injury is shown by the white arrow. The sup-glenoid labrum injur by the blue arrow.

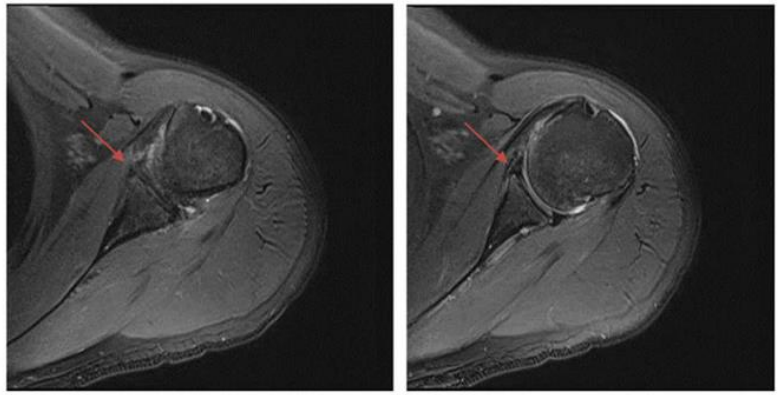

FIGURE 4
Fat suppressed T2 images. The anterior labrum injury is shown by the red arrow.

Approccio terapeutico al dolore di spalla

(Se prevalgono i fattori neurologici)

EMG Biofeedback

TENS, FES

Tossina Botulinica

Farmaci:

Amitriptilina (da 12.5mg a 25 mg die) , SSRI, Gabapentinoidi, Carbamazepina, Tapendalolo (Palexia), Ossicodone (in associazione a paracetamolo o naloxone, Targin Depalgos), Baclofene, Neridronato (2 mg/kg peso corporeo e.v .ogni tre mesi)

Approccio terapeutico al dolore di spalla

(Se prevalgono i fattori meccanici)

Farmaci:

Paracetamolo, FANS, Corticosteroidi orali

Infiltrazioni intrarticolari/Intrabursali con corticosteroidi

Infiltrazione con Lidocaina dei Trigger Point

Blocco nervoso del n. Sovrascapolare

Agopuntura

Terapia Chirurgica

L'introduzione del trattamento farmacologico per il controllo del dolore è necessaria quando la mobilità della spalla e la partecipazione del paziente al trattamento riabilitativo sono limitate dal dolore.

La gestione interventistica (infiltrazioni, tossina botulinica, blocchi nervosi , blocchi simpatici) è indicata quando le misure conservative falliscono, quando il paziente non può tollerare il trattamento o non progredisce con il trattamento a causa del dolore, della spasticità o per lo sviluppo della Complex Regional Pain Syndrome

Annals of Physical and Rehabilitation Medicine 65 (2022) 101602

Available online at ScienceDirect www.sciencedirect.com

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Meta-analyses

Efficacy of rehabilitative techniques in reducing hemiplegic shoulder pain in stroke: Systematic review and meta-analysis

Alessandro de Sire[a,1,*], Lucrezia Moggio[a,1], Andrea Demeco[a], Francesco Fortunato[b], Riccardo Spanò[a], Vincenzo Aiello[c], Nicola Marotta[a], Antonio Ammendolia[a]

[a] Physical and Rehabilitative Medicine, Department of Medical and Surgical Sciences, University of Catanzaro "Magna Graecia", 88100 Catanzaro, Italy
[b] Neurology Institute, Department of Medical and Surgical Sciences, University of Catanzaro "Magna Graecia", 88100 Catanzaro, Italy
[c] Rheumatology Unit, Department of Clinical Medicine and Surgery, University Federico II, Naples, Italy

ARTICLE INFO

Article History:
Received 19 April 2021
Accepted 13 September 2021

Keywords:
Hemiplegic shoulder pain
Stroke
Rehabilitation
Pain
Botulinum toxin
Dry needling

