suggest a 5 year survival rate of 16% in cases treated surgically. Perhaps because of its rarity, prognostic factors are difficult to discern; it appears not to depend on either clinical stage or histologic grade. Adrenocortical cancer shares with renal cell carcinoma the unusual propensity to propagate tumour thrombus along major veins, as demonstrated in the current case. One might imagine that this feature should adversely affect prognosis, and our patient’s 30 month recurrence-free interval is striking in this regard.

This case serves to point out that gynaecomastia may occasionally be due to hormonally active neoplasia. Other causes include trophoblastic tumours secreting human chorionic gonadotrophin (teratomas and some seminomas) and rare entities such as Leydig cell tumours and pelvic sarcomas. Perhaps all young men with gynaecomastia ought to have a steroid screen.

References

© The Fellowship of Postgraduate Medicine, 1993

Hypercalcaemia and multiple osteolytic lesions in childhood acute lymphoblastic leukaemia

P.N. Soni

Department of Medicine, University of Natal and King Edward VIII Hospital, PO Box 17039, Congella, 4013 Durban, Republic of South Africa

Summary: A 12 year old boy presenting with hypercalcaemia (calcium 3.25 mmol/l) and osteopaenia with multiple osteolytic lesions was found to have acute lymphoblastic leukaemia without lymphadenopathy or organomegaly. Hypercalcaemia is a rare feature of acute leukaemia, but the patients previously described all show very similar characteristics, which were highlighted in this patient. These include age (10–20 years), severe osteolytic bone lesions, lymphoblastic leukaemia, and normal white cell count with absent or rare circulating blasts. Parathyroid hormone levels were normal in this patient, and response to induction therapy was good. This case demonstrates that acute lymphoblastic leukaemia may present in an atypical form without peripheral blasts but with hypercalcaemia and gross skeletal changes.

Introduction

Hypercalcaemia and severe osteolytic lesions are rare complications of acute lymphoblastic leukae-
Radiographic bone changes occur in 21% of childhood cases of leukaemia at diagnosis. These include prominent transverse metaphyseal bands, intramedullary osteolytic mottling and periosteal reactions.

The presence of radiographic bone changes at diagnosis in patients with ALL does not appear to correlate with prognosis. The case history of a 12 year old boy presenting with hypercalcaemia and multiple osteolytic lesions due to ALL is reported.

Case report

A 12 year old boy was referred from a peripheral hospital with a problem of hypercalcaemia (3.25 mmol/l) and inability to walk. He complained of backache followed by a gradual onset of weakness of his lower limbs for 4 months progressing to inability to walk during the past month. The patient admitted to polydipsia, polyuria and vague abdominal pain.

On examination he was mildly dehydrated; there was no lymphadenopathy, hepatomegaly or splenomegaly. Neurological examination revealed proximal muscle weakness only. His blood count showed a haemoglobin concentration of 10.4 g/dl, a white cell count of 9.4 \times 10^9/l with a normal differential white cell count and absence of blasts in the peripheral smear, and platelets of 335 \times 10^9/l. Electrolyte measurement showed a sodium of 143 mmol/l, potassium 3.57 mmol/l, urea 8.4 mmol/l and creatinine 69 \mu mol/l. Hypercalcaemia was confirmed (3.25 mmol/l) and the phosphate was normal (1.32 mmol/l); serum albumin was 35 g/l. The parathyroid hormone level (mid-molecule) was 69 pmol/l (normal 29–85 pmol/l).

Radiographic examination showed marked osteopaenia of the thoracic and lumbar vertebrae together with collapse of the upper thoracolumbar vertebral bodies (Figure 1). Osteolytic lesions were visible in both humeri (Figure 2), the skull and the necks of both femurs. No mediastinal masses were seen on the chest X-ray. Abdominal ultrasonography was normal.

The patient was treated initially with a saline infusion and frusemide, resulting in a lowering of the serum calcium to normal values and an improvement of the symptoms. Bone marrow examination showed an infiltrate of blasts of lymphoblastic origin. Cell marker studies were unhelpful. The patient was treated with prednisolone, vincristine, cytosine arabinoside and doxorubicin. He became ambulant subsequent to this induction chemotherapy. A remission was achieved after which he received cranial irradiation and intrathecal methotrexate. The patient remained well and was transferred to his hospital of origin. At no time during the patient's illness were blast...
cells seen in the peripheral smear. Bone lesions did not regress after chemotherapy, although the serum calcium level remained normal.

Discussion

This patient showed several unusual features for ALL. These include the presentation with hypercalcemia, the normal white cell count, the absence of blasts in the peripheral smear, the absence of lymphadenopathy or organomegaly, and the presence of osteolytic lesions. Although fewer than 20 cases of ALL and hypercalcemia have been reported, many show strikingly similar features to those described in this patient, namely, age 10–20 years, severe osteolytic lesions, and normal white cell count with rare or absent circulating blasts.

Myers, in 1956, included one case of acute leukemia in a review of 61 patients with hypercalcemia. This was the first record of the association of hypercalcemia with leukemia. In a series of 123 cases of leukemia in which serum calcium and phosphorus were measured, 2.5% were found to have hypercalcemia. Elevated calcium levels have also been reported in other malignancies in the absence of radiological or autopsy evidence of bone destruction.

Kalayjian et al. found that 96% of patients with leukemia and radiological evidence of bone involvement were of the lymphoid type; furthermore, in over 50% the disease was of the leukemic variety. Griffiths has emphasized the association of bone changes with the 'aleukaemic' forms of acute leukemia in children, resembling this case.

Cell markers were not helpful in our patient; however, a recent report has shown two cases with T-ALL, hypercalcemia and osteolytic lesions. Another case was CALLA (common-ALL antigen)-positive.

Some investigators suggest that there is no significant relationship between initial bone involvement and clinical outcome in childhood ALL. Others have reported a much shorter duration of remission in patients with ALL and bone lesions on radiographs. None of these studies has prospectively assessed whether growth is affected by the bone lesions, or whether radiological healing of lesions occurred with chemotherapy.

In most cases no mechanisms for the hypercalcemia have been found, although one previous case has demonstrated a raised concentration of vitamin D3 and one reported autonomous production of parathyroid hormone by lymphoblastic leukemia cells in culture. This patient had a normal level of parathyroid hormone, although one would expect this to be suppressed. Production of an osteoclast activating factor or factors would seem the most likely explanation for most cases of hypercalcemia in lymphoblastic lymphoma.

This case illustrates that lymphoblastic leukemia must be considered in the differential diagnosis in a young patient presenting with hypercalcemia, even when there are no peripheral blast cells.

Acknowledgements

I would like to thank Dr V. Gathiram for constructive comments on the manuscript.

References

Hypercalcaemia and multiple osteolytic lesions in childhood acute lymphoblastic leukaemia.

P. N. Soni

doi: 10.1136/pgmj.69.812.483

Updated information and services can be found at:
http://pmj.bmj.com/content/69/812/483

These include:

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/