Chronic lymphocytic leukemia (CLL) and osteoporosis are diseases of older adults with high prevalence rates. CLL infiltrates the bone marrow, increasing bone resorption and demineralization which contribute to the pathophysiology of osteoporosis. Despite this, there are limited clinical data describing the association of CLL with osteoporosis and fracture risk. We hypothesized that osteoporosis and fragility fractures (FF) are common in patients with CLL. The Huntsman Cancer Institute (HCI) has a CLL database which includes all patients diagnosed with CLL since January 1, 2000 and received care at the HCI. Patients included were identified from the CLL database with ICD-9 and 10 codes associated with osteopenia, osteoporosis and/or presence of a FF. Of the 57 patients included, 67% were female (n=38) with a mean age of 69 ± 10 years and 93% Caucasian. 60% (n=34) had RAI stage of 0-1 with genetic changes noted as follows: Del(13q) 46% (n=26), Del(17p) 7% (n=4), Del(11q) 5% (n=3), and Trisomy 12 14% (n=8). IGVH mutation was present in 31.6% of patients (n=18). 47% (n=25) of patients were treated with chemotherapy, of which Rituximab (n=14), Bendamustine (n=7), Cyclophosphamide (n=5), and Ibrutinib (n=5) were the most frequently used. 58.5% (n=32) had a history of FF, with 84% occurring in the spine (n=27/32). Assessment for Vitamin D deficiency and hyperparathyroidism were performed in 54% (n=31) and 21% (n=12) of the cohort respectively. Even though every patient in the study either had a diagnosis of osteoporosis by ICD code or FF, only 44% (n=25) of patients had an available DXA scan for our review, and only 31% (n=18) received...
treatment for osteoporosis. Of those with a DXA, the worst T score was in the right femoral neck (T score -1.9, IQR -1.5 to -2.5) with 44% (n=14/32) either having T scores in the normal or osteopenic range. Interestingly, FF was associated with higher T scores in the spine (FF spine T score -1.0±1.5 vs no FF T score -2.2±0.8, p=0.03). Clinical factors associated with FF were male sex (83% men vs 46% women, p<0.01) and positive smoking history (93% smokers vs 46% non-smokers, p<0.01). Use of chemotherapy and hip T scores were not associated with FF. The data from our study suggests that patients with CLL are predisposed to axial fragility fractures despite non-osteoporotic T scores. In addition, osteoporosis screening with DXA is under-utilized in the CLL population, despite meeting age-appropriate screening guidelines. Increased awareness and screening for axial fragility fractures, especially in men and smokers, should be recommended in the long term follow up of patients with CLL. Further study is needed to understand the pathophysiology of osteoporosis and FF in patients with CLL to develop improved methods for prevention of these morbid fractures.

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