Study of Physical Growth Pattern in Thalassemic Children And Adolescent in Hawler Thlassemia Center /Erbil City

Kareema Ahmed ussein **Nazar Ramadhan Othman * ***

*** Kaify Jamil Qadir

الخلاصة

خلفية البحث : ثلاسيميا من أكثر الأمراض الوراثية شيوعا في العالم ومن المضاعفات التي تلاحظ المصابين هو ضعف النمو البدني لدى ألاطفال المصابين بالثلاسيميا

الهدف : تهدف الدراسة للتعرف على نمط النمو البدني(الجسمي) لدى الأطفال المصابين بالثلاسيميا ومقارنتها بالأصحاء من طلبة المدارس الثانوية لمدينة اربيل

المنهجية :أجريت دراسة في مركز هولير للثلاسيميا للفترة من 30-2-2012 الى 2012-9-2012 اختيرت عينة من خمسون طفل مصاب بالثلاسيميا ومائتان طالب سليم معافى من طلاب المدارس الثانوية لمدينة اربيل **تم** تصميم استمارة استبيان تتضمن جزئين **لجمع** البيانات **من خلال استخدام أداة** الاستبيان **باعتماد** تقنيات **المقابلة المباشرة** كوسيلة **لجمع** البيانات **وقد تم** تحليل البيانات **عن** طريق **برنامج** SPSS **الإصدار** 17.

ألنتائج :اظهرت النتائج بوجود فرق في أنماط النمو البدني(الجسمي) لدي الأطفال المصابين بالثلاسيميا ومقارنتها بالأطفال الأصحاء من طلبة المدارس

الاستنتاجات : بينت نتائج الدراسة فيما يخص العمر وعلاقته بالطول بوجد وسط حسابي عالي لدى طلبة المدارس عند الوقوف والجلوس وكذلك عند الوزن والكتلة العضلية لجميع الفئات العمرية عند مقارنتها الأطفال المصابين بالثلاسيميا

التوصيات : . اوصت الدراسة بان مرض الثلاسيميا احدى المشاكل الصحية لدى الاطفال فان التخطيط الصحي لغرض تقليل نسبة حالات الاصابة وبرامج التحري عن المرض اضافة الى التوعية الصحية للأفراد المجتمع

Abstract

Background :Thalassaemia is one of the most common genetic blood disorders in the world. Growth impairment is a common observable complication and usually found a growth retardation in those patients

Objectives: The study aimed to identify the Physical growth pattern of Thalassemic(case group) with healthy school(control group) children and adolescents in Erbil city.

Methods: A study was carried out at Hawler Thalassemia Center in Erbil City during the period from the 1-2-2012- to 30-9-2012 . Fifty Thalassemic children(case group) from Hawler Thalassemia Center in Erbil City and two hundred healthy school(control group) children and adolescents were selected . A questionnaire was designed that composed of two parts to deal with physical growth pattern the data were collected by searchers to interviewed the participants in Hawler Thalassemic Center and secondary schools, for children and adolescents in Erbil city and the data were the analysis by using the (SPSS, 17),

Results: The results found that the range of age in the study sample was between 8-11 years old ,which present in healthy school children and adolescents (control group) (46.5%), while in Thalassemic children(study group) was (52.0%),the highest percentage of gender in both groups were male (65.5% , 58.0%) respectively revealed that there was significant differences incomparative physical growth pattern between Thalassemic and healthy children and adolescents

Conclusion : The study conclude that Thalassemic children (Case group) regarding the age they have high mean score than control group (healthy child) in (sitting and standing) height , weight and nutritional status as BMI in all age groups.

Recommendation: The study recommended that Thalassemia was a important health problem in pediatric and plans need to set up to reduce the number of cases born by development of population screening programmer and awareness creating.

Key words: Thalassaemia, growth retardation, height, weight and growth pattern.