ABSTRACT

Background: : Hemiplegic shoulder pain (HSP) is a disabling complication affecting stroke survivors. In this context, rehabilitation might play a key role in its clinical management. Recent systematic reviews of the impact of rehabilitative approaches on pain reduction in patients with HSP are lacking.
Objective: : This systematic review of randomized controlled trials (RCTs) with meta-analysis aimed to investigate the efficacy of rehabilitative techniques in reducing HSP in stroke survivors.
Methods: : PubMed, Scopus, and Web of Science were searched from inception to March 8, 2021 to identify RCTs of stroke survivors with HSP undergoing specific rehabilitative techniques combined with conventional therapy to reduce pain intensity. A network meta-analysis and meta-analysis of the Bayesian network of random effects were performed. The risk of bias of studies was assessed with Version 2 of the Cochrane Risk of Bias tool for randomized trials.
Results: : Of 1139 articles identified, 12 were included in the final synthesis. We analyzed data for 723 stroke survivors, reporting a significant overall decrease in pain intensity after a rehabilitative approach by the Bayesian meta-analysis (standardized mean difference 2.78, 95% confidence interval 0.89;-4.59; $p = 0.003$). We report a significant reduction in HSP with botulinum toxin type A injection ($p = 0.001$), suprascapular nerve pulsed radiofrequency ($p = 0.030$), suprascapular nerve block ($p = 0.020$), and trigger-point dry needling ($p = 0.005$) as compared with conventional rehabilitation. Concerning the effect size, we identified a Bayesian factor$_{10}$ of 97.2, with very strong evidence of superiority of rehabilitative techniques.
Conclusions: : The present systematic review and meta-analysis showed that adding other rehabilitative techniques to conventional rehabilitation was significantly more effective than conventional rehabilitation alone in the complex management of patients affected by HSP.

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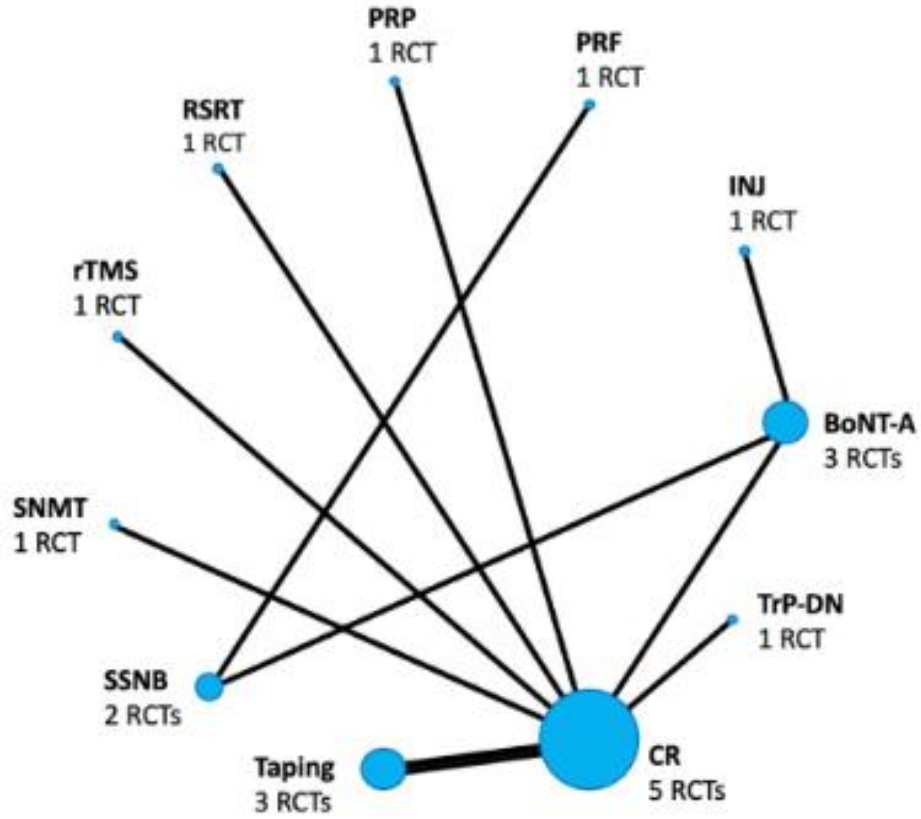

