SESSION PARALLEL SITOD “REVIEW OF THE LITERATURE AND RECOMMENDATIONS OF THERAPY WITH SHOCK WAVES “ AULA NETTUNO

Chairman: C. D'Agostino, E. Amelio, M. C. Vulpiani

Treatment of delayed consolidation – S. Gigliotti (Italy)
Treatment of tendinopathy – P. Buselli (Italy)
Treatment of muscle injury – A. Notarnicola (Italy)
Treatment of spasticity – B. Corrado (Italy)

Ernesto Amelio
Elena Chemello
Bruno Corrado
Carla De Luise
Irene Iommazzo

Azienda Ospedaliera Universitaria Integrata
Verona

Università degli Studi di Napoli
FEDERICO II
Treatment of spasticity

- Children

- Adults
Cerebral Palsy

Stroke
7° I.S.M.U.L.T. Congress Rome 1-2 December 2017
Shock Waves & Cerebral Palsy

• 2002 → 2017

• 8 papers
   A PROSPECTIVE CASE-CONTROL STUDY OF RADIAL EXTRACORPOREAL SHOCK WAVE THERAPY FOR SPASTIC PLANTAR FLEXOR MUSCLES IN VERY YOUNG CHILDREN WITH CEREBRAL PALSY.
   Wang T(1), Du L, Shan L, Dong H, Feng J, Kiessling MC, Angstman NB, Schmitz C, Jia F.

   SONOGRAPHIC AND CLINICAL EFFECTS OF BOTULINUM TOXIN TYPE A COMBINED WITH EXTRACORPOREAL SHOCK WAVE THERAPY ON SPASTIC MUSCLES OF CHILDREN WITH CEREBRAL PALSY.
   Picelli A(1), La Marchina E(1), Gajofatto F(2), Pontillo A(1), Vangelista A(2), Filippini R(2), Baricich A(3),(4), Cisari C(3),(4), Smania N(1),(5).

   THERAPEUTIC EFFECT OF EXTRACORPOREAL SHOCK WAVE THERAPY ACCORDING TO TREATMENT SESSION ON GASTROCNEMIUS MUSCLE SPASTICITY IN CHILDREN WITH SPASTIC CEREBRAL PALSY: A PILOT STUDY.
   Park DS(1), Kwon DR(1), Park GY(1), Lee MY(2).

   EFFECT OF EXTRACORPOREAL SHOCK WAVE THERAPY ON GAIT PATTERN IN HEMIPLEGIC CEREBRAL PALSY: A RANDOMIZED CONTROLLED TRIAL.
   El-Shamy SM(1), Eid MA, El-Banna MF.

   EXTRACORPOREAL SHOCKWAVE THERAPY (ESWT) BENEFITS IN SPASTIC CHILDREN WITH CEREBRAL PALSY (CP).
   Mirea A(1), Onose G(2), Padure L(1), Rosulescu E(3).

   EFFECT OF RADIAL SHOCK WAVE THERAPY ON MUSCLE SPASTICITY IN CHILDREN WITH CEREBRAL PALSY.
   Gonkova MI(1), Illeva EM, Ferriero G, Chavdarov I.

   RADIAL EXTRACORPOREAL SHOCK WAVE THERAPY (RESWT) IN THE TREATMENT OF SPASTICITY IN CEREBRAL PALSY: A RANDOMIZED, PLACEBO-CONTROLLED CLINICAL TRIAL.
   Vidal X(1), Morral A, Costa L, Tur M.

