Basrah Journal of Surgery

Case Report

Bas J Surg, September, 8, 2002

BONE MARROW NECROSIS IN NON-HODGKIN'S LYMPHOMA

Zuhair A. Al-Barazanchi[*], Jinan G. Hasan [@], Ali Abdul Zahra[#]

[*]M.Sc. (Haematology), Specialist Haematologist, Basrah Military Hospital. [@]Arab Board Certified Paediatrician, Assistant Professor, Department of Paediatrics, University of Basrah College of Medicine and Specialist Paediatrician, Basrah Maternity and Child Hospital. [#]M.B.Ch.B., Senior House Officer, Basrah Military Hospital, Basrah, IRAQ.

Summary

We describe a newly diagnosed case of non-Hodgkin's lymphoma with clinical and haematological features of bone marrow necrosis in a three-year old female who sustained a rapidly progressive and terminal course.

Introduction

Bone marrow necrosis (BMN) is a rare entity, most frequently associated with post-mortem changes[1], appearing in up to 19.8% of all autopsies[2]. However, ante mortem diagnosis is quite difficult and uncommon. It is defined morphologically by the destruction of haemopoetic tissue including the stroma with the preservation of the bone[3].

Clinically, it usually presents as severe bone pains, fever and weight loss[4]. It is seen in association with haematological malignancies, like acute and chronic leukaemias, malignant lymphomas and multiple myeloma[1], in metastatic neoplasia and bacterial infections especially when hypovolemia and septic shock are present. It can also be encountered with disseminated intravascular coagulation, following irradiation and anti-neopalstic therapy[3]. Rare cases had been reported in association with antiphospholipid syndrome [3,5,6,7], parvoviurs B 19 infection preceeding the development of haematological malignancies[8], typhoid fever[9] and anorexia nervosa[10]. Other than haematological malignancies, BMN can also be seen in association with sickle cell disease due to repeated marrow infarction following sickle cell crisis with the development of avascular necrosis of the bones[1,3,11]. It is usually accompanied by hypercalcaemia and elevation of lactate dehydrogenase enzyme[2]. Peripheral blood usually shows anaemia, leuko-erythroblastosis and schistocytosis[4]. Bone marrow shows amorphous material with isolated cells in

Correspondence to:
Dr. Zuhair A. Al-Barazanchi
Chief of Laboratory Department, Basrah Military Hospital, Basrah; IRAQ

different stages of necrobiosis[2] and variable degree of pancytopenia[12].

Case Description

A three-years old female patient from Basrah, Al-Midaina, was brought to Basrah Military Hospital complaining from night fever and sweating for four weeks with frequent coughs and purulent sputum, poor appitite and weight loss. On examination, the patient was pale, feverish, with thin body built, and palpable, rubbery, non-tender sub-mandibular lymph nodes. The liver was just palpable. Chest examination showed few ronchi. All other systems were normal.

Chest X-ray was normal, abdominal ultrasound study confirmed the presence of hepatosplenomegaly with the absence of para-aortic lymph node enlargement.

Peripheral blood examination showed the following results: Hb 7.4g/dl, HTC (PCV) 26%, ESR 20mm/1st hr, WBC 9900/cmm and platelets 187000/cmm. The differential count showed neutrophils 27%, lymphocytes 69%, monocytes 3% and eosinophils 1%. Blood film showed normochronic normocytic red celss, relative lymphocytosis with the absence of any blast. No malarial parasite was seen. Bone marrow study, thus, had been decided. Aspiration was tried from the right posterior iliac crest, under GA and a little amount of viscid material appeared with no marrow fragments. Smears stained with leishmann's stain showed amorphous necrotic material with peripheral blood cells and no apparent marrow material. Five days later, the peripheral blood picture was repeated and it showed Hb 6.2g/dl, PCV 20%, ESR 65 mm/1st hr, WBC 4900/cmm and platelets 42000/cmm The differential count showed neutrophils 20%, lymphocytes 72%, monocytes 5%, eosinophils 2% and basophils 1%. Blood film showed normochronic normocytic red cells, atypical lymphocytes (18%), with the absence of malarial parasite and no definite blast was seen.

Biomechanical investigations showed blood urea 17mg/dl, serum creatinie 0.7mg/dl, serum uric acid 4.5mg/dl, serum calcium 6.8mg/dl, serum potassium 4.4mg/dl & serum phosphorus 4.8mg/dl. Sickling test was negative and haemoglobin electrophorosis was of A pattern.

Bone marrow study again, had been tried from both right and left posterior iliac crests under GA. Few drops of marrow was delivered and trephine biopsy was taken. Aspirate and touch imprint showed an increase in lymphocytic infiltration (around 30%of total nucleated marrow cellular elements) with, surprisingly large number of clusters of necrotic cells with unidentified type and morphology, nuclear pyknosis and intensely basophilic homogeneous cytoplasm infiltrating the marrow and appearing in groups with scattered normal cellular marrow elements in between. There were no Leishmann-Donovan bodies seen.

Bone marrow trephine biopsy paraffin-sections stained with eosin-haematoxylin showed increased marrow cellularity with almost total loss of normal marrow architecture and replacement by diffuse small and large, cleaved and non-cleaved abnormal lymphoid cells. Few scattered magakaryocyts were left and multiple focal areas of necrotic cells of unidentified type seen. On that basis, the case had been diagnosed as non-Hodgkin's lymphoma, diffuse, mixed small and large cell type with clinical and histomorphological features of bone marrow necrosis.

