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Evaluation of Herbal Nutritional Intervention for Children with Down Syndrome

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٢٠٠٧

بسم الله الرحمن الرحيم

"و قل اعملوا فسيرى الله عملكم

و رسوله و المؤمنون"

صدق الله العظيم

سورة التوبة: آية ١٠٥

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Abbreviations

a.	Acid
AA	Arachidonic Acid
AAP	American Academy of Pediatrics
ADHD	Attention Deficit and Hyperactivity Disorder
AFP	Alfa-Fetoprotein
AIDS	Acquired Immune Defficiency Syndrome
ALC	Acetyl-L-carnitine
B١٥	Pagnamic Acid
BHP	British Herbal Pharmacopoeia
BMI	Body Mass Index
Ca	Calcium
CAM	Complementary and Alternative Medicine
CBC	Complete Blood Picture
CBS	Cystathione Beta Synthase
Cr	Chromium
Cu	Copper
DHA	Docosahexaenoic acid
DMG	Dimethylglycine
DNA	Deoxyribonucleic Acid
DS	Down Syndrome
EEG	Electroencephalogram
EFA	Essential Fatty Acid
EPA	Eicosapentaenoic Acid
F	Fluoride
f.a.	Fatty Acid
Fe	Iron
FDA	Food and Drug Administration
GART	Glucinamide Ribonucleotide Formyltransferase
GIT	Gastrointestinal Tract
GLA	Gamma-Linolenic Acid
GRAS	Generally Recognized As Safe
HCG	Human chorionic gonadotropin
HDL	High Density Lipoprotein
٥-HTP	٥-Hydroxytryptophan
I	Iodine
Ig	Immunoglobulin
IQ	Intelligence Quotient
LA	Linoleic Acid
LDL	Low Density Lipoprotein
LNA	Alpha-Linolenic Acid
MAC	Midarm Circumference
Mg	Magnesium
Mn	Manganese
NCCAM	National Center for Complementary and Alternative Medicine
NCTR	National Center for Toxicological Research

NGF	Nerve Growth Factor
OFC	Occipital Frontal Circumference
OT	Occupational therapy
PABA	Para-Amino Benzoic Acid
PC	Phosphatidylcholine
PS	Phosphatidylserine
PSO	Pumpkin Seed Oil
RDA	Recommended Daily Allowance
RNA	Ribonucleic Acid
SAMe	S-adenosyl-L-methionine
SB٥	Stanford-Binet Intelligence Scales
Se	Selenium
SFT	Skin Fold Thickness
SOD١	Superoxide Dismutase
T٤	Thyroxin
TMG	Trimethylglycine
uE٣	Unconjugated estriol
WHO	World Health Organization
Zn	Zinc

Abstract

"Evaluation of Herbal Nutritional Intervention in Cases of Down Syndrome"

Sameh Ali Hassan ,Omar El-Sayed El-Shorbagy ,Magdi Karam El-Din Ali , Maisa Nasr Farid.

Aim of the study is to evaluate the nutritional intervention and using of phyto-therapy containing some vitamins and minerals to children with Down syndrome by providing optimal nutrition for these children .

Methdology The study included ٣٠ cases with Down syndrome and ٣٠ controls. All subject were subjected to: Complete history, complete medical and neurological examination, IQ , nutritional and language assessment. A program of nutritional herbal intervention was done for the cases for ٦ months.

Results The intervention group showed improvement in blood picture as the percentage of cases who had no hematological disorder increased from ١٣,٣٪ to ٦٠٪ after the intervention program. Also there was a significant increase (P≤٠,٠٠١) in the head circumference, weight, height, mid-arm circumference, body mass index and IQ after the intervention program than before. There was a significant difference (P≤٠,٠٥) before and after the intervention program as regard the skin fold thickness; height, and body mass index. Cases in the intervention group were improved as regard the speech {language}disorders, before the intervention program ٤٠٪ complained of no-speech {delayed speech} which decreased to ٣٣٪ after the intervention program.

Conclusion It could be concluded that children with Down syndrome could be prevented or treated by with the suitable multivitamins mega doses, amino acids, polyunsaturated fatty acids, and trace elements early in childhood is very essential and important for the improvement of the physical and cognitive status of the patient.

Introduction

Children with special health needs must have the opportunity to achieve their potential in all areas of development. Appropriate nutrition services are a critical aspect of the support required for this to occur. Children with special health needs are vulnerable to all of the factors that place other children at nutritional risk, and to a myriad of additional biological, environmental, and psychosocial variables that may further jeopardize their nutritional status and pose barriers to their development. ***(Lichtenwalter et al., ١٩٩٣).***

Down syndrome is characterized as a chromosomal disorder, resulting in mental retardation and physical abnormalities. Persons born with Down syndrome have an extra chromosome, making three of a kind, known as trisomy. Of all Down syndrome cases, ٩٥٪ are caused by trisomy ٢١. People with this type of trisomy disorder generally live until their ٣٠s or ٤٠s ***(Conners et al., ٢٠٠١).***

Down syndrome is one of the most frequent congenital multiple handicaps, occurring in one to two a systemic acceleration of the aging process. Research shows that prevention can begin prior to birth. In the American Journal of Clinical Nutrition, it was reported that mothers of children with Down syndrome have genetic and biochemical evidence of abnormal maternal folate metabolism. The FDA's National Center for Toxicological Research (NCTR) now recommends that women start supplementing with folic acid ٢ months prior to trying to conceive ***(James et al., ١٩٩٩)***.