***PhD. Pediatric Nursing, Assistant Professor , Pediatric Nursing Unit, College of Nursing, Hawler Medical Universityl**
****M.Sc. Pediatric Nursing, Assistant Lecture, Pediatric Nursing Unit, College of Nursing, Hawler Medical University**
*****M.Sc. Pediatric Nursing, Assistant Lecture, Pediatric Nursing Unit, College of Nursing, Hawler Medical University**

Introduction:

Thalassemia is one of the most common human genetic diseases in the world and it cause many problems for patients, families and health care system [(1)] and it can't be prevented because they're inherited can passed on from parents to their children. Resulting anemia is usually severe with several health problems like enlarged spleen, bone deformities, fatigue and requires regular life-long transfusion, therapy and medical supervision.Iraq is one of the countries in which 6-10% of the populations have hemoglobinopathy of which thalassaemia is a major part"[(2)]There are over 2,000 cases of thalassemia in the Kurdistan Region and Kirkuk.. In Kurdistan region a round 30000 people are carries of β-Thalassaemia. HawlerThalassaemia center serves about 493 regular registered patients , a daily attendance to follow up and to have blood transfusion of about 20-25 patients per day [(3).]Thalassemia is widely distribution in Iraqi with high prevalence rate .growth retardation is one of complication in thalassemia , There are no studies available on the growth patterns in thalassemic children in Kurdistan region . modern medical therapy allow the Thalassemic children to grow normally in first decade of life but growth retardation was continues to be observed in significant proportion in those patients 8888

Growth retardation in thalassemic patients can occur as early as the first or second year of life but these abnormalities are more apparent after 6 to 8 years[(4)]. Regular blood transfusion followed by iron chelation therapy is just a supportive treatment for those patients, which is associated with serious complications. The beneficial effects of regular transfusions on growth and bone disorders in patients with thalassemia were first reported in 1965 [(5)]. Thalassemia is a chronic disease that presents a range of serious clinical challenges. The effects of thalassemia on physical health can lead to physical deformity, growth retardation, and delayed puberty[(6).]in Indian study reported that thalassemic patients are short, have low rate of growth and BMI which is related to low hemoglobin and high ferritin levels and sub-optimal iron chelation therapy. In developing countries, poor socio- economic background compounds the problem [(7)] .Additionally iron-deficiency anemia has a negative effect on physical growth. There was no studies of physical growth pattern of Thalassemic children in Erbil city

This study was aimed to:

1. Identify the physical growth pattern of Thalassemic patient(case group) and healthy school(control group) children and adolescents
2. Compare the physical growth pattern between Thalassemic patient and healthy children and adolescents (secondary schools) with their age and gender .

Subjects and Methods

Study Design And Sample A cross – sectional descriptive study were carried out at three public(governmental) secondary schools and Hawler Thalassemic Center in Erbil city during the period from1-2-2012 to 30-12-2012).This study was conducted in (50) Thalassemic children and adolescents (58.0%) males and (42.0%) females , receiving regular blood transfusions and subcutaneous desferrioxamine therapy and (200 healthy school) children and adolescents (65.5%) male and (34.5%) female from public secondary schools. To identfiy the physical growth pattern between Thalassemic and healthy school children and adolescents with their age and gender. A questionnaire was designed that composed of two parts to deal with physical growth pattern,part I consist : demographic information of the study samples such as (age and gender) , and part II consist physical growth measurement questions such as (standing height , sitting height ,weight and nutritional status as body mass index).

Anthropometrical Methods The physical growth parameters of thethalassemic children and adolescents, weight, standing heigh and sitting height were measured by standard scales and standardized stadiometers. Body mass index (BMI) was calculated according to the formula weight in kg=height in m2. Weight, height and BMI for age and sex was calculation in boys and girls, in Hawler Thalassemic Center/ Erbil and secondary schools to measured height and weight in a private area which done by searchers.

Procedure: The searchers interviewed participants in Hawler Thalassemic Center and these schools in Erbil city.In school ,those agreeing to participate were instructed how to complete the questionnaire sheet by the interviewers. Participants self-completed the questionnaire sheet and returned it , and in Hawler Thalassemic Center/ Erbil the researcher complete the questionnaire sheet by the interviewers Thalassemic children .

Statistical Methods: All the analysis of the results were performed by using the (SPSS, 17), depended on the Body Mass Index (BMI) for age and sex for boys and girls.

Ethical consideration:For the purpose of this study a written official permission has been obtained from College of Nursing / Hawler Medical University ,Ministry of Education and secondary schools . These schools agreed to take part in the study within the schools, all students were invited to take part in this study , and from Ministry of Health / Director of Health , HawlerThalassemic Center in Erbil city

Results:

Table (1): Demographic Characteristic of Healthy School Children (Control Group) and Thalassemic Children (Case Group).