   EFFECT OF SHOCK WAVE STIMULATION ON HYPERTONIC PLANTAR FLEXOR MUSCLES IN PATIENTS WITH CEREBRAL PALSY: A PLACEBO-CONTROLLED STUDY.
   Amelio E(1), Manganotti P.
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Levels of Evidence (LoE)
Grades of Recommendations (GoR)

- A: 3
- B: 1
- C: 0
Recommandations

- No limitations as regards the age (GoR A)
- MAS > 1 and GMF between 2 and 4 (GoR A)
- Gastrocnemius muscle mid belly (GoR A)
- US focusing (GoR A)
- No anesthesia (GoR A)
- 1 session per week for 3 consecutive weeks (GoR A)
- 1500 SW/session (GoR A)
- 0.030 mJ/mm² (GoR A)
- Physical therapy: 3 days per week for 4 consecutive weeks, simultaneously to ESWT, consisting of NDT, strengthening and stretching exercises, balance and gait training, potentially orthoses and BoNT-A inj (GoR A)
Shock Waves & Stroke

• 2002 → 2017

• 19 papers
   EFFECT OF SHOCK WAVE THERAPY ON ANKLE PLANTAR FLEXORS SPASTICITY IN STROKE PATIENTS.
   Sawan S(1), Abd-Allah F(2), Hegazy MM(2), Farrag MA(2), El-Den NH(1).

   EFFECTS OF ONE SESSION RADIAL EXTRACORPOREAL SHOCKWAVE THERAPY ON POST-STROKE PLANTARFLEXOR SPASTICITY: A SINGLE-BLIND CLINICAL TRIAL.
   Radinmehr H(1), Nakhosin Ansari N(1), Naghdi S(1), Olyaei G(1), Tabatabaei A(1).

   SYSTEMATIC REVIEW OF ADJUNCT THERAPIES TO IMPROVE OUTCOMES FOLLOWING BOTULINUM TOXIN INJECTION FOR TREATMENT OF LIMB SPASTICITY.
   Mills PB(1), Finlayson H(2), Sudol M(2), O'Connor R(2).

   EXTRACORPOREAL SHOCK WAVE STIMULATION AS ALTERNATIVE TREATMENT MODALITY FOR WRIST AND FINGERS SPASTICITY IN POSTSTROKE PATIENTS: A PROSPECTIVE, OPEN-LABEL, PRELIMINARY CLINICAL TRIAL.
   Dymarek R(1), Taradaj J(2), Rosińczuk J(1).

   THE EFFECT OF RADIAL EXTRACORPOREAL SHOCK WAVE STIMULATION ON UPPER LIMB SPASTICITY IN CHRONIC STROKE PATIENTS: A SINGLE-BLIND, RANDOMIZED, PLACEBO CONTROLLED STUDY.
   Dymarek R(1), Taradaj J(2), Rosińczuk J(3).

   EFFECT OF RADIAL SHOCK WAVE THERAPY ON SPASTICITY OF THE UPPER LIMB IN PATIENTS WITH CHRONIC STROKE: A PROSPECTIVE, RANDOMIZED, SINGLE BLIND, CONTROLLED TRIAL.
   Li TY(1), Chang CY, Chou YC, Chen LC, Chu HY, Chiang SL, Chang ST, Wu YT.

   EFFECTS OF EXTRACORPOREAL SHOCK WAVE ON UPPER AND LOWER LIMB SPASTICITY IN POST-STROKE PATIENTS: A NARRATIVE REVIEW.
   Dymarek R(1), Ptaszkowski K(2), Słupska L(3), Halski T(3), Taradaj J(4), Rosińczuk J(1).

   THE EFFECTS OF EXTRACORPOREAL SHOCK WAVE THERAPY ON STROKE PATIENTS WITH PLANTAR FASCIITIS.
   Kim Tg(1), Bae Sh(2), Kim Gy(3), Kim Ky(3).

   A SINGLE BLIND, CLINICAL TRIAL TO INVESTIGATE THE EFFECTS OF A SINGLE SESSION EXTRACORPOREAL SHOCK WAVE THERAPY ON WRIST FLEXOR SPASTICITY AFTER STROKE.
   Daliri SS(1), Forogh B(1), Emami Razavi S2(1), Ahadi T(1), Madjlesi F(1), Ansari NN(2).

