

Treatment of Osteoporosis with Zoledronic acid in children with Duchenne Muscular Dystrophy

Irene Fernandez Viseras , Ele Konstantoulaki, Heinz Jungbluth, Elizabeth Wraige, Vasantha Gowda, Anthony Hulse, Moira Cheung

Paediatric Endocrinology and Neurology Department,

The Evelina London Children's Hospital, Guys and St Thomas' Foundation Trust, London, UK

Background:

Duchenne muscular dystrophy, caused by mutations in the dystrophin gene, is a X linked disorder that leads to progressive wasting of skeletal and cardiac muscle.

Diagnosis is commonly between 2-5 years. Ambulation is usually compromised in the teenage years before respiratory and cardiac complications result in premature death in their early 30's.

High dose corticosteroids have been demonstrated to improve muscle strength, maintain respiratory function and prolong ambulation.

Osteoporosis with associated vertebral and long bone fractures can be a devastating complication of Duchenne muscular dystrophy. Fractures can cause pain, deformity, loss of mobility and impact survival.

Treatment with intravenous bisphosphonates such as pamidronate is currently the first treatment choice for paediatric osteoporosis of different etiologies

Objective:

The aims of our study were:

- 1) To identify the proportion of boys with DMD with osteoporosis in our service
- 2) To evaluate the side-effect profile of those treated with zoledronic acid.

Zoledronic acid was selected in our DMD cohort in preference to pamidronate due to the shorter administration and thus reduced time spent in hospital.

Method:

All boys 16 years and under with a diagnosis of DMD seen in a tertiary referral centre were included in this cohort. Patient characteristics were collected both from hospital records and via direct patient contacts. Patients treated with bisphosphonates were interviewed following their first infusion of zoledronic acid to establish the tolerability and side-effect profile of treatment.

Results:

Of 61 patients (mean age 10.0 years, range 1 to 16 years) with DMD, 62% had been treated with corticosteroids (Figure 1).

11% had a diagnosis of osteoporosis and were commenced on zoledronic acid (Figure 2).

Patients treated with zoledronic acid were older compared to non-treated patients (Mean \pm SD, 13.6 \pm 5.4 vs 10.1 \pm 4.3 P<0.05) and more likely to be treated with steroids (100% vs 42% p<0.01).

