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Impact of Dietary Protein Supplementation on Muscle Mass in Children with Cancer

Sara M Makkeyah[1], Heba E El-Khouly[1], Ehab K Emam[1], Mohamed Mosaad [1], Kari A Abd El-Aziz[2], Basma A Mohamed[1]

[1]Department of Pediatrics, Faculty of Medicine, Ain Shams University, Cairo, Egypt

[2]Department of Radiodiagnosis, Faculty of Medicine, Ain Shams University, Cairo, Egypt

INTRODUCTION

Malnutrition is a well-recognized complication in children with cancer.

Sarcopenia may coexist in the context of malnutrition amplifying its negative impact on the patients' outcome.

AIM

To assess the muscle mass status of children with cancer.

To evaluate the impact of dietary protein supplementation on muscle mass of children with cancer.

METHOD

Using muscle ultrasound, we compared muscle mass [quadriceps muscle layer thickness (QT) and Rectus femoris cross-sectional area (RF-CSA)] in 47 pediatric patients with cancer to 27 age and sex-matched healthy controls.

In a follow-up phase, we examined the effect of protein supplementation (target 1.5 g/k/d for 3 months) on muscle mass parameters in the patient's group.

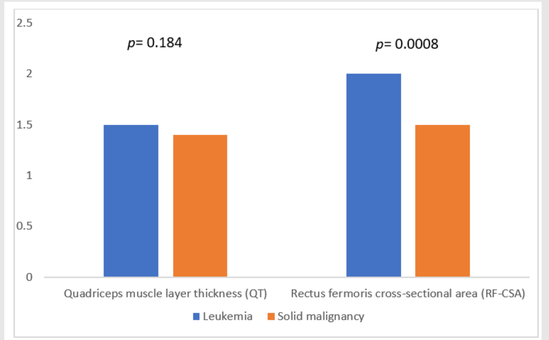
RESULTS

A total of forty-seven pediatric patients; 31 with acute lymphoblastic leukemia (ALL) and 16 with solid malignancy were enrolled.

The mean age at diagnosis was 6.7 years, and the male-to-female ratio was 2.4:1.

Most of the patients (78.7%) had low/very low socioeconomic score.

At baseline, children with cancer had lower muscle mass when compared to healthy controls (mean ± SD QT 1.5 ± 0.3 cm versus 2.3 ± 0.7 cm, p<0.0001; mean ± SD RF-CSA 1.8 ± 0.5 cm^2 versus 2.8 ± 0.9 cm^2, p<0.0001).



children with ALL and those with solid tumors had comparable results regarding mean ± SD QT (1.5 ± 0.3 cm for ALL versus 1.4 ± 0.3 cm for solid group, p=0.184), however, mean RF-CSA was significantly lower among children with solid tumors (1.5 ± 0.4 cm^2 versus 2.0 ± 0.5 cm^2, p=0.0008)

	Baseline n= 47	3-months follow-up n = 44	P value
BMI-SDS	-0.2 ± 1.4	0.1 ± 1.1	P=0.157
QT (cm)	1.5±0.3	1.9 ± 0.3	p<0.0001
RF-CSA (cm2)	1.8 ± 0.5	2.5 ± 0.7	p<0.0001

At 3 months evaluation, there was a significant increase in both mean QT (1.5±0.3 cm at baseline versus 1.9 ± 0.3 cm at 3 months, p<0.0001) and mean RF-CSA (1.8 ± 0.5 cm^2 at baseline versus 2.5 ± 0.7 cm^2 at 3 months, p<0.0001). On the other hand, BMI SDS did not show any significant changes at 3-months follow-up (-0.2 ± 1.4 at baseline versus 0.0 ± 1.1 at 3-months, p<0.0001).

CONCLUSIONS

Children with cancer exhibit lower muscle mass than healthy controls.

Dietary intervention with high-protein intake can ameliorate the state of sarcopenia and improve the overall patient's outcome.

REFERENCES

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CONTACT INFORMATION

Sara Makkeyah.
Associate professor of Pediatrics and Pediatric Hematology/ Oncology & Bone Marrow Transplant.
Department of Pediatrics, Ain Shams University, Cairo, Egypt. Email: smakkeyah@med.asu.edu.e.g.
Tel: +201140105222