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Retained Primitive Reflexes and Children with ADHD

Megan Boersen
Western Michigan University, megan.e.boersen@wmich.edu

Olivia Hicks
Western Michigan University

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By: Megan Boersen and Olivia Hicks

Reflex Testing				
	Asymmetric Tonic Neck Reflex (ATNR)	**Symmetric Tonic Neck Reflex (STNR)**	**Moro Reflex**	**Galant Reflex**
Position:	Standing with arms out in front at shoulder length	Table top/four point kneeling.	Head in extension and instructed to fall backwards.	Table top/four point kneeling.
Indicator of Reflex:	Arm movement in direction of head turn, dropping of the arms, and sway or loss of balance	When head is extended, arms straighten and knees bend; when head is flexed, arms bend and feet raise	Flailing of arms, cry or intake of breath, pallor or reddened skin	Outward hip movement in response to brush stroke down back on the same side
Developmental Timeline:	Emerges at birth and is integrated around 3 months	Emerges at 6-8 months and is integrated around 9-11 months	Emerges at birth and is integrated around 6 months	Emerges around 18 weeks and is integrated by 12 months

1 Ask: Research Question

What is the relationship between retained primitive reflexes and children with ADHD?

2a Acquire: Search Terms

Databases: Scopus, PubMed, Clinical Key Keywords: retained primitive reflexes, persisting primitive reflexes, ADHD

2b Acquire: Selected Articles

Konicarova, Bob, & Raboch (2013): A case control study that examined persisting primitive asymmetrical tonic neck reflex (ATNR) and symmetrical tonic neck reflex (STNR) in relation to the diagnosis of ADHD among girls.

Konicarova & Bob (2013): A case control study that analyzed the persistence of ATNR in children and its relation to symptoms of ADHD compared with a control group.

Konicarova & Bob (2012): A case control study that investigated the relationship between retained Moro and Galant primitive reflexes and the diagnosis of ADHD in children.

3a Appraise: Study Quality

Konicarova, Bob, & Raboch (2013): Level 3, N=65. The study compared girls with ADHD to a control group of 30 girls without ADHD. Subject selection control for medication usage. No randomization was used. Not generalizable to other diagnoses. Conner's Parent Questionnaire (CPQ) assessment was reliable and valid.

Konicarova & Bob (2013): Level 3, N=90. The study compared a group of 60 children with ADHD to a control group of 30 children without ADHD. No randomization was used. Not generalizable to other diagnoses. CPQ assessment was reliable and valid.

Konicarova & Bob (2012): Level 3, N= 40. The study compared 20 children with ADHD to a control group of 20 children without ADHD. No randomization was used. Not generalizable to other diagnoses.

3b Appraise: Study Results

The findings of the three studies all suggested that there is a significant relationship between retained primitive reflexes and ADHD in children. The first study showed significant correlations at $p < 0.05$ level for ATNR and anxiety, ATNR and perfectionism, STNR and CPQ, and STNR and impulsivity-hyperactivity. Significant correlations at $p < 0.01$ level were found between ATNR and CPQ, ATNR and impulsivity-hyperactivity, and STNR and learning problems.

The second study showed a significant correlation between ATNR scores and ADHD symptoms measured by CPQ total score ($r = 0.59$, $p < 0.01$). CPQ subscales including anxiety, impulsivity-hyperactivity, learning problems, and conduct problems were significant at $p < 0.01$.

The third study showed Moro and Galant reflexes in children with ADHD were much more prevalent than those reflexes in healthy children. The average score for the Moro reflex in children with ADHD was 0.85 (SD = 0.81), $p < 0.001$, which significantly differed from the average score in healthy children 0.05 (SD = 0.22). The average score for the Galant reflex in children with ADHD was 0.70 (SD = 0.92), $p = 0.01$, which significantly differed from the average score in healthy children 0.10 (SD = 0.44).

4 Apply: Conclusions for Practice

The overall findings supporting the relationship between retained primitive reflexes and ADHD in children can serve an important contribution to the profession of occupational therapy and can guide practice relating to unfinished developmental stages. This information can be used as a resource for occupational therapists to educate parents and caregivers on the current existing evidence. Further research is needed to understand the long term physical and emotional impact on children. Due to limited evidence, additional research is needed to understand the importance of this relationship as it relates to function.

References:

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Konicarova, J., & Bob, P. (2013). Asymmetric tonic neck reflex and symptoms of attention deficit and hyperactivity disorder in children. *International Journal of Neuroscience, 123,* 766-769. doi: 10.3109/00207454.2013.801471

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Yes. Limited evidence supports a relationship between retained primitive reflexes and ADHD in children.

College of Health and Human Services
Department of Occupational Therapy
Western Michigan University