Fig. 2. Network plot illustrating the indirect comparisons between interventions. BoNT-A, botulinum toxin type A; CR, conventional rehabilitation; INJ, corticosteroid injection; PRF, pulsed radiofrequency; PRP, platelet-rich plasma; RSRT, robotic shoulder rehabilitation treatment; rTMS, repetitive transcranial magnetic stimulation; SNMT, segmental neuromyotherapy; SSNB, suprascapular nerve block; TrP-DN, trigger points dry needling.

Spasticità post-ictus

Farmaci per la spasticità

- Tradizionali:
- benzodiazepine (diazepam/Valium®
- baclofen (Lioresal®) per os o intratecale
- dantrolene sodium (Dantrium®)
- clonidina (Catapres®)
- **Tossina botulinica**

Riabilitazione della mano con stimolazione elettrica funzionale

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Rehabilitation of reaching and grasping function in severe hemiplegic patients using functional electrical stimulation therapy.

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Cleveland Functional Electrical Stimulation Center, Case Western Reserve University, 2500 MetroHealth Drive, Cleveland, Ohio 44109, USA

LE “FIGLIE” DELLA NEUROPLASTICITÀ

Constraint Induced Movement Therapy

Basata sul superamento del L.n.U.

Mirror Therapy

Basata sulla scoperta dei neuroni “a specchio”

Mental Practice

Basata sulla prefigurazione del gesto

Tecniche di motor observation e motor imagery:

l'informazione fornita dalla motor observation

e dalla motor imagery può contribuire al recupero funzionale

↓

come fonte addizionale di informazioni utili nel complesso processo di riorganizzazione dell'area cerebrale danneggiata

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si articola in una serie di attivita' artistiche, ricreative, professionali, intellettuali e della vita quotidiana con lo scopo di sviluppare l'autonomia, stimolare le attivita' psichiche, completare la rieducazione motoria.

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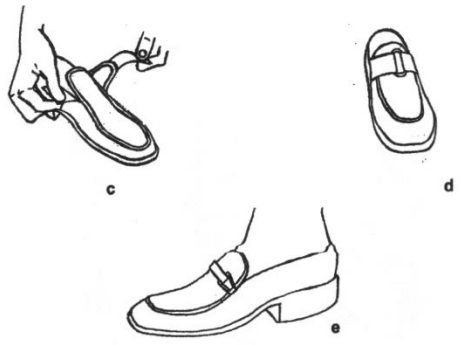

Serrezuela *et al. Journal of NeuroEngineering and Rehabilitation* (2020) 17:54
https://doi.org/10.1186/s12984-020-00674-6

Journal of NeuroEngineering and Rehabilitation

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Robotic therapy for the hemiplegic shoulder pain: a pilot study

Ruthber Rodríguez Serrezuela[1*], Mauricio Torres Quezada[2], Marcia Hernández Zayas[3], Arquímedes Montoya Pedrón[3], Daily Milanés Hermosilla[2] and Roberto Sagaró Zamora[2]

Abstract

Backgrounds: Exoskeletons development arises with a leading role in neurorehabilitation technologies; however, very few prototypes for upper limbs have been tested, contrasted and duly certified in terms of their effectiveness in clinical environments in order to incorporate into the health system. The purpose of this pilot study was to determine if robotic therapy of Hemiplegic Shoulder Pain (HSP) could lead to functional improvement in terms of diminishing of pain, spasticity, subluxation, the increasing of tone and muscle strength, and the satisfaction degree.

