

Supplementary Materials

Table 1. Characteristics of the studies included.

First Author, Year	Country	Study Design	Level of Evidence	Study Population Size, Diagnosis	Area of Review
Alter, 2017	United States	Review	IV	NA	Ultrasound modalities
Aşkın, 2017	Turkey	Cohort, Prospective	III	Adult (48) Stroke requiring BoNT-A to biceps brachialis	Ultrasound modalities
Battaglia, 2021	Italy	Cross-sectional, Prospective	III	Adult (56, mean age 60.8 years) Stroke	BoNT Muscle change, Ultrasound modalities
Battisti, 2018	Italy	Cross-sectional	III	Pediatric Patients (60, mean age 86 years) Cerebral palsy hemiplegic form (17) Cerebral palsy diplegic form (43)	Ultrasound modalities
Booth, 2001	United Kingdom	Observational, Prospective	III	Pediatric (26, mean age 10.6 years) Diplegic or quadriplegic Cerebral palsy	Histology changes
Cahill, 1986	New Zealand	Observational, Prospective, Animal	NA	Equine (15 horses) Laryngeal hemiplegia	Histology changes
Calvo-Lobo, 2018	Spain	Observational, Case-Control	III	Adult (11 patients, 22 feet) Stroke	Ultrasound modalities
Calvo-Lobo, 2018	Spain	Observational, Case-Control	III	Adult (40, 20 feet ipsilateral, 20 feet	Ultrasound modalities

				contralateral, 20 health control) Stroke	
Chalmers, 2015	United States	Experimental, Prospective, Animal	NA	Equine (28 horses) Recurrent laryngeal nerve transection	Histology changes
Cosenza, 2020	Italy	Observational, Prospective	III	Adult (47) Stroke	Ultrasound modalities
Dias, 2017	Brazil	Observational, Prospective	III	Adult (30, 15 control, 15 stroke) Stroke	Ultrasound modalities
Eby, 2016	United States	Cross-sectional	III	Adult (9) Stroke	Ultrasound modalities
Eby, 2017	United States	Case Report	IV	Adult (1) Stroke hemiparesis	Ultrasound modalities
Filippetti, 2022	Italy	Chart review, Retrospective	IV	Adult (48) Spastic equinovarus	Ultrasound modalities, Ultrasound clinical
Frieden, 2003	United States	Observational, Prospective	III	Adult (41 control without neuromuscular condition), Pediatric (15 experimental) Cerebral palsy	Histology changes
Fröhlich-Zwahlen, 2014	Switzerland	Observational, Prospective	III	Adult (40, 20 control, mean age 52±11 years; 20 stroke, mean age 53±10 years)	Ultrasound modalities
Gao, 2018	United States	Case-control, Prospective	III	Adult (15, 8 control, 7 post-stroke) Stroke with chronic spasticity	Ultrasound modalities

Gao, 2018	United States	Case-control, Prospective	III	Adult (16, 8 control, 8 post-stroke) Stroke	Ultrasound modalities
Gao, 2019	United States	Feasibility Study, Prospective	III	Adult (8, mean age 58 years) Stroke who underwent elbow flexor BoNT-A (4 hemorrhagic, 4 ischemic)	Ultrasound modalities
Gillies, 2011	United States	Review	V	NA	Histology changes
Hadi, 2018		Case Series	IV	Adult (6) Stroke	Ultrasound modalities
Hara, 2018	Japan	Cohort, Retrospective	III	Adult (102) Stroke	Ultrasound modalities
Harrison, 1991	United States	Observational, Prospective, Animal	NA	Equine (18 foals) Equine recurrent laryngeal neuropathy	Histology changes
Hong, 2018	Korea	Case Control, Prospective	III	Adult (16, 8 control mean age 26.7 years, 8 stroke mean age 59.6 years) Stroke (3 hemorrhagic, 5 ischemic)	Ultrasound modalities
Jakubowski, 2017	United States	Observational, Prospective	III	Adult (14, mean age 60.1 years) Chronic hemiparesis	Ultrasound modalities
Kenis-Coskun, 2020	Turkey	Cross-sectional	III	Adult (48) Stroke	Ultrasound modalities
Kesikburun, 2015	Turkey	Observational, Cross-sectional	III	Adult (26) Stroke	Ultrasound modalities
Kim, 2021	Singapore	Observational, Prospective	III	Adult (40)	Ultrasound clinical

