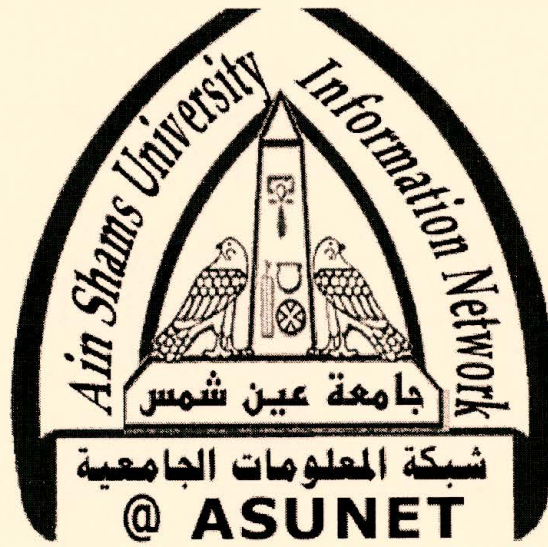




شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

شبكة المعلومات الجامعية
@ ASUNET



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%

بعض الوثائق الأصلية تالفة

شبكة المعلومات الجامعية
@ ASUNET

بالرسالة صفحات لم

ترد بالاصل



شبكة المعلومات الجامعية
@ ASUNET

EFFECT OF HYPERBARIC OXYGEN THERAPY ON CROUCH GAIT

By

MOHAMMED AMEEN AL NATOUR

B.Sc. of Physical Therapy

Faculty of Applied Medical Sciences, Department of Physical Therapy

AL Zahra University- Gaza- Palestine

Thesis

for partial fulfillment of the requirements of

The Master degree in physical therapy

Faculty of Physical Therapy

Cairo University

2007

B
0112

Supervisors

Prof. Dr. AMIRA MOHAMMED AI TOHAMY

Professor in Department of Growth and Development
Disorder in Children and its Surgery,
Faculty of Physical Therapy,
Cairo University

Prof. Dr. LAMIAA MOHAMMED MOHSEN

Professor in Department of Pediatrics,
Faculty of Medicine,
Cairo University

Dr. MANAL SALAH EI DIN ABD EI WAHAB

Lecturer in Department of Growth and Development
Disorder in Children and its Surgery,
Faculty of physical therapy,
Cairo University

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

”قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ“

صدق الله العظيم
سورة البقرة الآية (32)

Acknowledgment

**First and foremost, thanks to ALLAH,
the most gracious, the most Merciful.**

I wish to express my sincere gratitude and deep appreciation to **Prof. Dr. AMIRA MOHAMMED EI TOHAMY**, Professor of Physical therapy .Faculty of Physical Therapy, Cairo University. Advisor and director of this thesis, for her valuable help, support, advice, guidance and effort throughout this work.

It is a great honor to me to express my most sincere and thanks to **Prof. Dr. LAMIAA MOHAMMED MOHSEN**, Professor of pediatrics, Faculty of medicine, for her valuable supervision and kind advices throughout the whole work.

Special appreciation is extended to **Dr. MANAL SALAH EI DIN ABD EI WAHAB**, lecturer of Physical therapy, Faculty of Physical Therapy, Cairo University. She gave me a great deal of her valuable time and effort for this work. Her comments, guidance and reviewing were very helpful to me.

I can not find words to express my thanks to all my professors and colleges in the department of growth and development disorders in children and its surgery, for their unlimited help and support.

No expression could ever reveal my deep appreciation and thanks to **Dr. HAMDY EMAM**, head of hyperbaric oxygen therapy at Nasser Institute Hospital for his unlimited help and support.

I would like to thank the staff members of the Motion analysis lab for their efforts and help.

Last but certainly not least, I am very thankful to my patients and their parents for their active participation in this work.

Dedication

TO MY BELOVED
PARENTS,
MY SINCERE BROTHERS
AND FRIENDS

Effect of Hyperbaric Oxygen Therapy on Crouch gait / Mohammed Ameen AL Natour; supervisors: Prof. Dr. AMIRA MOHAMMED Al TOHAMY, Faculty of Physical Therapy. Prof. Dr. LAMIAA MOHAMMED MOHSEN, Faculty of Medicine. Dr. MANAL SALAH El DIN ABD El WAHAB, Faculty of Physical Therapy, Cairo University, Master Thesis.

