Robot Assisted Training for the Upper Limb after Stroke (RATULS): a multi-centre randomised controlled trial comparing robot-assisted training; an enhanced upper limb therapy programme; and usual care.


Trial design

Screening/baseline assessment/randomisation
770 adults 1 week to 5 years post stroke with moderate to severe arm functional limitation.

Robot assisted training (RT) (n=257)
Provided for 45 min, 3 days per week for 12 weeks

Enhanced upper limb therapy (EULT) (n=259)
Provided for 45 min, 3 days per week for 12 weeks

Usual care (UC) (n=254)
Participants received usual post stroke care

Three month outcome assessment
1. Upper limb function (Action Research Arm Test)
2. Upper limb impairment (Fugl-Meyer Test)
3. Activities of daily living (Barthel ADL Index)
4. Quality of life (Stroke Impact Scale, EQ-5D-5L)
5. Adverse events including upper limb pain

Six month assessment
Outcome measures as above plus resource usage

Study centres

Queen Elizabeth Hospital, Glasgow (NHS Greater Glasgow and Clyde) 222 participants
North Tyneside General Hospital (Northumbria Healthcare NHS Foundation Trust) 237 participants
Queen’s Hospital, Romford (Barking, Havering and Redbridge University Hospitals NHS Trust) 194 participants
Northwick Park Hospital (London Northwest Healthcare NHS Trust) 117 participants
Results

Upper limb function: ARAT success (primary outcome)

Upper limb impairment: Fugl-Meyer motor score

Activities of daily living: Stroke Impact Scale

Intervention adherence

Median time on robot within RT sessions

Median therapy time within EULT sessions

Total duration on robot for RT programme:
Median 23 hr 28 min [IQR 18hr 53min-25hr 46min]

Total duration of therapy for EULT programme:
Median 24 hr 40 min [IQR 20hr 24min-26hr 15min]
Conclusions

Primary outcome: ARAT success at 3 months
- RT using the MIT-Manus robotic gym (shoulder-elbow, wrist and hand modules) did not improve upper limb function when compared to EULT or UC
- EULT did not improve upper limb function when compared to UC

Upper limb impairment: Fugl-Meyer motor score
- RT and EULT led to improvement in upper limb impairment compared to UC

Activities of daily living: Stroke Impact Scale
- EULT led to improvements in ADL compared to RT or UC

Further information
- For more information please visit: http://research.ncl.ac.uk/ratuls/
- Trial results to be published in The Lancet on 22nd May 2019

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