Bisphosphonates for the management of children/youth with cerebral palsy at risk of osteoporosis: A systematic review and meta-analysis using GRADE

Preliminary Findings

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Introduction

- Cerebral palsy (CP) is the most common motor disability in childhood, and can have various clinical impacts including low bone mineral density (BMD).
- Although often asymptomatic, low BMD can result in painful fragility fractures.

Evidence for Bisphosphonate use

'Probably effective' at improving BMD 'Possibly effective' at reducing fragility fractures

This review will establish the current level of evidence using the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) approach for bisphosphonates for the treatment of low BMD in CP

Research Question

The systematic review will address the following question: among children and young people with CP and at risk of osteoporosis, what is the effect of bisphosphonates, compared to usual care, on BMD and fracture rate, at least one year following initiation of treatment?

Methods

Study Design: Systematic Review & Meta-analysis

Databases Searched: Ovid MEDLINE, CINAHL, AMED, Embase, Cochrane Reviews, ECM reviews, and clinical trial registries

Inclusion Criteria

- Minimum 10 Participants
- Randomized or non-randomized studies
- Report BMD/BMC or fracture rate
- Published ≤18 years old

Conclusions

As the mean difference (MD) is greater than the clinical threshold, bisphosphonates, compared to usual care, may improve lumbar and femoral BMD, at least 12 months after initiation of treatment (GRADE very low certainty).

The 65% relative risk reduction in fracture rate exceeds the clinical threshold of 15%. Bisphosphonates, compared to usual care, may reduce fracture rate over a follow-up period greater than 2 years (GRADE very low certainty).

Relevance to Holland Bloorview Clients & Families

The evidence from this systematic review will inform an updated clinical practice guideline and care pathway, to help clients, families and clinicians choose a management option for low BMD in cerebral palsy.

Acknowledgements

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References

- Bisphosphonates for the management of children/youth with cerebral palsy at risk of osteoporosis: A systematic review and meta-analysis using GRADE
- Preliminary Results
- Lumbar BMD: 50, Mean Difference (MD) 1.77, 95% CI 1.31-2.23
- Femoral BMD: 17, Mean Difference (MD) 1.26, 95% CI 0.43-2.10
- Figure 1. Forest plot of random effects meta-analysis for fracture rate pre- and post-bisphosphonates, follow-up: 2 to 6.1 years
- Table 1. Random effects meta-analysis pre- and post-bisphosphonates, > 12 months following initiation of treatment
- Conclusions
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