				Ischemic/Hemorrhagic stroke	
Lee, 2015	United States	Observational	III	Adult (16) Stroke	Ultrasound modalities
Lee, 2019	South Korea	Randomized Control Trial	II	Adult (18) Stroke	Ultrasound modalities
Lee, 2019	United States	Cross-sectional	III	Adult (22, 8 control, 14 post-stroke, mean age 58.9 years) Stroke with hemiparesis	Ultrasound modalities
Leng, 2019	China	Cross-sectional	III	Adult (15) Stroke hemiplegic	Ultrasound modalities
Lieber, 1986 Lieber, 1986 Lieber, 1986	United States	Experimental, Prospective, Animal	NA	Rats (24, 10 experimental, 14 control) Thoracic spinal cord transection	Histology changes
Lieber, 2003	United States	Observational, Prospective	III	Adult (21 control without neuromuscular condition), Pediatric (9 experimental) Cerebral palsy	Histology changes
Lieber, 2017	United States	Review	V	NA	Histology changes
Liu, 2020	China	Cohort, Prospective	III	Adult (60) Stroke with upper limb spasm	Ultrasound modalities
Loizou, 2006	Cyprus	Observational	V	NA	Ultrasound clinical
Mathevon, 2015	France	Systematic Review	NA	Human/Animal	BoNT muscle change

Mathevon, 2018	France	Cohort, Prospective	III	Adult (14) Stroke	Ultrasound modalities
Miller, 2021	Hong Kong	Systematic Review	IIIa	NA Neurological conditions investigated: stroke, Cerebral palsy, Duchenne muscular dystrophy and Parkinson disease	Ultrasound clinical
Michailovich, 2013	United States	Observational	V	NA	Ultrasound clinical
Moreta, 2020	United States	Prospective, Observational	III	Adult (50, 45 upper/lower limb spasticity, mean age 48.8 years; 5 control, mean age 27.2 years) Spasticity (Stroke, Traumatic Brain Injury, Multiple Sclerosis, Other)	Ultrasound modalities, Ultrasound clinical
Picelli, 2012	Italy	Cohort, Prospective	III	Adult (56) Stroke, Spastic equinus	Ultrasound modalities
Picelli, 2014	Italy	Observational, Prospective	III	Adult (43) Stroke, Spastic equinus	Ultrasound modalities, Ultrasound clinical
Picelli, 2017	Italy	Observational, Prospective	III	Adult (46) Stroke	Ultrasound clinical
Picelli, 2017	Italy	Observational, Case-control	III	Adult (38) Multiple sclerosis	Ultrasound modalities, Ultrasound clinical

Picelli, 2020	Italy	Observational, Retrospective	III	Adult (21, mean age 65.6 years) Stroke	Ultrasound modalities
Pillen, 2006	Netherlands	Comparative, Prospective	III	Pediatric (76) Neuromuscular disease	Histology changes
Pillen, 2009	Netherlands	Observational, Prospective	NA	Animal (14 golden retrievers) Muscular dystrophy	Histology changes
Pillen, 2009	Netherlands	Observational	V	Adult (7) Healthy	Ultrasound clinical
Pillen, 2011	Netherlands	Expert Opinion	V	NA	Ultrasound clinical
Pingel, 2017	Denmark	Review	V	NA	Histology changes
Rasool, 2016	United States	Case series	IV	Adult (3) Stroke	Ultrasound modalities
Santamato, 2014	Italy	Prospective open-label study	III	Adult (23) Stroke with spastic equinus foot	Ultrasound modalities
Schillebeeckx, 2020	Belgium	Systematic Review	IIIa	NA	Ultrasound clinical
Schroeder, 2009	Germany	Prospective, double-blind	IV	Healthy Adult (2)	BoNT Muscle change
Slocombe, 1981	Australia	Observational, Prospective, Animal	NA	Equine (9 horses) Australian Stringhalt	Histology changes
Smith, 2011	United States	Observational, Prospective	III	Pediatric (33 experimental, 19 control) Cerebral palsy	Histology changes
Thielman, 2019	United States	Pilot study, Prospective	IV	Adults (11) Stroke	Ultrasound modalities

Tran, 2021	United States	Review	V	NA	Ultrasound clinical
Valentine, 2016	Australia	Prospective, Cross-sectional	III	Pediatric (10, mean age 11 years 7 months) Cerebral palsy	Histology changes
Wu, 2017	Taiwan	Case-control	III	Adult (31) Stroke	Ultrasound modalities
Wu, 2013	China	Expert Opinion	V	NA	Ultrasound clinical
Yang, 2014	China	Cohort, Prospective	III	Adult (41, 26 'spastic group', 15 'normal muscle tone group') Stroke	Ultrasound modalities
Yasar, 2016	Turkey	Cross-sectional, Prospective	III	Adult (23) Stroke with forearm spasticity	Ultrasound modalities
Yoldas, 2021	Turkey	Randomized control trial	II	Adult (51, 17 in active therapy, 17 in sham therapy, 17 control) Stroke with ankle flexor spasticity	Ultrasound modalities

BoNT-A – Botulinum Neurotoxin A, NA – Not Applicable