Medical Studies Department

Cognitive Function in a Sample of Egyptian Short Stature Children and Adolescents in Relation to Serum Zinc Level.

Thesis Proposal

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(Child Health and Nutrition)

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الملخص

دراسة القدرات المعرفية و نسبة الزنك في الدم في الأطفال و المراهقين المصريين قصار القامة

المقدمة:

يعد نقص الزنك مشكلة تواجه الشعوب على مستوى العالم، و في مصر على الأخص لوحظ وجود هذا النقص في قصار القامة. و لقد أثبتت الأبحاث حتى الآن وجود علاقة بين نقص الزنك و قصر القامة في الأطفال بالإضافة إلى تأثر تطور قدراتهم المعرفية.

هدف البحث:

يهدف البحث الى دراسة القدرات المعرفية في الأطفال و المراهقين المصريين قصار القامة و معرفة مدى علاقة ذلك بنسبة الزنك في الدم.

منهجية البحث:

تم اجراء دراسة مقطعية على عينة عشوائية شملت مئة طفل تتراوح أعمارهم من 6 الى 16 سنة في زيارتهم الأولى لعيادة قصار القامة بالمعهد القومي للتغذية بالقاهرة. تم اجراء الفحص الاكلينيكي و اخذ قياسات الطول و الوزن و التاريخ المرضي و ذلك لاختيار الاطفال ذوي قصر القامة المتناسب و تم استبعاد الاسباب المرضية لقصر القامة و الاطفال اللذين يتناولون علاجا للقصر او اي ادوية اخرى قد تؤثر على النمو. تم ايضا أخذ البيانات الأجتماعية وعمل تحليل غذائي لنسبة الزنك بالاضافة الى إجراء اختبار وكسلر لذكاء الأطفال. تم ايضا سحب عينة دم لفحص نسبة الزنك في الدم.

النتائج:

أظهرت النتائج أن تسعة بالمئة فقط من اللأطفال يحصلون على حاجتهم من الزنك من الغذاء و واحد و ثلاثون بالمئة يعانون من نقص الزنك بالدم. لم تتواجد دلالة احصائية بين نوع الطفل وحجم الأسرة و مستواها الأجتماعي مع مستوى الذكاء و الطول و مقدار الزنك في الغذاء لدى الأطفال بينما اظهرت نسبة الزنك في الدم دلالة احصائية مع نفس المتغيرات السابقة. كما أظهر كل من الذكاء الكلي و اللفظي و العملي بالاضافة الى الإختبارات الفردية للقسمين اللفظي و العملي دلالة احصائية مع طول الطفل و مستوي الزنك في كل من الدم و الغذاء للطفل.

التوصيات:

في ضوء هذا البحث تم اقتراح التوصيات الآتية:

- الحاجة إلى أبحاث مستقبلية تشمل عينة أكبر من الأطفال قصار القامة بمختلف مستوياتهم الإجتماعية و دراسة فائدة إعطاء هؤلاء الأطفال معدن الزنك سواء كدواء أو كطعام لدراسة تأثير ذلك على نموهم الطولي و قدراتهم المعرفية.
- عمل أنظمة فعالة للفحص الدوري لأطفال المدارس لتشخيص حالات قصر القامة و متابعتها في عيادات متخصصة للأطفال قصار القامة.
- عمل برامج لتوعية المجتمع بمشكلة قصر القامة و أهمية الغذاء السليم.
- ادخال الزنك في برامج تغذية الأطفال في المدارس و دراسة بدائل لأطعمة مختلفة تحتوي على الزنك في برامج التغذية على مستوى الأمة.

الخلاصة:

نقص الزنك و قصر القامة لهما تأثير واضح في مستوى ذكاء الاطفال.

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LIST OF ABBREVIATIONS

ATP	Adenosine Triphosphate
BMI	Body Mass Index
DNA	Deoxyribonucleic Acid
ECM	Extracellular Matrix
EDHS	Egypt Demographic Health Survey
EGP	Epiphyseal Growth Plate
FAO	Food and Agriculture Organization
FSIQ	Full Scale Intelligence Quotient
GH	Growth Hormone
GHRH	Growth Hormone Releasing Hormone
HAZ	Height for Age Z score
ICCIIDD	International Council for the Control of Iodine Deficiency Disorders
IGF-1	Insulin-like Growth Factor 1
IGFBP-3	Insulin-like growth factor-binding protein 3
INACG	International Nutritional Anemias Consultative Group
IQ	Intelligence Quotient

IVACG	International Vitamin A Consultative Group
IZiNCG	International Zinc Nutrition Consultative Group
MMPs	Matrix Metalloproteinases
mRNA	Messenger Ribonucleic Acid
NNI	National Nutritional Institute
PIQ	Performance Intelligence Quotient
SD	Standard Deviation
U/L	Upper limb/ Lower limb
UNICEF	United Nations International Children's Emergency Fund
VIQ	Verbal intelligence Quotient
WHO	World Health Organization
Zn	Zinc

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Introduction

Growth assessment is an essential component of pediatric health surveillance and is an indicator for overall wellbeing. Many biophysiologic and psychosocial problems can adversely affect growth. By monitoring children over time, pediatricians can observe the interrelationships between physical growth and cognitive, motor, and emotional development. An aberrant growth may be the first sign of an underlying problem ***(Keane, 2007).***

Short stature is the most prevalent worldwide nutritional problem ***(Watkins et al., 2001).*** So short stature prevalence can, to great extent, reflects nutritional status of a community, of special concern school children and adolescents, therefore it can be used as a sensitive indicator for chronicity if nutritional deprivation in a society ***(Rivera et al., 2003).***

There is great disparity in geographical distribution of short stature between developing and developed countries. The corresponding figures were 57% in Burundi, 52% in India, 32% in China, 37% in Sub-Saharan, 23% in South Africa, 17% in United Arab Emirates and in Jordan 15%. While on the other hand in developed countries, as United States of America it does not exceed 2% ***(UNICEF, 2002).***

While in Egypt the prevalence of short stature was 69.3% in males and 67.6% in females **(National Nutritional Institute 2002)** in collaboration with **UNESIF**.

It is well established that children with short stature frequently have problems in cognitive development, personality, self-esteem and social relations and can't face the normal experiences that correspond to their actual age if compared to other children with normal stature ***(Molinari etal., 2002).***