OT for cognitive impairment in stroke patients: A systematic review

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Outline

- Importance of cognitive rehabilitation
- Rationales of identifying research evidence
- Cochrane systematic review procedure
- Results: evidence that were found
- Discussion

Importance of cognitive rehabilitation

- About 1/3 patients having cognitive impairment
- ↑ risk for depression and dementia
- ↑ dependence in basic ADL & instrumental ADL
- ↑ social costs

OT in cognitive rehabilitation

- Integrating person-occupation-environment relationship
  - Remedial approach
  - Compensatory approach
- Improving patients' functional independence
- Restoring patients' life roles

OT in cognitive rehabilitation

Where is the research evidence?

Research questions

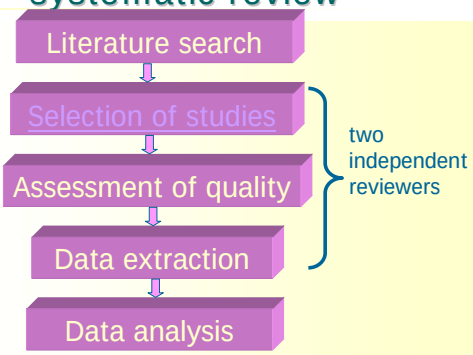
- Any evidence supports OT on functional outcome and cognitive abilities?
- What is the comparison of remedial and compensatory approaches?
- What are the characteristics of interventions?

Need systematically reviewed

Purpose

- To identify research evidence of OT for cognitive impairment
- To compare treatment effect of remedial and compensatory approaches
- To identify characteristics of interventions

Procedure of Cochrane systematic review



Selection of studies

- Selection criteria
  - Randomized controlled trials (RCT)
  - Adult stroke with cognitive impairment
  - Interventions used by OT
  - Functional outcome or cognitive impairment

Selection of studies (1938 - 2006)

Total searched (1631)
⇩
Eliminated from titles or abstracts (1464)
⇩
Ineligible after reading full text (161)
⇩
Eligible RCTs (6)

Overview of included studies

1st Author	Gasparrini	Carter	Schottke	Doornhein	Hu	Tang
Year	1979	1983	1997	1998	2003	2005
Location	USA	USA	Germany	Netherland	China	China
Sample size	30	33	29	12	86	48
Onset length	55-65 wks	< 1 wk	5-7 wks	12-20 wks	3-10 wks	8-10 wks
Mean age	~50Y	~70Y	?	~50Y	~65 Y	~55Y
Intervention	Remedial	Remedial	Remedial	Remedial	Both	Compensatory

Remedial for BADL

- Carter, L. T., Howard, B. E., & O'Neil, W. A. (1983). Effectiveness of cognitive skill remediation in acute stroke patients. American Journal of Occupational Therapy, 37(5), 320-326.
- USA
- 33 stroke: E- 16 (70.5Y); C- 17 (73.4Y)
- Visual scanning: letter cancellation task
- Visual-spatial: match objects
- Time judgment: estimating 1min
  - 30-40 mins/time; 3 times/wk; for 3-4 wks
- No significant effect on both basic ADL(0/1) and time estimation

Remedial for attention & BADL

- Schöttke, H. (1997). Rehabilitation of attention deficits after stroke-Effectivity of a neuropsychological trainingsprogram for attention deficits. *Verhaltenstherapie, 7*, 21-33.
- Germany
- 29 stroke: E- 16; C- 13 (age not reported)
- Exercises for attention training:
  - computer, paper-pencil exercises, and scanning training
  - 13 sessions (duration not clear); in 3 wks
- Significant effect on sustained attention (3/3)
- No significant effect on information processing speed (0/4) and basic ADL(0/1)

Remedial for memory

- Gasparinni, B., & Satz, P. (1979). A treatment of memory problems in left hemisphere CVA patients. *Journal of Clinical Neuropsychology, 1*(2), 137-150.
- USA
- 30 stroke: E- 15 (53.9Y); C- 15 (52.1Y)
- Visual imagery mnemonic technique
  - 2 sessions (duration not clear)
  - 1 follow-up (1 week later)
- Inconsistent effect on short-term memory (1/4)
- No longitudinal effect was found (0/1)

Remedial for memory

- Doornhein, K., & De Haan, E. H. F. (1998). Cognitive training for memory deficits in stroke patients. *Neuropsychological Rehabilitation, 8*(4), 393-400.
- Netherlands
- 12 stroke: E- 6 (51.3Y); C- 6 (51.7Y)
- Mnemonic strategies of “association” and “organization”
  - 2 times/wk (duration not clear); for 4 wks
- Inconsistent effect on short-term memory (1/2)

