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قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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

Thesis

Submitted for Partial Fulfillment of the MD Degree in Audiology

By

Nancy Metwally Aly

M.B., B.CH, M.Sc Audiology

Under Supervision of

Prof. Dr. Nagwa Mohamed Abdel Monem Hazzaa

Professor of Audiology, ENT Department
Faculty of Medicine Ain Shams University

Prof. Dr. Amany Ahmed Shalaby

Professor of Audiology, ENT Department
Faculty of Medicine Ain Shams University

Prof. Dr. Sahar Mohamed Ahmed Hassanein

Professor of Pediatrics, Pediatrics Department
Faculty of Medicine Ain Shams University

Dr. Ahmed Nabil Khattab

Assistant professor of Phoniatrics, ENT Department
Faculty of Medicine Ain Shams University

Faculty of Medicine
Ain Shams University
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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 4th 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 to9 years. They were subjected to vestibular office test (Romberg, unilateral stance, Fukuda stepping test & mCTSIB), computerized Dynamic posturography, oclumotor 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. Oclumotor 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 defiant. 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).***