بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / هناء محمد علي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: ....

GENETICS, MATERNAL LIFESTYLE AND ENVIRONMENTAL ROlE IN PEDIATRIC INTELLECTUAL DISABILITY

Submitted By

Rana Mahrous Ali Mahmoud

M.B.B.Ch., Faculty of Medicine, Cairo University, 2009
Master in, Medical &Clinical Genetics, Faculty of Medicine,
Ain Shams University, 2016

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Doctor of Philosophy Degree
In
Environmental Sciences

Department of Environmental Medical Sciences
Faculty of Graduate Studies and Environmental Research
Ain Shams University

2022

APPROVAL SHEET

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Acknowledgment

- First of all I thank Allah for his great mercy and help to complete this work.
- I would like to express my endless gratitude to the patients' families, for their great cooperation.
- Words cannot express my deepest gratitude and appreciation to **Prof. Dr. Mohamed Salah Gabal** Professor of Community, Environmental and Occupational Medicine, Faculty of Medicine, Ain Shams University, for his guidance, support, supervision and help throughout the accomplishment of this study.
- I would like to express my endless gratitude and appreciation to **Prof. Dr. Ahmed Esmat Elsayed Shoman,** Professor of Community, Environmental and Occupational Medicine, Faculty of Medicine, Ain Shams University for his keen supervision throughout the work, unlimited support and effort to get the best out of this work.
- It is a great honor for me to take this opportunity to express my most deep respect and appreciation to **Prof. Dr. Amal Mahmoud Mohamed,** Professor of Human Genetics, National Research Center who has been there to guide me throughout my studies. I encountered many challenges during my research. Dr. Amal was always there to provide support and encouragement.
- **Prof. Dr. Mona Sabry Aglan,** professor of Clinical Genetics, Human Genetics & Genome Research

Division, National Research Centre, for offering me generously her expensive time, great help, and kind encouragement

I would like to express my deep gratitude to

- **Assistant prof. Dr. Ola Mohamed Eid,** Professor of Human cytogenetics, Human Genetics & Genome Research Division, National Research Centre.
- **Dr. Engy Assem Ashaat,** Ass. Professor of Clinical Genetics, Human Genetics & Genome Research Division, National Research Centre.

Without their continuous guidance, support, encouragement and assistance, the accomplishment of this work wouldn't have been possible

Finally, I can never forget to express the profound thanks and appreciation to my family, for their great effort and support offered in performing this work.

Rana Mahrous

Abstract

GDD/ID is characterized by significant limitations in intellectual functioning and adaptive behavior, and is frequently associated with developmental delay and various congenital abnormalities. A wide range of environmental factors, in addition to genetic determinants, can affect brain development. Because of the significant clinical and genetic heterogeneity, studying intellectual disability is challenging.

The aim of our study was to determine the possible role of maternal lifestyle and exposure to environmental risk factors in the development of intellectual disability and to detect chromosomal aberrations and/or copy number variants using various cytogenomics techniques in pediatric patients with intellectual disability.

Out of 40 selected patients with GDD/ ID with or without multiple congenital anomalies (MCA). Different cytogenomics techniques conducted on our patients revealed normal karyotype in 39 patient and 1 female patient had abnormal. MLPA subtelomeric screening, and microdeletion/ microduplication screening was done for all patients. Subtelomeric abnormality was detected solely in the patient with abnormal karyotype. Screening for microdeletion/ microduplication for all patients revealed 4

Contents

List of Abbreviations

AAMR's	American Association on Mental Retardation's
AAIDD	American Association on Intellectual and Developmental Disabilities
ADHD	Attention deficit disorder
ADID	Autosomal dominant intellectual disability
ARID	Autosomal recessive intellectual disability
CD	Cognitive disorder
CNVs	Copy number variants
CGH	Comparative genomic hybridization
CMA	Chromosomal microarray
CMV	Cytomegalovirus
DNA	Deoxyribonucleic acid
DS	Down syndrome
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4th edition.

DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th edition.
FA	Folic acid
FAS	Fetal alcohol syndrome
FASDs	Fetal alcohol spectrum disorders
FISH	Fluorescence in situ hybridization
GDD	Global developmental delay
ID	Intellectual disability
IUGR	Intrauterine growth retardation
IQ	Intelligence quotient
ISCN	International System for Human Cytogenetic Nomenclature
LSI	Locus Specific probe
MAPH	Multiplex amplifiable probe hybridisation
Mb	Million base pairs
MCA	Multiple Congenital Anomalies

MLPA	Multiplex ligation dependent probe amplification
MR	Mental retardation
NGS	Next generation sequencing
NS-ID	Non syndromic intellectual disability
NTDs	Neural tube defects
PCR	Polymerase chain reaction
S-ID	Syndromic intellectual disability
SNP	Single nucleotide polymorphism
TORCH	Toxoplasmosis, Others (syphilis, varicella-zoster, parvovirus B19), Rubella, Cytomegalovirus (CMV), and Herpes infections.
WES	Whole exome sequencing
X-CNVs	X chromosome CNVs
XLID	X-linked intellectual disability

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