The patient was referred to the Oncology Unit in Al-Basrah Maternity and Paediatric Hospital for treatment. She received two courses of NHL therapy, including methotrexate, vincristine and doxorubicin along with supportive therapy, including platelet

transfusion, hydration and systemic antibiotics. The patient runned a terminal course and she died soon after the second course.

Discussion and Conclusion

Bone marrow necrosis is an uncommon ante-mortem finding among haematological malignancies. To our knowledge, this is the first to report it in Iraq preceding non-Hodgkin's lymphoma. However, Al-Sani, AK and Shakir AN in 1983 did report a case of BMN preceding the development of acute myelomonocytic leukaemia[13].

Ante mortem diagnosis of BMN is technically difficult, thus a high index of suspecion is required. However, repeated MRI imaging of bones along with bone marrow trephine biopsy in suspected cases can greately help in reaching the diagnosis[2,14,15,16,17].

It seems that bone marrow necrosis is an index of terminal course in haematological malignancies and it carries an extremely poor prognosis with a mortality rate of about 22%. However, in our case, the process of BMN was focal, yet it carried a poor prognostic index which was in concordance with most published literarues[1,2,18-21].

References

1Ranaghan L, Morris, TC, Desai, ZR, Markey GM. Bone marrow necrosis. Am J Hematol 1994; 47(3): 225-8.

2.Delgado P, Rica M, Alverez R. Magnetic resonance imaging in the early diagnosis of bone marrow necrosis. Sangre Barc 1999; 44(1): 65-9.

3.Bulvik S, Arnson I, Ress S, Jacobs P. Extensive bone marrow necrosis assoicated with antiphospholipids antibodies. Am J Med 1995; 98(6): 572-4.

4.Dunn P, Shih LY, Liaw SJ, Sun CF. Bone marrow necrosis in 38 adult cancer patients. J Formos Med Assoc 1993; 92(12): 81107-10.

5.Paydas S, Kocak R, Zorludemir S, Baslamisili F. Bone marrow necrosis in antiphospholipid syndrome. J Clin Pathol 1997; 50(3): 261-2.

6.Moore J, Ma DD, Concannon A. Non-malignant bone marrow necrosis: A report of two cases. Pathology 1998; 30(3): 318-20.

7.Schaar CG, Ronday KH, Boets EP, Van-der-Lubbe PA, Breedveld FC. Catastrophic manifestation of anti-phospholipid syndrome. J Rhumatol 1999; 26(10): 2261-4.

8.Petrella T, Bailly F, Mugneret F, Giallot D, Chavanet P, Guy H, et al. Bone marrow necrosis and human parvovirus associated infection preceding Ph1 + acute lymphoblastic leukemia. Leuk-lymphoma 1992; 8(4-5): 415-9.

9.Gupta RK. Extensive fatal bone marrow necrosis in typhoid fever. Indian J Pathol Microbiol 1992; 35(1): 66-8.

10.Wypolz B, Blanche P, Herry I, Guesnue M, Picard F, et al. Fatal bone marrow necrosis in anorexia nervosa (letter). Presse Med 1993; 9,22(3): 1419.

11.Sergeant GR. The clinical features of sickle cell disease. Baillieres Clin Haematol 1993; 6(1): 93-115.

12.Aboulafiia DM, Demirer T. Fatal bone marrow necrosis following fludarbine administration in a patient with indolent lymphoma. Leuk Lymphoma 1995; 19(1-2): 181-4.

13.AL-Sani AK, Shakir AN. Bone marrow necrosis preceding acute nyelomonocytic leukaemia. Iraqi Army Med J 1983; 1,5: 58-64.

14.Weissman DE, Negendank WG, Al-Katib AM, Smith MR. Bone marrow necrosis in lymphoma studied by magnetic resonance imaging. Am J Hematol 1992; 40(1): 42-6.

15.Takasaki S, Otsuka T, Gorndo H, Kamura K, Nomoto M, et al. Magnetic resonance imaging (MRI) of bone marrow necrosis. Rinsho Ketsueki 1994; 35(12): 1349-54.

16.Murphy PT, Sivakumaran M, Casey MC, Liddicoat A, Wood JK. Lymphoma associated bone marrow necrosis with raised anti-cardiolipin antibody. J Clin Pathol 1998; 51(5): 407-9.

17.Huang TY, Huang JT, Yam LT, Postel GC, Abaskaron M. Computed tomography guidance in bone marrow aspiration for diagnosis of bone marrow necrosis and metastasis. J Ky Med Assoc 1999; 97(7): 299-302.

18.Hamidou M, Rigal-Huguet F, Moreau A, Dacloux JM, Accard F, et al. Bone marrow necrosis in non-malignant hemopathies, 7 cases. Rev Med Interne 1993; 14(10): 958.

19.Shimokawa T, Yamamoto Y, Nakayama N, Yamada H, Takeyama H. Marked bone marrow necrosis preceding acute monoblastic leukemia. Gan To Kagaku Ryoho 1995; 22(14): 2111-4.

20.Chevalet P, Moreau A, Muller F, Berthelot JM, Hamidou M, et al. Extensive bone marrow necrosis and thrombotic microangiopathic anemia revealing disseminated adenocarcinoma. Presse Med 1998; 4-11, 27(24): 1213-5.

21.Forrest DL, Mack BJ, Nevill TJ, Couban SH, Zayed E, et al. Bone marrow necrosis in adults acute leukemia and non-Hodgkin's lymphoma. Leuk-lymphoma 2000; 38(5-6): 627-32.