Methods: An experimental study was conducted in 16 patients with painful shoulder post- ischemic stroke in two experimental groups: conventional and robotic therapy. At different stages of its evolution, the robotic therapy effectiveness applied with anti-gravitational movements was evaluated. Clinical trial was developed at the Physical Medicine and Rehabilitation Department of the Surgical Clinical Hospital "Dr. Juan Bruno Zayas Alfonso" in Santiago de Cuba, from September 2016 - March 2018. Among other variables: the presence of humeral scapular subluxation (HSS), pain, spasticity, mobility, tone and muscle strength, and the satisfaction degree were recorded. Results with 95% reliability were compared between admission and third months of treatment. The Mann-Whitney U-Test, Chi-Square and Fisher's Exact Tests were used as comparison criteria.

Results: Robotic therapy positively influenced in the decrease and annulment of pain and the spasticity degree, reaching a range increase of joint movement and the improvement of muscle tone.

Keywords: Stroke, Neurorehabilitation, Robotic therapy, Hemiplegic shoulder pain

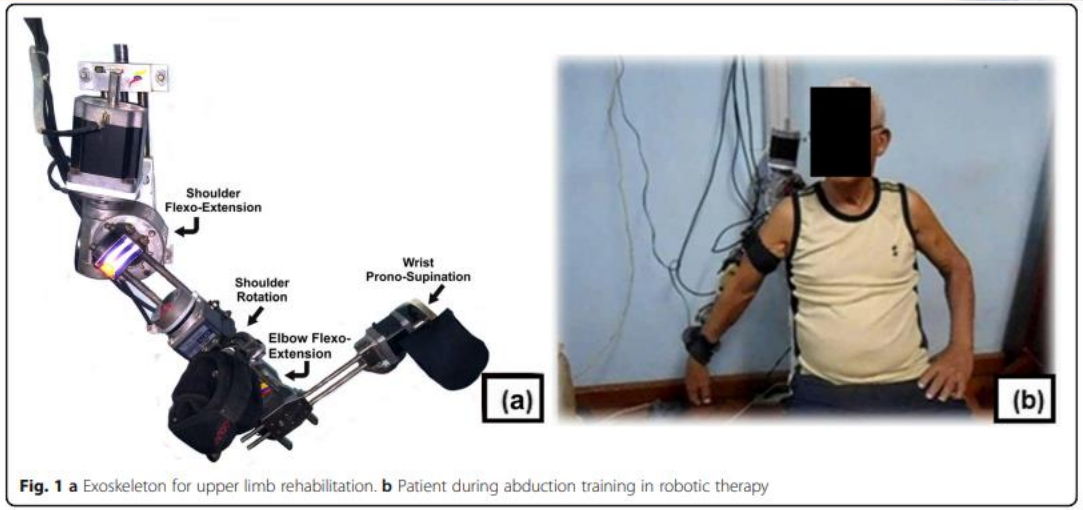

Fig. 1 **a** Exoskeleton for upper limb rehabilitation. **b** Patient during abduction training in robotic therapy

