Speech and language therapy following stroke – a Cochrane review update

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Background

Evidence-based practice is considered essential to the provision of high quality healthcare and links clinical practice with research evidence regarding the effectiveness of such interventions. Currently randomised control trials (RCTs) are considered the most robust methodology to assess the efficacy of clinical interventions. Systematic reviews are regarded as the best method of synthesizing the findings of RCTs, helping inform decisions about rehabilitation interventions and highlighting current knowledge and potential research priorities[1]. The Cochrane Collaboration is an international non-profit and independent organisation whose function is to disseminate accurate up-to-date information about the effects of healthcare available worldwide. It produces and disseminates systematic reviews of healthcare interventions and promotes the search for evidence in the form of clinical trials and other studies of interventions. It has reportedly had significant impact on practice, research and policy decisions around the world.

In 1999 a Cochrane review was undertaken which evaluated and disseminated the evidence for the rehabilitation of aphasia following stroke[2]. The objective of the review was to assess the effects of speech and language therapy provided by qualified speech and language therapists and also non-professional types of support from untrained providers for people with post-stroke aphasia. Twelve trials were identified as suitable for the review however none of the trials were detailed enough to enable adequate description or analysis. Therefore with the available evidence it was not possible to determine whether formal speech and language therapy was more effective than informal support. The authors concluded that speech and language therapy treatment for people with aphasia after a stroke had not been shown either to be clearly effective or clearly ineffective within an RCT. The review is now being updated in order to provide speech and language therapists with the latest scientific evidence for the rehabilitation of aphasia upon which clinical decisions can be based. Additionally, this information will also help identify current gaps in our knowledge which will in turn inform research.

Main amendments to original review

Following close inspection of the original review and detailed discussion with experienced reviewers some amendments were made to the updated review. Many of the suggested adjustments reflect changes in Cochrane procedures, review style and structure in the time since the publication of the original review and will be presented in detail with the published update. The aim of the update was to examine the effectiveness of speech and language therapy interventions for aphasia following stroke. The review included both randomised and quasi-randomised control trials. The types of intervention were compressed into three broad categories:

1. Speech and language therapy versus no speech and language therapy, where speech and language therapy refers to formal speech and language therapy given by qualified speech and language therapists,

2. Speech and language therapy versus support from volunteers/ non- SLT professionals, where support refers to any kind of emotional, psychological or creative (for example, art or music therapy) intervention provided by volunteers (such as, family members, carers or voluntary support groups) and non-SLT professionals (for example, art or music therapists),

3. Speech and language therapy A versus speech and language therapy B, where therapy A/B refers to speech and language therapy intervention that differs in duration, intensity or frequency of intervention, or in terms of theoretical basis for intervention (for example, cognitive neuropsychological versus psychosocial based intervention).

One article was identified in the original review which does not fall into any of the above intervention categories therefore it will be evaluated separately under,

4. Support from volunteers versus no support or intervention

Outcome measures were refined to a primary outcome measure of functional communication and secondary outcomes, which included other measures of communication:

- receptive and/or expressive language for example, written, oral and gestural,
- psychosocial outcomes,
- patient satisfaction with intervention,
- non-compliance with allocated intervention,
- economic outcomes such as cost to the patient, carers, families, health service and society,
- carer/ family satisfaction.

There were also changes to the search methods for the identification of studies which are discussed below.

Method

Search methods for identification of studies

This review has drawn on the search strategy developed for the Cochrane Stroke Group as a whole. Search strategies from the original review were revised for both Medline and CINAHL by the Cochrane Stroke Group for the years 1999-2007 (see Appendices 1 and 2). Relevant trials were identified in the Specialised Register of Controlled Trials. This register was last searched by the Review Group Co-ordinator for trials relevant to this review in March 2007.

The International Journal of Language and Communication Disorders (formerly the International Journal of Disorders of Communication, European Journal of Disorders of Communication and the British Journal of Disorders of Communication) was searched by hand from 1999 to 2005 and electronically from 2006-2007. Reference lists of all included articles were examined for other possible randomised trials. All universities and colleges where speech and language therapists are trained, as well as Special Interest Groups for adults with acquired neuropathologies within the United Kingdom were contacted to enquire about any relevant published, unpublished or ongoing trials. Additionally, academic researchers, colleagues and authors of randomised trials were approached to identify other relevant studies. The review was conducted using the standard Cochrane software 'Review Manager'.

