

## The effect of betamethasone administration on uterine motility in pregnancy. A prospective study using four-channel tocography

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### Abstract

We monitored 30 patients before and after betamethasone prophylaxis using four-channel tocography to evaluate if betamethasone therapy in the case of imminent preterm delivery increases uterine activity. Frequency of contractions slightly increased but global uterine activity decreased. We conclude that the changed contraction pattern did not impair the benefits of RDS prophylaxis.

**Keywords:** Betamethasone; four-channel tocography; preterm labor; respiratory distress syndrome (RDS); uterine motility.

### Introduction

The prophylactic treatment for neonatal respiratory distress syndrome (RDS) by maternal antepartum betamethasone has become routine management in pregnancies at risk of preterm delivery [2]. However, it has occasionally been reported that patients complained about increased uterine contractions after intramuscular administration of the drug. It has been suggested that this therapy may even raise the risk of preterm birth and counterbalance the effect of RDS prophylaxis. Our study was undertaken to clarify whether intramuscular administration of betamethasone has a measurable effect on uterine contractions.

### Material and methods

Between February and August 1998, 30 patients (singleton pregnancy, 24 to 34 weeks of gestation) who were hospitalized because of preterm labor and who gave their informed consent

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were included in the study. Ten patients were treated with intravenous tocolysis but the tocolytic dosages remained constant during RDS prophylaxis. Each patient received  $2 \times 12$  mg/48 h intramuscular betamethasone according to the standard protocol of our clinic.

Uterine motility was monitored using four-channel tocography with four external transducers on the abdomen above the left/right fundal and left/right caudal segments of the uterus [3]. For each patient three four-channel tocograms were performed: the first directly before, the second 2 h after and the third 5 h after betamethasone administration. Duration of monitoring was between 60 and 90 min. The values of two variables were calculated for each recording:

1. Contraction frequency: number of contractions per hour recorded in at least one channel.
2. Globality of contractions: number of simultaneous contractions in three or four channels as a percentage of all registered contractions.

Mean values and the range were determined for the three measurements. Central tendencies of the initial frequency and globality were statistically compared with those that have been recorded 2 h after treatment. The level of statistical significance was expressed by the P-value of the Wilcoxon-test for paired data.

Cervical condition was assessed in all cases by palpation (using the Bishop score) and transvaginal ultrasound measurement of the cervical length on the days before and after treatment.

### Results

The mean contraction frequency was initially 5.5/h (0 to 12) and changed to 6.7/h (1.3 to 14.4,  $P=0.03$ ) at 2 h and to 5.8/h (0.7 to 10.7) 5 h after beginning of treatment (Figure 1).

The mean globality of contractions was initially 37% (0 to 75) and changed to 25% (0 to 83,  $P=0.09$ ) at 2 h and to 26% (0 to 67) 5 h after beginning of treatment (Figure 2).

Cervical condition before and after treatment remained unchanged by means of ultrasound and palpation in all patients.

### Comment

We found in our study a statistically significant increase of uterine contraction frequency after betamethasone

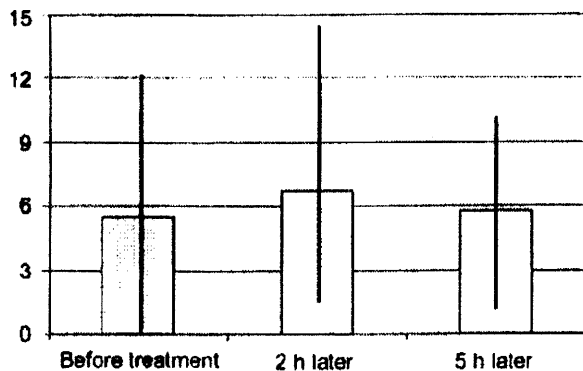


Figure 1 Contractions per hour (mean, minimum and maximum).

administration. Elliott and Radin found similar effects in high-order multiple gestations [1] but due to the higher prenatal risks in their study group, the extent of betamethasone treatment on uterine motility might not be comparable to our findings.

The self-perception of increasing uterine motility after RDS prophylaxis is confirmed by our results. From the

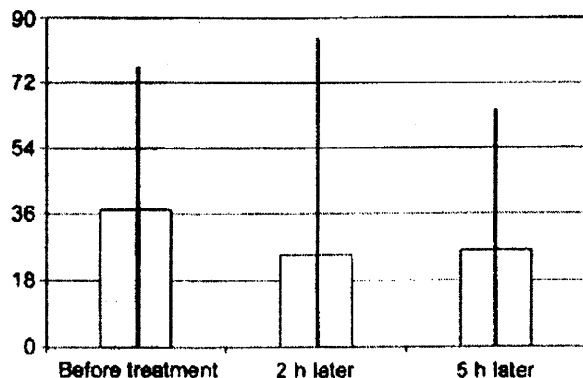


Figure 2 Globality of uterine activity in % (mean, minimum and maximum).

obstetrical point of view, the increase of the contraction frequency does not appear to be relevant. In another study we have shown that the sensitivity of pregnant women for self-perception varies interindividually on a wide range [3]. This may explain why relatively few patients had perceived the temporary increase of uterine activity. In the third measurement, performed 5 h after the betamethasone injection, the mean contraction frequency had almost returned to baseline value.

Other studies demonstrated that four-channel tocograms showing a high percentage of global contractions were often combined with premature cervical dilatation and delivery. In the present study, global contractions decreased after betamethasone administration. This could indicate a reduced efficiency of the registered uterine motility.

Finally, no effect on the cervix could be observed. Knowledge of a temporarily increased contraction frequency is therefore no argument against RDS prophylaxis with betamethasone.

#### Acknowledgement

Supported by Deutsche Forschungsgemeinschaft, Bad Godesberg, Germany.

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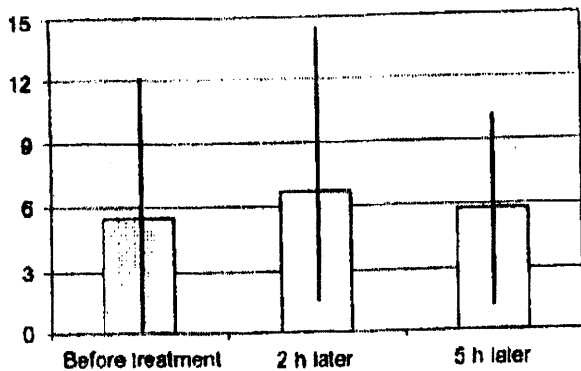


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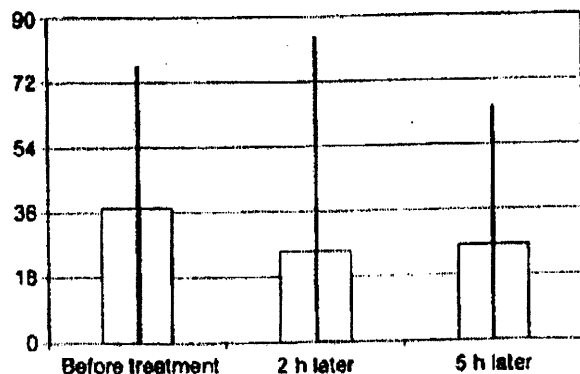


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