Journal homepage: www.ijcbr.com

INTERNATIONAL JOURNAL OF CLINICAL AND BIOMEDICAL RESEARCH

Original Article

DIFFERENTIAL DIAGNOSIS OF DIFFUSE BONE MARROW UPTAKE ON ^{18}F-FDG PET/ CT

HABUSARI HAPKIDO[1], BASUKI HIDAYAT[1,2], A. HUSSEIN S. KARTAMIHARDJA[1], TRIAS NUGRAHADI [1]

AUTHOR DETAILS

[1]Department of Nuclear Medicine and Molecular Imaging, School of Medicine , Universitas Padjadjaran / Dr. Hasan Sadikin General Hospital, Bandung, West Java, Indonesia.

[2]PET and Nuclear Medicine center, Mochtar Riady Comprehensive Cancer Center Siloam Hospital, Semanggi, Jakarta, Indonesia.

ARTICLE INFO

Received: 17th Dec 2015,
Accepted: 22nd Jan 2016.

**Corresponding author email:*
habusari_hapkido@yahoo.co.id.

ABSTRACT

Background: Bone marrow is a frequent site of metastatic tumors, especially from breast, lung, and prostate cancers. Metastatic tumor in the bone marrow may influence the response to treatment, overall survival, and resulting decreased hematopoiesis. Diffusely and homogenously bone marrow uptake in ^{18}F-FDG PET/CT scan is frequently observed which can caused by many conditions. **Material and methods:** We retrospectively analyzed the consecutive records of F-18 FDG PET scans performed from April 2011 to August 2013 at Mochtar Riady Comprehensive Cancer Center Siloam Hospital, A total of 2952 result were reviewed. 16 patients with diffusely and homogenously bone marrow uptake in F-18 FDG PET/CT whole body scan between January 2012 and December 2013 were evaluated to find out the etiology. **Results:** From 2952 patients performed ^{18}F-FDG-PET/CT there are 16 patients (5 men, 11 women) with diffusely and homogenously increased FDG uptake in bone marrow, mean age: 52 years, range 5–82 years. It was found that 6 of 16 FDG PET/ CT positive patient with solid tumors and 10 of 16 FDG PET/CT with nonsolid tumors. Malignancy was observed in 14 patients and benign in 2 patients. Diffusely and homogenously uptake due to 1 patiets with Idiopathic thrombocytopenic purpura (ITP) , 6 patient with anaemia, 7 patients with chemotherapy, 1 patients with Granulocyte Colony-Stimulating Factor (G-CSF) and 1 patients with extra-nodal non-hodgkin lymphoma were observed. **Conclusion:** Diffusely and homogenously increase bone marrow on ^{18}F FDG PET/ CT whole body scan uptake can be seen in malignant or benign disease and history of treatment. Spleen uptake are observed at the initial imaging than bone marrow involvement while spleen uptake more frequently reflects disease involvement.

KEYWORDS

FDG PET. Bone marrow involvement, solid tumor, nonsolid tumor.

INTRODUCTION

The International Agency for Research on Cancer (IARC), the specialized cancer agency of the World Health Organization, released the latest data on cancer incidence, mortality, and prevalence worldwide including Indonesia. According to GLOBOCAN 2012, an estimated 14.1 million new cancer cases and 8.2 million cancer-related deaths occurred in 2012. The most commonly diagnosed cancers worldwide were those of the lung (1.8 million, 13.0% of the total), breast (1.7 million, 11.9%), and colorectum (1.4 million, 9.7%). The most common causes of cancer death were cancers of the lung (1.6 million, 19.4% of the total), liver (0.8 million, 9.1%), and stomach (0.7 million, 8.8%). [1]

Bone marrow (BM) is one of the most common sites to be involved by tumors that metastasize via the bloodstream.[2] Bone marrow is a frequent site of metastatic tumors, especially from breast, lung, and prostate cancers. Approximately 90% of metastases have been observed in concordance with the distribution of hematopoietic marrow.[3] Detection of metastatic tumors to the bone marrow is of great importance for the clinical staging of tumor spread because malignant infiltration of hematopoietic tissue can alter the clinical course of the disease. Metastatic tumor in the bone marrow may influence the response to treatment, overall survival, and resulting decreased hematopoiesis. The bone marrow provides erythrocytes, leukocytes, and platelets to the body, and usually accumulates small amount of F-18 fluoro-2-deoxyglucose (F-18 FDG) on positron emission tomography (PET) images. Bone marrow hypermetabolism might reflect characteristics of the neoplasm, although cytokines are produced not only by neoplasm but also as part of the inflammatory response.[2,5] Though bone marrow involvement is most commonly seen with myeloid or lymphoid hematological malignancies, solid tumors may also spread to the bone maroow via the hematogenous route.[2]

Many imaging modalities have been developed to detect and assess bone marrow metastases.[2] Positron-emission