    EFFECT OF RADIAL SHOCK WAVE THERAPY ON PAIN AND MUSCLE HYPERTONIA: A DOUBLE-BLIND STUDY IN PATIENTS WITH MULTIPLE SCLEROSIS.
    Marinelli L(1), Mori L(2), Solaro C(3), Uccelli A(2), Pelosin E(2), Currà A(4), Molfetta L(2), Abbruzzese G(2), Trompetto C(2).
   EFFECT OF SHOCK WAVE THERAPY ON ANKLE PLANTAR FLEXORS SPASTICITY IN STROKE PATIENTS.
   Sawan S(1), Abd-Allah F(2), Hegazy MM(2), Farrag MA(2), El-Den NH(1).

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EFFECTS OF EXTRACORPOREAL SHOCK WAVE THERAPY ON SPASTICITY IN PATIENTS AFTER BRAIN INJURY: A META-ANALYSIS. Lee JY(1), Kim SN(2), Lee IS(1), Jung H(1), Lee KS(1), Koh SE(1).

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USEFULNESS OF RADIAL EXTRACORPOREAL SHOCK WAVE THERAPY FOR THE SPASTICITY OF THE SUBSCAPULARIS IN PATIENTS WITH STROKE: A PILOT STUDY. Kim YW(1), Shin JC(1), Yoon JG(2), Kim YK(2), Lee SC(3).

THE EFFECT OF EXTRACORPOREAL SHOCK WAVE THERAPY ON LOWER LIMB SPASTICITY SUBACUTE STROKE PATIENTS. Moon SW(1), Kim JH, Jung MJ, Son S, Lee JH, Shin H, Lee ES, Yoon CH, Oh MK.

EXTRACORPOREAL SHOCK WAVE THERAPY REDUCES UPPER LIMB SPASTICITY AND IMPROVES MOTRICITY IN PATIENTS WITH CHRONIC HEMIPLEGIA: A CASE SERIES. Troncati F(1), Paci M, Myftari T, Lombardi B.


SPASTICITY AND ELECTROPHYSIOLOGIC CHANGES AFTER EXTRACORPORAL SHOCK WAVE THERAPY ON GASTROCNEMIUS. Sohn MK(1), Cho KH, Kim YJ, Hwang SL.

LONG-TERM EFFECT OF SHOCK WAVE THERAPY ON UPPER LIMB HYPERTONIA IN PATIENTS AFFECTED BY STROKE. Manganotti P(1), Amelio E.
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SBOTE STUDY: EXTRACORPOREAL SHOCK WAVE THERAPY VERSUS ELECTRICAL STIMULATION AFTER BOTULINUM TOXIN TYPE A INJECTION FOR POST-STROKE SPASTICITY-A PROSPECTIVE RANDOMIZED TRIAL.

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Grades of Recommendations (GoR)

A: 3
B: 7
C: 0
Recommandations

- Stroke at least 6 months before *(GoR B)*
- MAS > 1+ *(GoR B)*
- Gastrocnemius muscle and wrist flexors mid belly *(GoR B)*
- US focusing *(GoR B)*
- No anesthesia *(GoR B)*
- 1 session per week for 1 week (?)
- 800-1500 SW/session (?)
- 0.030-0.1 mJ/mm² (?)
- Physical therapy: NO/yes (1 hr sessions, 3 days per week for 6 weeks, strenghtening and stretching exercise, potentially orthoses) (?)
Recommandations

- Stroke at least 6 months before (
- MAS > 1+
- Gastrocnemius muscle and wrist flexors mid belly
- US focusing
- No anesthesia
- 1 session per week for 1 to 3 weeks
- 800-1500 SW/session
- 0.030-0.1 mJ/mm²
- Physical therapy: NO/yes (1 hr sessions, 3 days per week for 6 weeks, strenghtening and stretching exercise, potentially orthoses)
Levels of Evidence (LoE)

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7° I.S.M.U.L.T. Congress Rome 1-2 december 2017
Take-home messages

• Systematic review or meta-analysis as regards children

• RCTs about adults

• Homogeneity of protocols

• Radial Shock Waves ???
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