The physiological and neurological problems of people with Down syndrome may be partially due to the resulting oxidative damage. Antioxidant supplementation may be valuable to Down syndrome patients, and regular tests can help monitor the amount of tissue damage caused by oxidation ***(Burger et al., ١٩٧٣).***

Early studies show that multiple vitamin deficiencies can be present for long periods of time in patients with Down syndrome ***(Williams et al., ١٩٨٥).***

In other studies, children with Down syndrome who were supplemented for the first three years of life with a combination of vitamin B٦ and ٥-hydroxytryptophan

improved in social maturity and accomplishment . Down syndrome patients would generally benefit by the daily consumption of a multinutrient formula, to compensate for weak metabolic functioning and the likelihood of malabsorption. Recommended dosage would be just slightly below the adult dosage ***(Coleman et al., ١٩٨٥).***

It is believed that the failure of the brain to develop, especially the hippocampal region (controlling memory), may be caused by vital nutrient deprivation. Proper nutrient assimilation combined with cell therapy has increased brain growth in some Down syndrome patients .Addressing immune dysfunction is a crucial component of any Down syndrome protocol. Simply ensuring proper nutrient assimilation can be very effective at improving host defense mechanisms ***(Tyrrell et al., ٢٠٠١)***.

Trisomy ٢١, more commonly referred to as Down syndrome , it is a genetic disorder which is present in approximately ١ out of every ٧٠٠ live births. It results in three number ٢١ chromosomes, as opposed to the normal two .The diagnostic clinical features of this condition are usually readily evident, even at birth. Down syndrome is a leading cause of mental retardation, the mental retardation is severe , virtually all patients with trisomy ٢١ older than ٤٠ years of age develop neuropathologic changes characteristic of Alzheimer's disease, a degenerative disorder of the brain. Patients with Down syndrome have abnormal immune responses that predispose them to serious infections, particularly of the lungs, to thyroid autoimmunity, and an increased susceptibility to leukemia ***(Cotran et al., ١٩٩٩) (Van Dyke et al., ١٩٩٠).***

Nutrition interventions are often related to feeding, including mechanical and behavioral aspects of the processes by which food is provided and intake occurs. For some children, improved nutrition is the factor most critical for survival, for others it can reduce the potentially debilitating effects of their conditions. ***(Cross-McClintic et al., ١٩٩٤)***.

The nutritional status of Special Health Care Needs Children is influenced by a complex of factors that necessitate interdisciplinary interaction for assessment and intervention ***(Baer et al., ١٩٩١)***.

Numerous studies have shown poor lipid metabolism in Down syndrome. Omega ٣ and omega ٦ fatty acids are decreased . Cholesterol is often increased without a

concomitant increase in cardiovascular risk . Apolipoproteins E is abnormal and may contribute to the increased Alzheimer risk in Down syndrome ***(Burger et al., ١٩٧٣).***

Docosohexaenoic acid (DHA) is decreased in Down syndrome individuals . There is good data to show improvements in brain and retinal development in children supplemented with DHA ***(Mann et al., ١٩٩٠).***

There are many potent antioxidants available in brightly colored fruits and vegetables. The food pigments themselves are often antioxidants. Examples include orange colored "beta-carotene" in carrots and squash ,red "lycopene" in tomatoes and watermelon, green "lutein" in dark leafy greens ,red/blue"anthocyanins" in blueberries and beets, and white/yellow "flavones" in onions and garlic. This class of substances is usually called "phytochemicals". Many vegetables and fruits have a wide variety of phytochemicals that have benefits in addition to the antioxidant content, so children's diets should be as generous in these foods as possible . ***(Cloud , ٢٠٠١)***.

For thousands of years medicinal plants (Phytotherapy) have been at the core of alleviating human suffering and promoting health and well-being through the use of common plants. ***(Benton et al., ١٩٨٨).***

In recent times, a great deal of emphasis has been placed on the importance of adequate vitamin intake to overall health and the prevention of disease. This emphasis, and preliminary research linking vitamin supplementation to improvements in IQ in non-handicapped school children and mentally retarded children ***(Harrell et al., ١٩٨١)*** have led many parents to administer large doses of vitamins to their children with DS. hoping to maximize their IQ. ***(Yudkin, ١٩٩١)***.

Hypothesis:

Preventive nutrition services, as well as intervention for identified problems, can help assure a well-nourished child who is healthy, can participate in education and therapy programs, and is better able to function in almost all activities of daily life.

Aim of the study:

The aim of the present study is to evaluate the nutritional intervention and the use of phyto-therapy (herbal medicine) containing some vitamins and minerals to children with Down syndrome by providing optimal nutrition for these children .