

## Evaluation of Bone Mineral Density in Children with Acute Lymphoblastic Leukemia (ALL) and Non-Hodgkin's Lymphoma (NHL)

Ghasemi A<sup>1</sup>, Banihashem A<sup>2</sup>, Ghaemi N<sup>3</sup>, \*Elmi S<sup>4</sup>, Esmaeili H<sup>5</sup>, Erfani Sayyar R<sup>6</sup>, Elmi S<sup>7</sup>

<sup>1</sup>Assistant Professor of Pediatric Hematology and Oncology, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>2</sup>Associate Professor of pediatric Hematology and Oncology, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>3</sup>Associate Professor of Pediatric Endocrine and Metabolism, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>4</sup>Pediatrician, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>5</sup>Associate Professor, Department of Biostatistics and Epidemiology and Health Sciences Center, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>6</sup>Anesthesiologist, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

<sup>7</sup>General physician, Mashhad University of Medical Sciences, Mashhad, Iran.

### Introduction:

Acute lymphoblastic leukemia (ALL) and Non-Hodgkin's Lymphoma (NHL) are the most common childhood and adolescence malignancy respectively. Due to the increasing survival of these children, today late side effects of treatments are important. Therapies such as corticosteroids, cytotoxic and radiotherapy effect on bone density and put the child at risk of osteoporosis and pathological fractures.

### Material and Methods:

This 3-year cross sectional study was performed in Dr. Sheikh Children's Hospital in Mashhad on 50 children with ALL (n=25) and NHL (n=25). Half of them were received (n= 25) chemotherapy alone and half of them chemotherapy plus radiotherapy (n=25). All children were in the remission phase. We assessed them by DEXA bone mineral densitometry (BMD) on the lumbar spine and femoral neck (hip). We also measured some bone biomarkers include calcium (ca), phosphorus (p), parathormone (PTH), alkaline phosphatase (ALP) in plasma. Results by age, height, sex and Body Mass Index (BMI) were adjusted with a special software.

### Results:

Mean age was  $8.28 \pm 3.93$  years. There was no significant difference on bone biomarkers (Ca, P, ALP, PTH) between ALL, NHL and also between the two treatment groups. Children with ALL had lower density at the hip and lumbar spine. (Respectively p value  $< 0.001$  and p value =0.018). A total of 50 patients, the hip BMD showed normal results in 3 patients (6%), in 14 patients (28%) osteopenia were seen and 33 patients (66%) had osteoporosis. In whom received radiotherapy plus chemotherapy, one patient had normal BMD and 24 patients (48% of total patients) at the hip and 22 patients (44%) at lumbar spine had decreased BMD. In contrast, in whom had only chemotherapy, 24 patients (48%) had osteoporosis at hip and 23 (46%) at the lumbar spine. There was no significant difference in BMD between the sexes.

### Conclusion:

Given that 94% of children had abnormal bone density, Seem to pay more attention to the metabolic status and BMD in children with cancer can develop appropriate strategies to improve health and quality of their life.

**Keywords:** Acute Lymphoblastic Leukemia (ALL), Bone Mineral Density, chemotherapy, Non-Hodgkin's Lymphoma (NHL), Radiotherapy.

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### \*Corresponding Author:

Saghi Elmi, MD, Mashhad University of Medical Sciences, Mashhad, Iran.

Email: saghi\_elmi\_106@yahoo.com