

CAHE JC Critically Appraised Article Summary

Journal Club Details

Date of submission	November 2007
Journal Club location	ECH
JC Facilitator	Philippa Robert
Clinical Scenario	Upper limb splinting in post-CVA patients

Review Question/PICO/PACO

'Is upper limb splinting effective in reducing hypertonicity/contractures in post-CVA community-dwelling elderly patients?'

P	Community dwelling elderly post-CVA (with hypertonicity)
I	Upper limb splinting
C	No splinting
O	Tone, functional grasp & release, functional ability

Article/Paper

Lannin NA & Herbert RD 2003, '*Is hand splinting effective for adults following stroke? A systematic review and methodological critique of published research*', Clinical Rehabilitation, 17: 807-816

Article Methodology:	Systematic Review
Returned JC on:	15 November 2007
By CAHE staff member:	Mat Prior

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Questions No.	Yes	Can't Tell	No	Comments
1	✓			The systematic review asked a clearly-focused question, in that it aimed "To assess the effectiveness of hand splinting on the hemiplegic upper extremity" (p.807). The population of interest was also clearly specified, in that it dealt with adults following stroke.
2	✓			All identified articles representing level 4 evidence or higher were included for review. This means that evidence from case-series, case-control studies, cohort studies, controlled trials, RCTs, systematic reviews and meta-analyses were all eligible for inclusion. Whilst the quality of the identified literature may differ due to the difference in research methodology, the inclusion criteria is considered appropriate. This represented a comprehensive selection of the available literature, thus the authors have attempted to get as big a picture as possible of the evidence for or against hand splinting.
3	✓			A very comprehensive search strategy was used to try and identify all relevant studies (p.808-9). Many databases were searched with clearly defined search criteria, which was then supplemented with hand-search and citation tracking. However, it is not stated as to whether any publication date limits were put on the search strategy, whilst all articles were published in English language.
4	✓			The identified articles were critically appraised according to criteria specified by the American Occupational Therapy Association's Evidence-Based Literature Review Project (Trombly & Haas as cited in Lannin & Herbert 2003), however it appears as if identified RCTs were also appraised according to PEDro criteria. However, it should be noted that whilst RCTs were reportedly dually appraised, appraisal using the American Occupational Therapy Association criteria was done by a single-reviewer, and thus the possibility for reviewer bias exists. Whilst a reference is provided to a paper that reportedly outlines this scale, no information is provided as to how categories of 'high', 'moderate' or 'low' validity are defined according to these criteria.
5				N/A The authors intended to conduct a meta-analysis, however the heterogeneity in design and measurement precluded this.

Review No.	Yes	Can't Tell	No	Comments
6				<p>Overall, it would seem that there is insufficient evidence to justify the use of hand splinting in adult post-CVA patients.</p> <p>21 studies were included in the review, with varying methodological quality. However, almost all were found to have threats to internal validity. External validity was slightly better, however still variable. Of the 5 RCTs, only one was deemed to be of 'high' methodological quality. As such, it may be that the methodological limitations, particularly with respect to the frequency of a lack of no-splint control group, that contribute substantially to the insufficiency of the evidence to justify or refute the use of hand splinting. Interestingly, one study of level 5 evidence was included in the review (single case study), despite this supposedly not being eligible.</p> <p>Only results from the reviewed RCTs seemed to have been considered in detail by Lannin & Herbert (2003). In a study of subjects who were more than 1 year post-CVA (Langlois et al. as cited in Lannin & Herbert 2003), there was no significant difference with respect to hypertonicity between wearing a finger-spreader splint for either 6 or 12-22 hours, however whether the wearing of a splint resulted in any benefit to the patients is uncertain as there was no control group (ie a non-splint group). Similarly, whilst there was no significant difference between dorsal and volar splints in reducing hypertonus (McPherson et al. as cited in Lannin & Herbert 2003), the extent to which either was beneficial is uncertain due to the lack of a control group.</p> <p>However, of the few studies to use a control group (Lannin et al. as cited in Lannin & Herbert 2003), splinting the wrist & hand in the functional position was no better in preventing contracture than stretching.</p> <p>Only one RCT (Rose & Shah as cited in Lannin & Herbert 2003) identified significant outcomes, with volar & dorsal splinting improving passive wrist extension and decreasing hypertonus. However, statistical information for this is not provided, whilst it is not stated as to how long post-CVA this sample was.</p>
7				<p>Of the RCTs discussed in detail within the Results section, those with reported statistical information were all presented in terms of confidence intervals; however none of which displayed significance.</p> <p>Meta-analysis was intended, however was not conducted due to the heterogeneity of the studies.</p>

Study No.	Yes	Can't Tell	No	Comments
8		✓		If attempting to apply these results to the local population, it should be considered that the results from many other identified studies were not presented in detail. Furthermore, for many articles no information is provided about how long post-CVA the sample was, and thus whether it is relevant to a community-dwelling elderly population is uncertain. However, it should be noted that the overall conclusion is that, whilst there is evidence to suggest that it may be ineffective, there is insufficient evidence to justify or refute the use of splinting post-CVA.
9			✓	Consideration of other outcomes was lacking (eg no implications discussed for patients/therapists/policy makers), however this may be due to the conclusion of insufficient evidence. Accordingly, it was concluded that additional good-quality research needed to be conducted.
10			✓	Current practice need not necessarily change as a result of the evidence in this review, as it was concluded that it was insufficient to determine whether splinting was justified or not. Whilst much research has been done, it has often lacked a control group – and thus splinting is compared to an additional treatment, and its effects in isolation are unknown. Whilst the authors report that there is high-level evidence to refute the use of splinting in favour of splinting, it should be noted that this was from one study, and that additional research would need to be conducted to confirm these findings.