Assessment of quality of identified papers

Studies identified through the search methods described above numbered 1494 – 381 from electronic searches, 119 from the Cochrane Trials Register and 994 references were checked from hand searches and reference lists from included studies. These articles were examined and 1467 were excluded immediately as being inappropriate for inclusion in this review. The remaining 27 trials were assessed for methodological quality by two assessors independently who were based at different locations. Particular attention was paid to whether there was protection from the following types of bias:

- Selection bias, i.e. true random sequencing and true concealment up to the time of allocation,
- Performance bias, i.e. differences in other types of treatment (co-interventions) between the two groups,
- Exclusion bias, i.e. withdrawal after trial entry,
- Detection bias, i.e. 'unmasked' assessment of outcome.

Five of these 27 trials were excluded. The inclusion criteria for two of the studies accepted people with diagnoses other than stroke such as, Multiple Sclerosis and Parkinson's disease and it was not possible to obtain aphasia specific data. Discussions with one author revealed that their study was not an RCT although the publication reported random allocation of participants. Two studies presented data for overall stroke rehabilitation outcomes but the authors were unable to supply aphasia specific data.

Findings

The original Cochrane review identified 12 RCTs and a further 14 studies have been identified for inclusion in the update (totaling 26 RCTs). An additional eight papers are currently awaiting assessment. Six of these papers are non-English and are in the process of being translated and authors of three papers intend to forward appropriate summary data for inclusion. There are also four ongoing studies which were identified through contact with academic researchers and may be appropriate for inclusion in future updates. A breakdown of the additional 14 included studies is provided in Table 1 below. The table presents the three intervention categories, intervention types, number of RCTs (with the number of arms in each trial where relevant) and the country where the trial took place. As the table indicates some studies have more than one arm (for example, speech and language therapy intervention (SLT) A *versus* SLTB *versus* no SLT therefore these are included in more than one intervention category (for example, SLTA *versus* SLTB as well as SLTA *versus* nothing and SLTB *versus* nothing).

Table 1
Breakdown of RCTs for Cochrane review update

Intervention category	Intervention type	Number of RCTs	Country
Speech and language therapy V No speech and language therapy	Computer mediated	2 (1 with 3 arms)	Netherlands (1) USA (1)
	Group	1	USA (1)
	Conventional	6 (2 with 3 arms)	Netherlands (1) USA (2) UK (2) Italy (1)
Speech and language therapy V Support from volunteers/ non- SLT professionals		4	UK (2) USA (1) Portugal (1)
Speech and language therapy A V Speech and language therapy B	Intensive V Standard	3	UK (3)
	Conventional V other SLT	9	UK (3) USA (4) Netherlands (1) Germany (1)
	Functional V Impairment	1 (3 arms)	USA (1)
	Group V Individual	1	USA (1)
	Semantic V Phonology	1	Netherlands (1)
	Sentence mapping V Unstructured conversation	1	Canada (1)
Support from volunteers Versus Nothing		1	Canada (1)

Meta-analysis?

The review update is now in its final stages of completion and any further identified studies will be held for future updates. The possibility of undertaking a meta-analysis of the data is currently being evaluated as a number of factors need to be taken into consideration. It is important to match similar interventions with similar outcomes, however there was a wide range of interventions and outcome measures used in the RCTs from the original review as well as the additionally identified studies. The various intervention types are listed in Table 1 above. Outcome measures included standardised speech and language assessments ranging from functional communication lists to language batteries, as well as various outcome measures created by the researchers for their specific intervention. The original review reported a paucity of raw summary data and this is echoed to some degree within the additional identified RCTs. Data from more than 50% of the total identified RCTs are either no longer available (mainly older studies) or not in an appropriate format for carrying out the meta-analysis using Cochrane software. The non-English papers are currently being translated which may provide additional data for analysis.

Conclusion

The Cochrane review, Speech and Language Therapy for Aphasia following Stroke (1999)'[2], identified 12 appropriate studies which were included in the review. An additional 14 studies have been identified for inclusion in the review update. These studies have been evaluated for methodological quality by two independent assessors. It is uncertain if a meta-analysis will be possible due to the wide range of intervention types and outcome measures as well as the paucity of appropriate raw summary data. The final analysis is expected to be completed shortly and will be published in the Cochrane Database of Systematic Reviews.

References

1. Cochrane Collaboration http://www.cochrane.org accessed 19th June 2007
2. Greener, J., Enderby, P. and Whurr, R. (1999) Speech and language therapy for aphasia following stroke. Cochrane Database of Systematic Reviews, Issue 4. Art.No.:CD000425. DOI: 10.1002/14651858.CD000425.