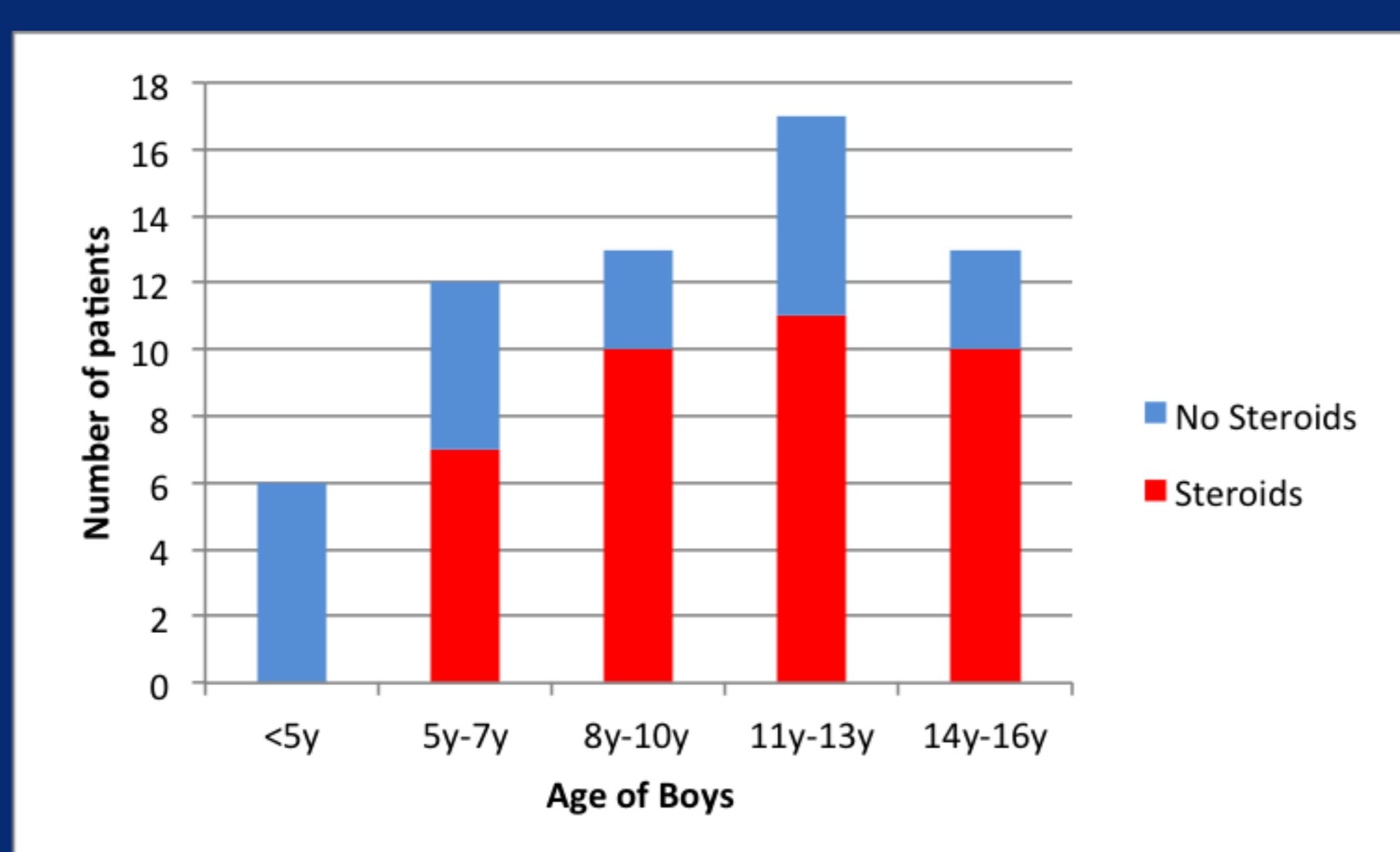


Figure 1

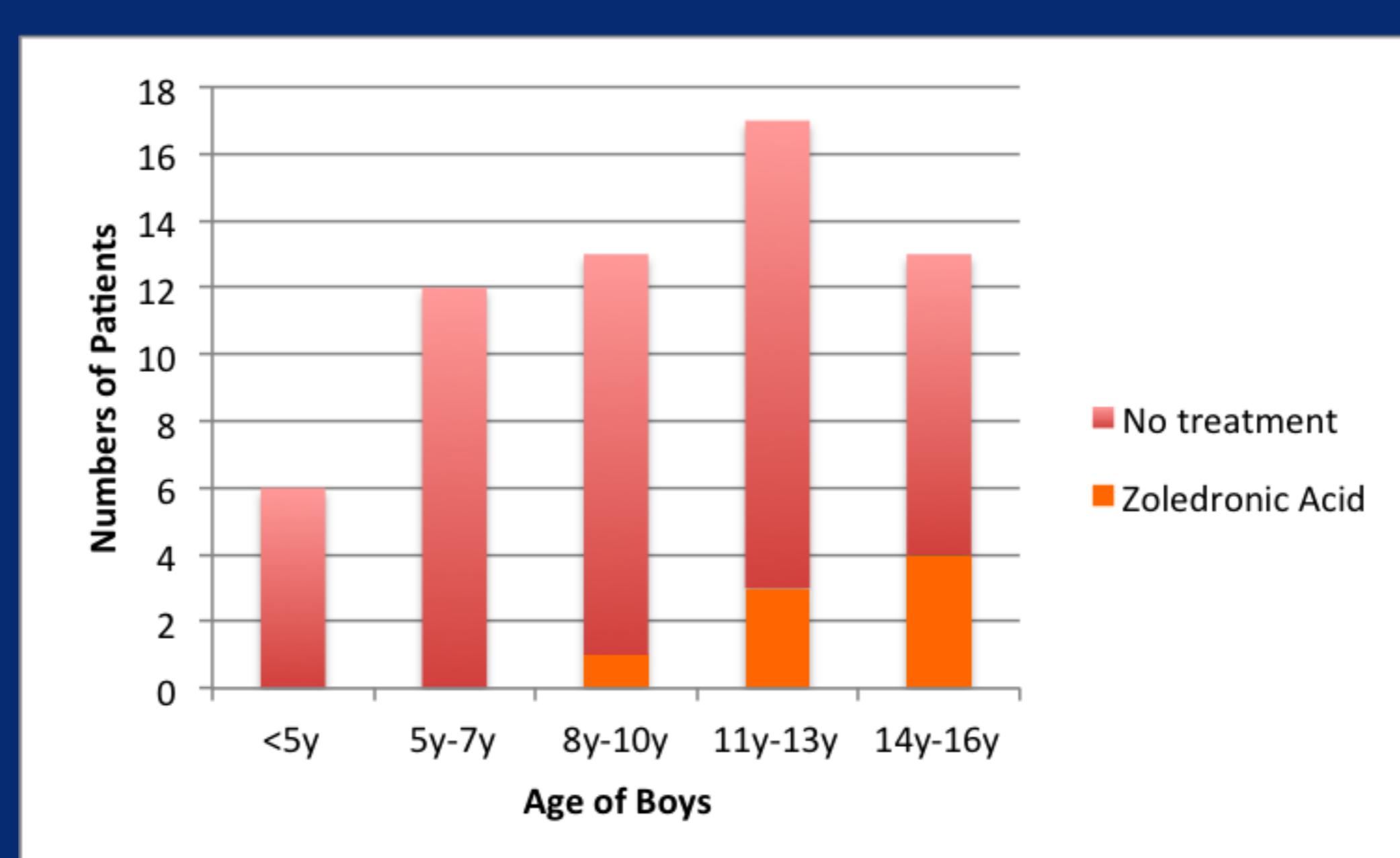


Figure 2

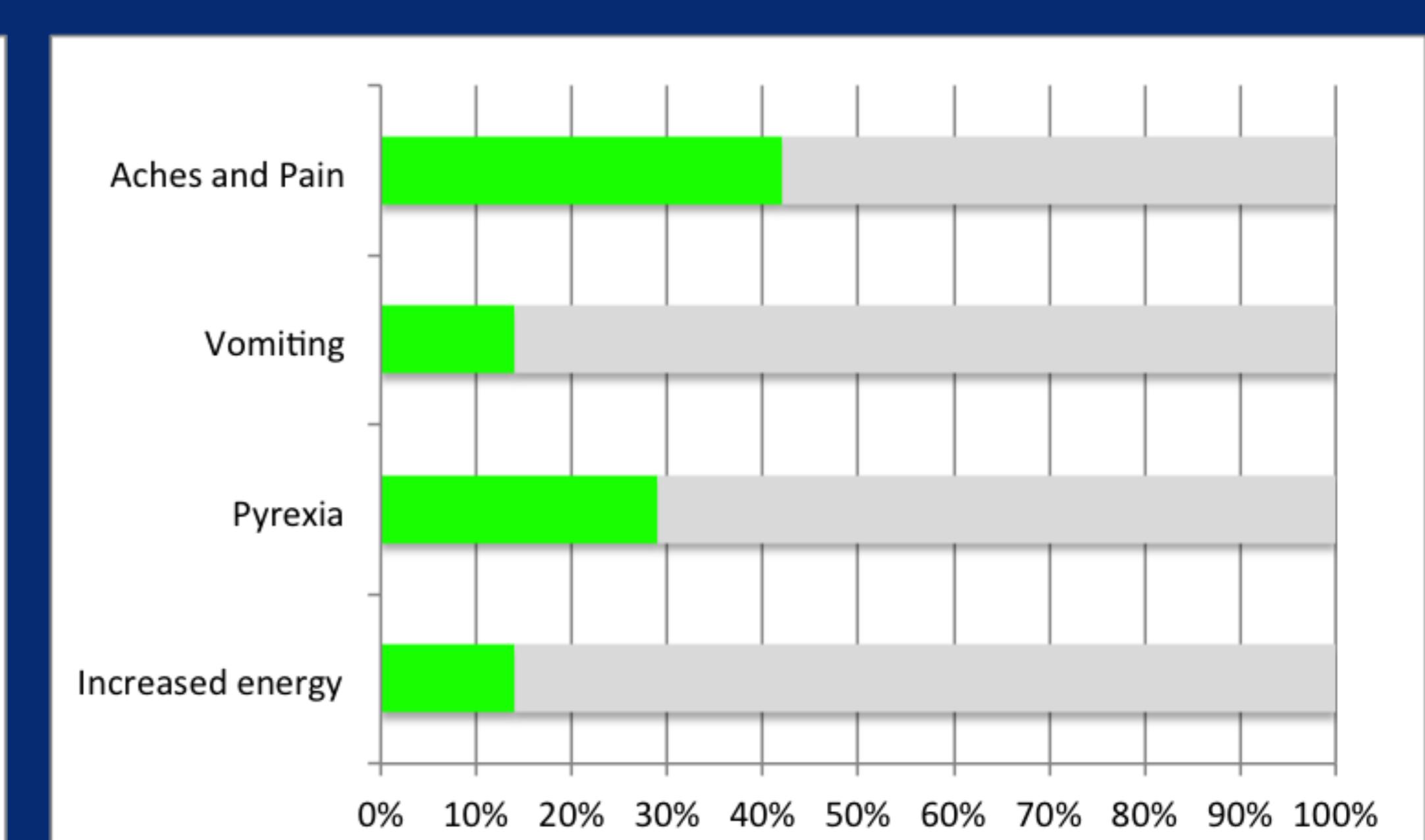


Figure 3

All DMD boys with osteoporosis were in power wheelchairs and had on average been treated for 8 years on corticosteroids. 43% of them had pubertal delay. Side effects after first infusion (figure 3) included pyrexia (29%), vomiting (14%), aches and pain (42%). Increased energy levels were noted in 14 % patients. All patients reported that the side effects were mild and tolerated well.

Conclusions:

11% of paediatric DMD patients were diagnosed with osteoporosis and started on treatment with zoledronic acid. This was well tolerated with only minor short-term side effects being reported.