Variable		Control group N=200		Case group N=50	
		F	%	F	%
Age	**8-11 Years**	93	46.5	26	52.0
	12-15 Years	83	41.5	17	34.0
	16-19 Years	24	12.0	6	12.0
	≥20	0	0.00	1	2.0
Gender	**Male**	131	65.5	29	58.0
	Female	69	34.5	21	42.0
BMI	**< 18**	72	20.5	1	2.0
	18 - 24.9	126	20.5	25	50.0
	25 - 30	18	9.0	11	22.0
	> 30	15	7.5	13	26.0

F=Frequency %= percentage BMI= Body mass index

This table found that the range of age in the sample was between 8-11 years old ,which present in healthy school children (control group) (46.5%), while in Thalassemic children(**Case** group) was (52.0%),the highest percentage of gender in both groups were male (65.5% , 58.0%) respectively and the majority of body mass index in both group were range 18 - 24.9 and present(63.0% 50.0%) respectively.

Table 2 : Physical Growth Pattern Of Thalassemic Children And Adolescent (Case Group) Relation With Their Age And Gender .

Age / Physical Growth pattern	8-11 Years		12-15 Years		16-19 Years		≥20 Years	
	M. S.	S. D.	M. S.	S.D.	M. S.	S D.	M. S.	S D.
Standing height	119.4	7.87	129.18	7.97	135.83	12.34	169.00	0.00
Sitting height	57	8	61	4	67	7	69	0.00
Weight	25.12	7.38	29.88	6.49	33.17	7.03	61.00	0.00
BMI	25.12	7.38	29.88	6.49	33.17	7.03	61.00	0.00

Gender / Physical Growth pattern	Male		Female	
	M. S.	S.D	M. S.	S D.
Standing height	127.24	13.39	123.52	9.68
Sitting height	59	9	61	5
Weight	30.24	10.09	25.90	5.99
BMI	30.24	10.09	25.90	5.99

BMI= Body mass index S.D.= Stander deviation . M. S.= Mean score

This table shows that in (Thalassemic children) was normal in height (sitting and standing) and abnormal weigh in age group (8-11) but abnormal in age (12-15) years old that means they have high mean score in this age group, while in age group (16-19 and ≥20) years old they have growth retardation with highly significant mean score when compared with growth chart. Regarding BMI they have underweight in age groups (8-11and 12-15) years old but they have normal BMI in age groups (16-19 and ≥20) years old .

Regarding the age of Thalassemic children shows that males patients reported a normal in height(sitting and standing) but in females reported less than normal percentile , and they have normal weight in both gender, But they reported normal BMI in male patients higher than female .

Table 3: Physical Growth Pattern Of healthy Children And Adolescents (Control Group) Relation With Their Age And Gender .

Age / Physical Growth pattern	age					
	8-11 Years		12-15 Years		16-19 Years	
	M. S.	S. D.	M. S.	S. D.	M. S.	S. D.
Standing height	138	14	160	17	174	7
Sitting height	57.47	17.94	81.36	10.84	89.92	4.75
Weight	34.23	10.87	54.72	15.18	69.67	16.10
BMI	17.75	3.56	21.61	5.27	22.93	4.53
Gender / Physical Growth pattern	Gender			
	Male		Female	
	M. S.	S. D.	M. S.	S. D.
Standing height	158	20	138	11
Sitting height	79.21	16.32	56.23	15.23
Weight	53.16	18.98	35.26	10.04
BMI	20.96	5.25	18.09	3.52

BMI= Body mass index S.D.= Stander deviation .M. S.= Mean score

This table shows that the height(sitting and standing) and weight in healthy children and adolescents in control group were normal in all age groups respectively , also they have normal BMI in all age groups . Regarding the height(sitting and standing) fond that the males have higher than female while the weight in male they have more than in female,

