EFFECTS ON INFANT GROWTH AND NEURODEVELOPMENT OF REPEAT DOSE PRENATAL CORTICOSTEROIDS TO WOMEN AT RISK OF PRETERM BIRTH: A RANDOMISED CONTROLLED TRIAL.

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ABSTRACT

Introduction

A single course of prenatal corticosteroids offers no benefits for infants born seven days after treatment. Repeat corticosteroid treatment may improve health outcomes, but with possible adverse effects. This thesis aimed to examine the effects of repeat prenatal corticosteroids on infant growth and neurodevelopment.

Methods

Women at risk of preterm birth more than seven days after a single course of prenatal corticosteroids, who gave informed written consent, were randomised to receive weekly repeat dose corticosteroids or placebo, if still at risk, until 32 weeks gestation. Infant growth was assessed at birth, day three, weekly to four weeks, monthly to four months of age and at 7¼ months corrected age (CA). Neurodevelopmental milestones were assessed at four and eight months CA and novelty preference at 7 ¼ months CA.

Results

One hundred and forty seven infants were randomised. Repeat corticosteroid treatment reduced the weight z-score at birth, four months following birth and at 7¼ months CA, compared with placebo. Total body length z-score and knee-ankle length were reduced at birth for repeat corticosteroid infants, compared with placebo. Total body length z-score was unaffected by repeat corticosteroid treatment from day three to 7¼ months CA. Knee-ankle length was reduced with repeat corticosteroid exposure up to three months following birth, compared with placebo. Head circumference z-scores were unaffected by repeat

corticosteroid treatment from birth to 7¼ months CA. Repeat corticosteroids reduced personal-social development at eight, but not four months CA, compared with placebo. Repeat corticosteroids did not reduce communication, gross motor, fine motor and problem solving scores at four or eight months CA, did not increase the number of infants screened at risk of developmental delay and did not reduce novelty preference, compared with placebo.

Conclusions

Repeat prenatal corticosteroids reduce weight, length and knee-ankle length at birth, although only infant weight remained reduced at 7¼ months CA. No adverse effects on infant neurodevelopment were seen for repeat corticosteroid treated infants, apart from a reduction in personal-social development at eight months CA. Confirmation of and further assessment as to the long-term consequences of these observed effects is required.

DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to a copy of my thesis, when deposited in the University Library, being available for loan and photocopy.

Kristin McLaughlin

January 2003

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AUTHOR'S CONTRIBUTION

I was responsible for the conceptualisation, design and development of the protocols and coordination of The In-depth Growth and Neurodevelopment Trial. I sought ethics approval from the Women's and Children's Hospital Ethics Committee for the trial, developed the data collection forms and obtained the required equipment (excepting the neonatal knemometer). I was responsible for arranging all appointments for the growth and neurodevelopmental assessments and pursuing missed appointments. All growth and neurodevelopmental data were collected by myself, at the Women's and Children's Hospital, at other local and regional hospitals or by home visit as required. I was responsible for sending all four and eight month neurodevelopment questionnaires and pursuing overdue developmental questionnaires by post and telephone and traced 'lost' participants in the trial by telephone when required.

The ACTORDS Trial (Australasian Collaborative Trial of Repeat Doses of Corticosteroids for the Prevention of Neonatal Respiratory Disease) coordinator, Ms Pat Ashwood, primarily conducted recruitment to the ACTORDS Trial and the completion of the ACTORDS Trial data forms, though I assisted in these tasks when required.

I was responsible for the entry and cleaning of all the data presented in this thesis. I undertook all statistical analyses, with guidance from Ms Kristyn Willson, our statistician.