

بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



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Assessment of Balance functions and Primitive Reflexes in Children with Learning Disability

Thesis

*Submitted for Partial Fulfillment of the MD Degree in
Audiology*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدقة الله العظيم

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List of Abbreviations

Abb.	Full term
ADHD	Attention deficit hyperactivity disorder
APD	Auditory processing disorder
ARST	Arabic reading test
ATNR.....	Asymmetrical Tonic Neck Reflex
BSA.....	British Society of Audiology
CANS.....	Central auditory nervous system
CAP.....	Central Auditory Processing
CAPD	Central Auditory Processing Disorder
CDP	Computerized dynamic posturography
CNS	Central nervous system
DLD	Delayed language development
DSM-IV.....	Diagnostic and Statistical Manual of Mental disorder 4 th edition
ENT	Ear, nose and throat
GSI.....	Grason-Stadler Inc
IPI.....	Inter-pulse interval
LD NOS	Learning Disorders Non-Otherwise Specified
LDs	Learning Disabilities
LHRR.....	Labyrinthine head righting reflex
MADST.....	Modified Dyslexia Screening Test
mCTSIB.....	Modified Clinical Test for Sensory Interaction and Balance
NICU	Neonatal intensive care unit
OHRR	Oculo-head righting reflex
PD	Pitch discrimination

List of Abbreviations Cont...

Abb.	Full term
PPS	Pitch pattern sequence
PREF	Preference
SLD	Specific Learning Disorders
SOM	Somatosensory
SOT	Sensory organization test
SPIN	Speech in noise test
STNR	Symmetrical tonic neck reflex
TLR	Tonic Labyrinthine Reflex
VCR	Vestibulocollic reflex
VES	Vestibular
VIS	Visual
VOR	Vestibulo-ocular reflex
VSR	Vestibulo spinal reflex

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ABSTRACT

Background: The aim of the study is to assess balance functions, primitive reflexes in children with learning disability

Subjects and Methods: The present study was conducted on 70 children divided into two groups. Control group consists of 20 normal children and study group consists of 50 children with learning disability divided into two subgroups 40 Dyslexic/CAPD (combined) group & 10 CAPD group, age range from 6.5 to 9 years. They were subjected to vestibular office test (Romberg, unilateral stance, Fukuda stepping test & mCTSIB), computerized Dynamic posturography, oculomotor test using video goggles (saccade & eye tracking test) and clinical diagnostic tests for primitive reflexes.

Results: Combined group had poor balance measured with unilateral stance and SOT score in condition 4,5,6, composite score, visual and vestibular ratio compared to control group. CAPD showed significant instability in eye closed unilateral leg stance. Oculomotor tests didn't show any significant difference in both sub study groups. 67.5 % of the combined group & 70% of the CAPD group have retained primitive reflexes & underdeveloped HRR.

Conclusions: Dyslexic children have poor balance compared to normal children when vision or somatosensory cues are altered or deficient. CAPD children and dyslexics have retained primitive reflexes and underdeveloped posture reflexes indicating poor neurological development. Assessment of balance functions and primitive reflexes should be included within the test battery of CAPD and dyslexics.

Key Words: Dyslexia, CAPD, primitive reflexes, SOT.

INTRODUCTION AND RATIONALE

Learning Disabilities (LDs) are neurobiological disorders in children characterized by an academic functioning that is below the level that would be expected given their age, IQ and grade level in school, and interfere significantly with academic performances or daily life activities that require reading, writing or calculation skills (*Margari et al., 2013*). In Egypt 16.6% of primary school students are at risk for LD (*Ismail et al., 2019*). Dyslexia is the most common LD, accounting for at least 80% of all LDs (*Kohli et al., 2018*).

Dyslexia is characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities, despite adequate intelligence, motivation, and educational opportunities. These difficulties are believed to stem from a deficit in the phonological component of language (*Lyon et al., 2003*).

In addition to impairment in phonological processing, some studies have noted other rather subtle deficits in motor and perceptual domains. Such as manual finger tasks (*Birkett and Talcott, 2012*), balance (*Stoodley and Schmahmann, 2009*), visual vergence (*Bucci et al., 2009*) and eye movements during reading and motor tasks (*Jones et al., 2008; Kronbichler et al., 2009*).