Abstract

Back ground: The purpose of this study was to examine the effect of hyperbaric oxygen therapy on crouch gait. Thirty spastic diplegic children were assigned randomly into two groups (study and control). Subjects in the study group (n = 15) received traditional physical therapy program (stretching, strengthening, balance and gait training exercises) only, whereas subjects in the control group (n = 15) received the same traditional physical therapy program in addition to hyperbaric oxygen therapy. Gait parameters including hips, knees and ankles joints excursion during initial contact phase, step length (meters), gait velocity (meter/second) and cadence (steps/minutes) were measured before, one month and after three months of treatment program by 3D motion analysis. **Results:** There was a statistically significant improvement in both groups regarding all the measured variables and a statistically significant difference among both groups in favor to the study group. **Conclusion:** Physical therapy program in addition to hyperbaric oxygen therapy are effective in improving crouch gait in spastic diplegic children.

Key words: Cerebral Palsy, Crouch gait, 3-d Motion analysis, Hyperbaric Oxygen Therapy.

Contents

Chapter I:	page
Introduction	1
Statement of the problem	4
Purpose of the study	4
Significance of the study.....	4
Delimitations	4
Limitations	5
Basic assumptions	5
Hypothesis.....	5
Chapter II:	
Literature Review.....	6
Cerebral Palsy.....	6
Classification of cerebral palsy.....	9
Clinical manifestations of cerebral palsy.....	15
Treatment of cerebral palsy.....	16
Spastic diplegia.....	21
Diagnosis and clinical picture of spastic diplegia.....	23
Gait Development.....	26
Maturation of walking in children.....	27
Gait cycle.....	28
Gait abnormalities in cerebral palsy.....	30
Abnormal gait pattern in spastic diplegia.....	32
Crouch gait.....	33
Causes of crouch gait.....	34
Description of crouch gait.....	35
Muscle behavior during crouch gait	36
Gait analysis.....	38
Quantitative gait evaluation	39
Evaluation systems of temporal parameters of gait.....	39
Evaluation systems of spatial parameters of gait.....	40

Hyperbaric Oxygen Therapy	43
Indications of hyperbaric oxygen therapy.....	44
Contraindications of hyperbaric oxygen therapy.....	45
Side effects of hyperbaric oxygen therapy.....	46
Evaluation before apply of hyperbaric oxygen therapy.....	46
Administration of hyperbaric oxygen therapy.....	47
Beneficial effects of hyperbaric oxygen therapy.....	49
Therapeutic effects of hyperbaric oxygen therapy.....	50
Physiological effects of hyperbaric oxygen therapy.....	51
Effect of hyperbaric oxygen therapy on cerebral palsy.....	52
Effect of hyperbaric oxygen therapy on spastic diplegia.....	56
Chapter III:	
Subjects and procedures	58
Subjects.....	58
Procedures	59
Data analysis	83
Chapter IV:	
Results	84
Chapter V:	
Discussion	134
Chapter VI:	
Summary	149
Conclusion and Recommendations	151
References	153
Appendices.....	171
Arabic Summary	

List of Tables

Number	Table	Page
Table (1):	Cerebral palsy classification according to severity	14
Table (2):	Multispecialty Management Team for Children with C.P	16
Table (3):	Sex distribution for study and control groups	86
Table (4):	General characteristics of both study and control groups	86
Table (5):	Comparison between mean values of step length, cadence and speed before and after one month of treatment for control group	89
Table (6):	Comparison between mean values of right and left hip joint angle during initial contact phase before and after one month of treatment for control group	92
Table (7):	Comparison between mean values of right and left knee joint angle during initial contact phase before and after one month of treatment for control group	92
Table (8):	Comparison between mean values of right and left ankle joint angle during initial contact phase before and after one month of treatment for control group	93
Table (9):	Comparison between mean values of step length, cadence and speed after one month and after three months of treatment for control group	95
Table (10):	Comparison between mean values of right and left hip joint angle during initial contact phase after one month and after three months of treatment for control group	98
Table (11):	Comparison between mean values of right and left knee joint angle during initial contact phase after one month and after three months of treatment for control group	99
Table (12):	Comparison between mean values of right and left ankle joint angle during initial contact phase after one month and after three months of treatment for control group	99
Table (13):	Comparison between mean values of step length, cadence and speed before and after one month of treatment for study group	101