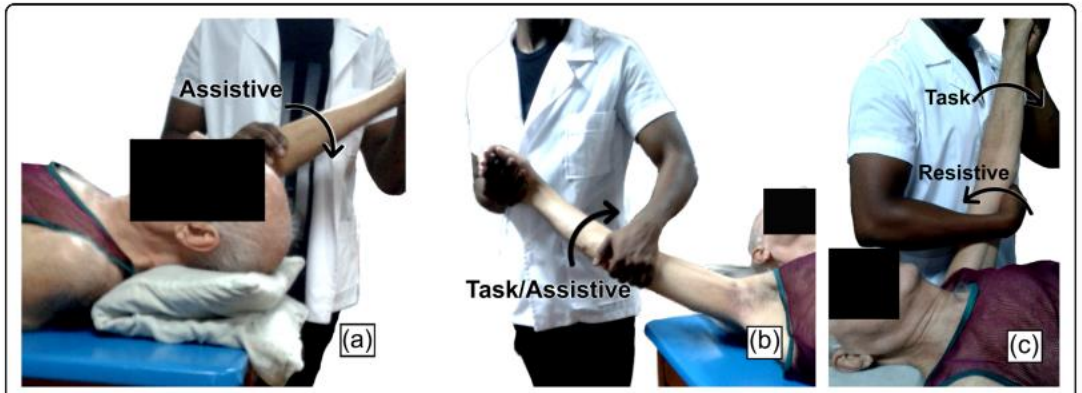

Fig. 2 Exercises in conventional therapy. **a** Passive exercise in shoulder flexion assisted by the physiotherapist. **b** Active abduction exercise assisted by the physiotherapist. **c** Active-resistive exercise during the flexion/extension movement of the shoulder

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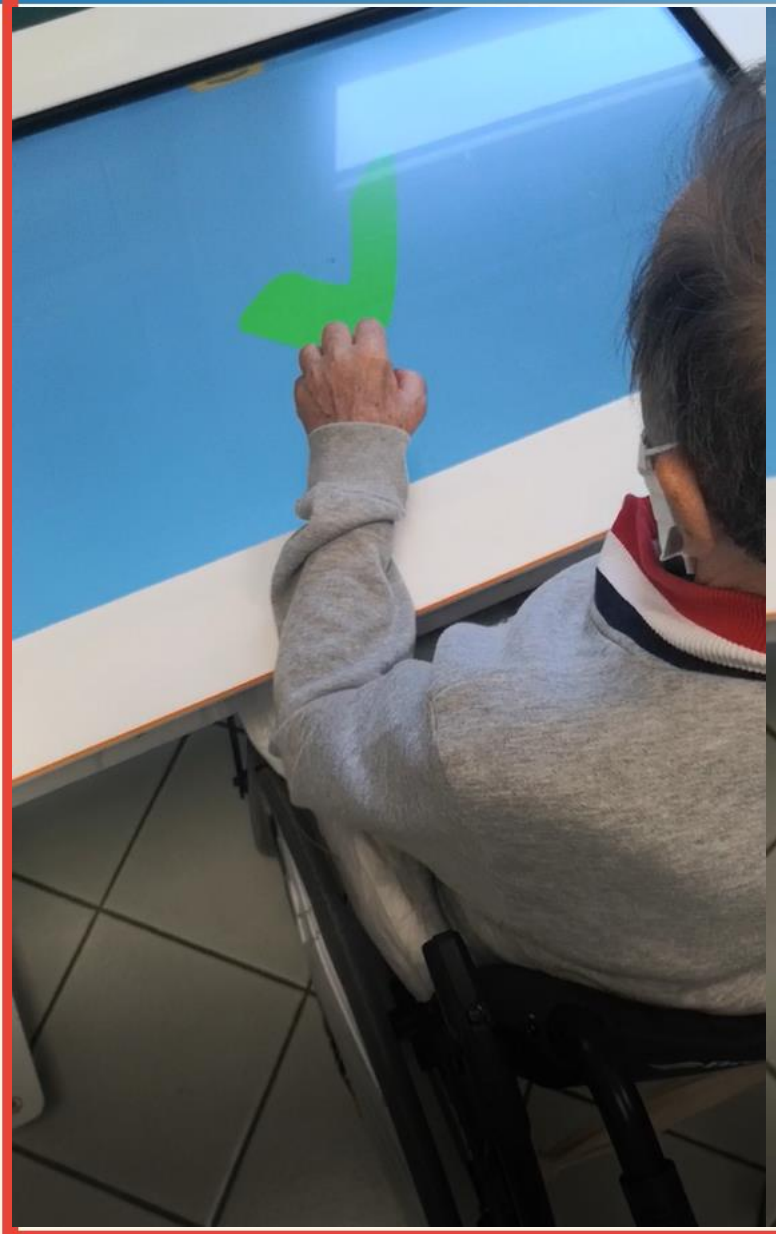

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