

Randomized Clinical Trial Of Bisphosphonate Treatment In Childhood Femoral Head Avascular Necrosis Due To Perthes Disease: Study Design, Methods And Baseline Data

^{1,2}Jamil K, ³Cowell C, ⁴Munns C, ⁴Zacharin M, ⁴Foster B, ²Little D

¹Department of Orthopaedic & Traumatology, Medical Faculty, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia, ²Orthopaedic Research and Biotechnology, The Children's Hospital at Westmead, University of Sydney, Sydney, Australia, ³Kids Research Institute, The Children's Hospital at Westmead, Sydney, Australia, ⁴Institute of Endocrinology and Diabetes, The Children's Hospital at Westmead, Discipline of Paediatrics and Child Health, University of Sydney, Sydney, Australia.

INTRODUCTION:

Perthes disease (PD) occurs following loss of blood supply to the hip which can result in flattening. The use of Zoledronic Acid (ZA) to prevent osteoclastic resorption, is aimed at preserving femoral head strength and maintaining its shape. Clinical case studies and experimental animal research regarding the effect of bisphosphonates on osteonecrosis have shown encouraging results [1,2]. A multicentre, prospective, randomised controlled trial of 12 months ZA in children with Perthes disease was conducted. This is the first description of an Australian cohort of children with PD.

MATERIALS & METHODS:

Inclusion criteria are: >5y/o, acute onset and unilateral PD. The intervention attempts to stem collapse of the femoral head as a result of bone resorption, therefore children who already have collapsed are not enrolled. The lateral pillar classification (Fig.1) is used to define the population such that femoral heads with a lateral pillar >50% of the height of the unaffected side were included (Lateral pillar A or B)[3].

The primary outcome measure is deformity index (DI) at 24 months. Secondary outcome measures are femoral head subluxation, FACES pain scale, Harris hip score and quality of life. The patients are randomised into two treatment arms: a)Standard care or b)Zoledronic acid and standard care

RESULTS:

Data analysis involving 83 patients was performed on baseline parameters which include age, demography, anthropometry, comorbidities, serum biochemistry, bone age, hip range of motion, treatment history and secondary outcome measures. At screening, there was no significant difference of any of the parameters between the treatment arms. Subjects as a group were overweight (weight z

score 0.32 ± 1.28 $p=0.03$ and BMI z-score 0.53 ± 1.21 $p=0.00$) and had delayed bone age (mean bone age 7.1 ± 2 vs chronological age 7.8 ± 1.5 $p=0.00$). Their affected limbs showed reduced abduction range which is also reflected by their low hip and quality of life scoring. All biochemistry was within normal limits.

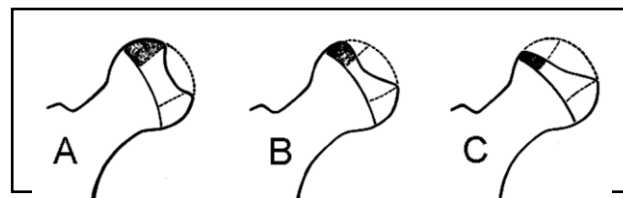


Fig1:Lateral Pillar Classification [3]

DISCUSSIONS:

We designed an open label, multicentre trial involving five children hospital in Australia (Sydney, Melbourne, Brisbane, Perth and Adelaide). The main aim is to evaluate the efficacy of treatment on preservation of femoral head shape, hip function, hip pain and safety at 24 months. The baseline data showed an expected bone age delay pattern and typical reduction of range of motion at acute stage. The overweight factor is something to be considered during outcome analysis.

CONCLUSION:

The Australian PD cohort exhibited clinical phenotype similar to overseas cohorts. For the study moving forward, the screening data showed no evidence of randomisation bias between the treatment groups

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