Variable / Physical Growth pattern	Age											
	8-11 Years				12-15 Years				16-19 Years			
	Case		Control		Case		Control		Case		Control	
	Mean score	SD	Mean score	SD	Mean score	SD	Mean score	SD	Mean score	SD	Mean score	SD
Standing height	119.4	7.87	138	14	129.2	7.97	160	17	135.83	12.34	174	7
Sitting height	57	8	57.47	17.94	61	4	81.36	10.84	67	7	89.92	4.75
Weight	25.12	7.38	34.23	10.87	29.88	6.49	54.72	15.18	33.17	7.03	69.67	16.10
BMI	16.96	7.38	17.75	3.56	18	6.49	21.61	5.27	18.5	7.03	22.93	4.53
Variable / Physical Growth pattern	Gender							
	Male				Female			
	Case		Control		Case		Control	
	Mean score	SD	Mean score	SD	Mean score	SD	Mean score	SD
Standing height	127.24	13.39	158	205	123.52	9.68	138	11
Sitting height	59	9	79.21	16.32	61	5	56.23	15.23
Weight	30.24	10.09	53.16	18.98	25.90	5.99	35.26	10.04
BMI	18.78	10.09	20.96	5.25	16.98	5.99	18.09	3.52

regarding the BMI they have normal BMI in both gender within normal

Table 4: Comparative Physical Growth Pattern Between Thalathemic Children And Adolescents (case Group) And healthy Children And Adolescents (Control Group)

BMI= Body mass index S.D.= Stander deviation . S.= Mean score

Table(4) shows that Thalassemic children regarding the age they have high mean score than control group (normal child) in (sitting and standing) height , weight and BMI in all age groups . Regarding the gender the result revealed that the males and females (Thalassemic children) have lower mean score than male and females in control group (Non Thalassemic children) in, height(sitting and standing) and eight but females in (Thalassemic children) have high mean score than male in control group (Non Thalassemic children).while BMI shows high mean score in both gender (Thalassemic children) than in control group (Non Thalassemic children).

Discussion :

All age groups were compare with respect to age and gender with (Thalassemic children) control group and(non Thalassemic children) case group.

The present study revealed that the majority age of the Thalassemic children (case group,)and healthy children and adolesents (control group) range between 8-11 years old , the highest percentage of gender in both groups were males and the majority of BMI in both group were range 18 - 24.9 as show in**(Table 1)**

Results of this study show growth retardation in age groups (15 -19) years old of the sample of Thalassemic children and adolescents with highly significant mean score when compared with growth chart in age groups (15 -19) years old . Regarding BMI they have underweight in age groups (8-11and 12-15) years old but they have normal BMI in age groups (16-19 and ≥20) years old when compared with growth chart. **(Table 2).**There are many factors are involved in the growth retardation of patients with Thalassemic, Such as chronic anemia, iron overload, and bone dysplasia receiving regular blood transfusions and subcutaneous desferrioxamine therapy [(9)] The observation of this study was not supported by a study who mentioned that the retardation can occur as early as the first or second year of life in major thalassemia but these abnormalities are more apparent after 6 to 8 years [(10).]The pattern of growth abnormalities in Thalassemic children, in which wasting is prominent early in life followed by stunting in the later years of childhood [(11).]In **(Table 3)** shows that the height(**sitting and standing)** weight and BMI in (Non Thalassemic children) control group were normal in all age groups when compared with growth chart. Regarding the height(sitting and standing) they have more than 50th percentile in males, but in female they have normal percentile while the weight in male they have more than 50th percentile but in female they normal percentile (50th percentile), regarding the BMI they have normal BMI in both gender within 50th normal percentile[(6).] Mean score of height , weight and BMI of Thalassemic children were compared with non Thalassemic children for age and sex(, Thalassemic children regarding the age they have high mean score than control group (normal child) in (sitting and

standing) height , weight and BMI in all age groups . Regarding the gender the result revealed that the males and females (Thalassemic children) have lower mean score than male and females in control group (Non Thalassemic children) in height(sitting and standing) and weight but females in (Thalassemic children) have high mean score than male in control group (Non Thalassemic children).while BMI shows high mean score in both gender (Thalassemic children) than in control group (Non Thalassemic children) as present in **(Table 4).** The observation of this study was supported by a study who observed the growth retardation in all patient age between 12 to 20 years old (3).This finding of the present study was supported by study who found that a late start in chelation therapy has a negative, yet minor effect, on growth and bone maturation [(11).]

Conclusion : The study conclude that (Thalassemic children) regarding the age they have high mean score than control group (normal child) in (sitting and standing) height , weight and BMI in all age groups.

Recommendation: the study recommended that Thalassemia was a important health problem in pediatric population and plans need to set up to reduce the number of cases born by development , population screening programme and awareness creating.

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