Appendix 1
CINAHL Search

1. aphasia/ or aphasia, broca/ or aphasia, wernicke/
2. Language Disorders/
3. (aphasi$ or dysphasi$ or anomia or anomic).tw.
4. ((language or linguistic) adj5 (dosorder$ or impair$ or problem$ or dysfunction)).tw.
5. 1 or 2 or 3 or 4
6. "rehabilitation, speech and language"/ or "alternative and augmentative communication"/ or language therapy?.mp. or exp speech, alaryngeal/ or speech therapy/ [mp=title, subject heading word, abstract, instrumentation]
7. Speech-Language Pathology/ or communication skills training/
8. Speech-Language Pathologists/
9. ((speech or language or aphasia or dysphasia) adj5 (therap$ or train$ or rehabilitat$ or treat$ or pathol$)).tw.
10. 6 or 7 or 8 or 9
11. 5 and 10
12. language disorders/rh, th or aphasia/rh, th or aphasia, broca/rh, th or aphasia, wernicke/rh, th
13. 11 or 12
14. random assignment/
15. random sample/
16. Crossover design/
17. exp Clinical trials/
18. Comparative studies/
19. "control (research)"/
20. Control group/
21. Factorial design/
22. quasi-experimental studies/
23. Nonrandomized trials/
24. Clinical nursing research/ or Clinical research/
25. Community trials/ or Experimental studies/ or One-shot case study/ or Pretest-posttest design/ or Solomon four-group design/ or Static group comparison/ or Study design/
26. "clinical trial".pt.
27. random$.tw.
28. ((singl$ or doubl$ or tripl$ or trebl$) adj25 (blind$ or mask$)).tw.
29. (cross?over or control$ or factorial or sham?).tw.
30. ((clin$ or intervention$ or compar$ or experiment$ or therapeutic) adj10 trial$).tw.
31. (assign$ or alternate or allocat$ or counterbalance$ or multiple baseline$ or ABAB design$).tw.
32. ((control or treatment or experiment$ or intervention) adj5 (group$ or subject$ or patient$)).tw.
33. 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32
34. 13 and 33
35. 34 not child$.ti.
36. limit 35 to yr="1999 - 2007"

Appendix 2
Medline Search

1. exp aphasia/
2. language disorders/ or anomia/
3. (aphasi$ or dysphasi$ or anomia or anomic).tw.
4. ((language or linguistic) adj5 (disorder$ or impair$ or problem$ or dysfunction)).tw.
5. 1 or 2 or 3 or 4
6. language therapy/ or speech therapy/
7. Speech-Language Pathology/
8. ((speech or language or aphasia or dysphasia) adj5 (therap$ or train$ or rehabilitat$ or treat$ or pathol$)).tw.
9. 6 or 7 or 8
10. 5 and 9
11. exp aphasia/rh, th or language disorders/rh, th or anomia/rh, th
12. 10 or 11
13. Randomized Controlled Trials/
14. random allocation/
15. Controlled Clinical Trials/
16. control groups/
17. clinical trials/
18. double-blind method/
19. single-blind method/
20. Multicenter Studies/
21. Therapies, Investigational/
22. Research Design/
23. Program Evaluation/
24. evaluation studies/
25. randomized controlled trial.pt.
26. controlled clinical trial.pt.
27. clinical trial.pt.
28. multicenter study.pt.
29. evaluation studies.pt.
30. random$.tw.
31. (controlled adj5 (trial$ or stud$)).tw.
32. (clinical$ adj5 trial$).tw.
33. ((control or treatment or experiment$ or intervention) adj5 (group$ or subject$ or patient$)).tw.
34. (quasi-random$ or quasi random$ or pseudo-random$ or pseudo random$).tw.
35. ((multicenter or multicentre or therapeutic) adj5 (trial$ or stud$)).tw.
36. ((control or experiment$ or conservative) adj5 (treatment or therapy or procedure or manage$)).tw.
37. ((singl$ or doubl$ or tripl$ or trebl$) adj5 (blind$ or mask$)).tw.
38. (coin adj5 (flip or flipped or toss$)).tw.
39. latin square.tw.
40. versus.tw.
41. (assign$ or alternate or allocat$ or counterbalance$ or multiple baseline).tw.
42. controls.tw.
43. 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42
44. 12 and 43
45. child$.ti.
46. 44 not 45
47. limit 46 to yr="1999 - 2007"