Compensatory for mobility & general cognition

- Tang, Q. P., Yang, Q. D., Wu, Y. H., Wang, G. Q., Huang, Z. L., Liu, Z. J., et al. (2005). Effects of problem-oriented willed-movement therapy on motor abilities for people with poststroke cognitive deficits. *Physical Therapy, 85*(10), 1020-1033.
- China
- 48 stroke: E- 25 (56.8Y); C- 23 (54.9Y)
- Compensatory cognitive interventions
  - 50 mins/time; 5-6 times/wk; for 8 wks
- Significant effect on mobility(1/1)
- No significant effect on general cognitive function(0/1)

Combination for ADL & general cognition

- Hu, X., Dou, Z., Zhu, H., Wan, G., & Li, J. (2003). The single blind procedure research of cognitive rehabilitation interventions on cognitive deficits in patients with stroke. *Chinese Journal of Clinical Rehabilitation, 7*(10), 1521-1523.
- China
- 86 stroke: E- 44; C- 42 (mean age = 65Y)
- General cognitive training using various remedial exercises and compensatory strategies
  - Attention, orientation, visual special, memory, calculation, executive function, language and communication
  - 45 mins/time; 5 times/wk; for average 7 wks
- Significant effect on basic ADL(1/1) and general cognitive function(1/1)

Summary

Outcome	Type of intervention			Evidence
	Remedial	Compensatory	Both	
Basic ADL	2			×
		1		✓
			1	✓
General		1		×
cognition			1	✓
Attention	1			?
Memory	2			?

Flaws of included studies

- Small sample size (< 35)
  - Carter, Doornhein, Gasparrini, Schottke
- Outcome assessor(s) not blinded
  - Carter, Doornhein, Gasparrini, Schottke
- Lack of instrumental ADL assessment
- Lack of longitudinal follow-up (1M ↑)

Limitations of current research

- Evidence is weak
- Interventions are various and not clear for clinical replication
- Few studies investigated functional outcome
- Longitudinal effect is not known

Further research is needed

Conclusions

- Intensive compensatory or a combination of remedial and compensatory interventions may facilitate basic ADL of stroke patients with cognitive impairment
- Research evidence is extremely insufficient!
- Further high quality RCTs are needed
  - Functional outcome
  - Specific cognitive impairment
  - Long term follow-up

Thank you for your attention!

Questions

Systematic literature search

- Online bibliographical databases
  - Cochrane CENTRAL, OTseeker, PsycBITE, MEDLINE, CINAHL, PsycINFO, Embase
- Citation tracking
- Hand search
- Experts opinion of unpublished studies

Using combinations of ***keywords*** and ***subject headings***

Criteria for selection of studies

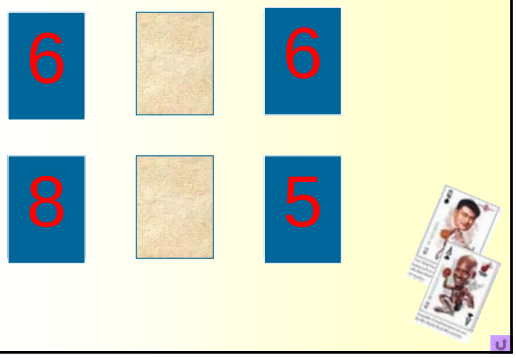
Four criteria

- Type of studies
  - Randomised Control Trials
  - Quasi-randomised trials
- Type of participants
  - Adult (>=18y)
  - Stroke with cognitive impairments

Criteria for selection of studies

- Type of interventions
  - Remedial approach
  - Compensatory approach
- Type of outcome measures
  - Primary: functional assessments
  - Secondary: impairment assessments

Remedial approach



Design – systematic review

- A detailed review that uses explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review
  (The Cochrane Collaboration)

PEDro Internal Validity (scored out of 8)

Criteria	Rating
1. Participants were randomly allocated to groups (in a crossover study, subjects were randomly allocated an order in which treatments were received).	Yes ☐ No ☐ Where:
2. Allocation was concealed.	Yes ☐ No ☐ Where:
3. The groups were similar at baseline regarding the most important prognostic indicators.	Yes ☐ No ☐ Where:
4. There was blinding of all participants.	Yes ☐ No ☐ Where:
5. There was blinding of all therapists who administered the therapy.	Yes ☐ No ☐ Where:
6. There was blinding of all assessors who measured at least one key outcome.	Yes ☐ No ☐ Where:
7. Measures of at least one key outcome were obtained from more than 85% of the participants initially allocated to groups.	Yes ☐ No ☐ Where:

Methods of systematic review

- Assessment of methodological quality
  - PEDro scale (8 internal validity items)
- Data extraction
  - Sample characteristics, details of the intervention, results
- Analysis