TITLE: Augmentative and Alternative Communication Devices as Early Interventions for Young Children: Clinical Effectiveness

DATE: 13 April 2015

RESEARCH QUESTION

What is the clinical effectiveness of augmentative and alternative communication (AAC) devices as early interventions for children up to six years of age?

KEY FINDINGS

Two randomized controlled trials and three non-randomized studies were identified regarding the clinical effectiveness of augmentative and alternative communication devices as early interventions for children up to six years of age.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2015, Issue 3), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled studies and non-randomized controlled studies. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2010 and April 2, 2015. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.
Table 1: Selection Criteria

<table>
<thead>
<tr>
<th>Population</th>
<th>Children up to age six with developmental disabilities (e.g., cerebral palsy, acquired brain injury, intellectual disability etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Augmentative and alternative communication (AAC) devices</td>
</tr>
<tr>
<td>Comparator</td>
<td>Alternate AAC devices or methods</td>
</tr>
<tr>
<td></td>
<td>No intervention</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Clinical effectiveness (improved communication; improved development towards school preparedness)</td>
</tr>
<tr>
<td>Study Designs</td>
<td>Health technology assessment reports, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies</td>
</tr>
</tbody>
</table>

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and non-randomized studies.

Two randomized controlled trials and three non-randomized studies were identified regarding the clinical effectiveness of augmentative and alternative communication (AAC) devices as early interventions for children up to six years of age. No relevant health technology assessment reports, systematic reviews, or meta-analyses were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

Two randomized controlled trials\(^1,2\) and three\(^3,5\) non-randomized studies were identified regarding the clinical effectiveness of Picture Exchange Communication Systems (PECS)\(^1,2,3,5\) and speech generating devices\(^4\) as early interventions for children up to six years of age with autism\(^1,3,5\) or developmental delay.\(^4\)

Overall, the use of PECS was associated with greater improvements in social-communicative skills than conventional language therapy\(^3,5\) and resulted in similar improvements in language skills compared to pivotal response training.\(^1\) Use of PECS was inferior to Responsive Education and Prelinguistic Milieu Teaching for improving object interest.\(^2\) The addition of a speech generating device to augmented language interventions was associated with improved motor movements and language abilities.\(^4\) Detailed study findings are outlined in Table 2.
<table>
<thead>
<tr>
<th>First Author, Publication Year</th>
<th>Population, Sample Size</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Randomized Controlled Trials</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Schreibman, 2014\(^1\)       | - Children with autism (nonverbal or minimally verbal) aged 2 to 4 years  
   - n = 39 | PECS          | Pivotal response training | - Increased spoken language skills observed in both groups  
   - No differences between groups  
   - PECS harder to implement |
| McDuffie, 2012\(^2\)         | - Children with autism aged 18 to 60 months  
   - n = 32 | PECS          | RPMT        | - Greater increase in object interest in the RPMT group |
| **Non-Randomized Studies**    |                          |              |            |          |
| Lerna, 2014\(^3\)           | - Children with autism (nonverbal) of preschool age  
   - n = 14 per group | PECS          | Conventional Language Therapy | - Greater improvements in ADOS severity scores, GMDS Social domain, VABS Social Abilities domains, and several social-communicative variables were observed in PECS group at initial assessment  
   - VABS and social-communicative variable improvements stable at 1 year |
| Whitmore, 2014\(^4\)        | - Toddlers with developmental delays  
   - n = NR | Augmented language intervention plus SGD | Augmented language intervention | - Motor movements more developmentally appropriate and language abilities more accurate in SGD group |
| Lerna, 2012\(^5\)           | - Children with autism of preschool age  
   - n = 18 | PECS          | Conventional Language Therapy | - Greater post-test improvements in VABS and social-communicative variables in PECS group |

ADOS = Autism Diagnostic Observation Schedule; GMDS = Griffiths’ Mental Developmental Scales; NR = not reported; PECS = Picture Exchange Communication System; RPMT = Responsive Education and Prelinguistic Milieu Teaching; SGD = speech generating device; VABS = Vineland Adaptive Behavior Scales.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified

Systematic Reviews and Meta-analyses
No literature identified

Randomized Controlled Trials


Non-Randomized Studies


PREPARED BY:
Canadian Agency for Drugs and Technologies in Health
Tel: 1-866-898-8439
www.cadth.ca
APPENDIX – FURTHER INFORMATION:

Systematic Reviews and Meta-analyses

Unclear Age Range


Alternate Age Range


Randomized Controlled Trials

Unclear Age Range


PubMed: PM19904596

Alternate Age Range

PubMed: PM24839882

PubMed: PM21787048

Non-Randomized Studies

Unclear Age Range

PubMed: PM25344794

PubMed: PM23902408

PubMed: PM24229337

PubMed: PM23952565

PubMed: PM22676327


Alternate Age Range


Review Articles