How are we using bisphosphonates in children with secondary osteoporosis in a tertiary centre?

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**Background**
Secondary osteoporosis (2^o OP):

1. Significant fracture history in absence of trauma
   - 1 or more vertebral fracture
   - 2 or more long bone fractures by age 10
   - 3 or more long bone fractures by age 19
2. BMD z score <2

- Large cohort of patients including those on long term steroids and with significant immobility
- Use of bisphosphonates (BPs) is anecdotally reported to increase bone mineral density (BMD), decrease fractures and decrease bone pain
- Not currently enough evidence to support use of BPs as standard therapy

**Objective**
We appraised our current practice of BP use in children with 2^o OP or with low BMD and significant symptoms.

**Method**
- 59 patients treated with BPs over a 7-year period
- Average follow up 42.2 months (range 6-96)
- Data collected on demographics, changes in BMD Z-score, fracture rates, bone pain and adverse effects

**Results**
- Children were included with the following conditions:
  - Neurodisability (n=28)
  - Duchenne muscular dystrophy (n=15)
  - Rheumatology — juvenile arthritis, juvenile systemic lupus erythematosus (n=9)
  - Oncology — acute lymphoblastic leukaemia (n=4)
- Mean age of commencing treatment was 12.75 years (4-24)
- Maximum duration of treatment was 5 years
- Increase in use of Zoledronic Acid
- Treatment tolerated well in 75%
- Infrequent minor complications, including venous access issues, were reported in the rest

![Bone Mineral Density vs Fracture Incidence vs Presence of Bone Pain](Image)

*Figure 2. Percentage change, pre and post bisphosphate*

**Bone mineral density**
- Mean Z-score increased from -3 pre-BP to -2.36 post treatment.
- p = 0.0043 with Wilcoxon signed-rank test of the paired scores (n=28).

**Fracture incidence**
- 78% had long-bone and/or vertebral fractures prior to BP treatment.
- This decreased to 10% post BP.

**Presence of bone pain**
- 49% reported bone pain prior to BP.
- Of these with bone pain, 10% still reported pain after starting treatment.

**Patient feedback:**
- “She is sleeping better and handling better since the bisphosphonate treatment started.”
- “Pain much better with Pamidronate. More mobile and energetic.”
- “She previously hated to be touched and is now much more comfortable. She no longer cries when she is washed and dressed. Her analgesia has also been reduced.”

**Conclusion**
- Bisphosphonate use in a heterogeneous group of children with symptomatic low BMD or 2^o OP resulted in increased BMD, and decreased fractures and pain.
- The treatment was well tolerated, and Zoledronic Acid is increasingly being used.
- Longer term follow up of this cohort is required, along with future prospective studies using robust methods of measuring quality of life.

**References**

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