



# Betametazonun Fetoplasental ve Maternal Hemodinami Üzerindeki Etkisi

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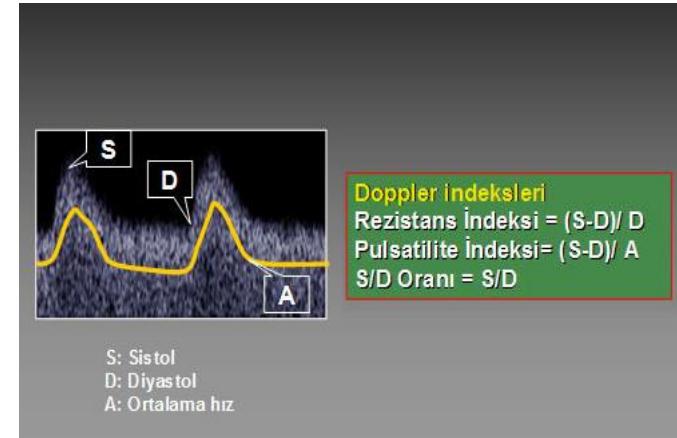
# Amaç

- ❖ Preterm doğum riski olan gebelerde antenatal betametazon
  - Umbilikal arter
  - Uterin arterler
  - Orta serebral arter (MCA)
  - Duktus venozus (DV)
  - Serebroplasental oran (CPR) Doppler ultrasonografi (USG) indeksleri
  - Amniyon sıvı indeksi (AFI)

*üzerindeki olası etkileri !!!*

# Yöntem

- ❖ 24-34 gestasyonel hafta arası
- ❖ 68 gebe, tek uzman
- ❖ 24 saat arayla 2 defa 12mg betametazon
- ❖ Betametazon öncesi (0.saat) ve ilk dozundan sonraki 24, 48, 72. saatteki,
  - Rezistif indeks (RI)
  - Pulsatilite indeksi (PI)
  - Sistol/diastol (S/D)
  - Peak-sistolik (PS) akım
  - End-diastolik (ED) akım
  - CPR
  - AFI miktarları



*Betametazon öncesi ve sonrasındaki  
olası farklılıklar !!!*

# Dışlama Kriterleri

- ❖ Betametazon ilk dozunu takiben 72 saatten önceki doğumlar
- ❖ UA end-diastolik akım kaybı veya ters akım
- ❖ Fetal yapısal anomaliler
- ❖ Fetal genetik hastalıklar
- ❖ EMR

# istatistiksel Analiz

- ❖ Repeated Measures ANOVA
- ❖ Friedman ANOVA
- ❖ Bonferroni post-hoc

Characteristics	Values
<b>Age (Mean±SD)</b>	26.1±6.4
<b>Gravida (Median (Min-Max))</b>	1.0 (1-10)
<b>Parite (Median (Min-Max))</b>	0 (0-7)
<b>Gestational week at betamethasone administration (Mean±SD)</b>	$29^{5/7} \pm 2^{3/7}$ w
<b>Gestational week at birth (Mean±SD)</b>	$35^{2/7} \pm 3^{4/7}$ w
<b>Caesarean section (n (%))</b>	42 (61.7%)
<b>Vaginal delivery (n (%))</b>	26 (38.2%)
<b>APGAR at 1<sup>st</sup> minute (Median (Min-Max))</b>	9 (3-10)
<b>APGAR at 5<sup>th</sup> minute (Median (Min-Max))</b>	10 (6-10)
<b>Fetal weight at birth (Mean±SD) (g)</b>	2423.9±821.8
<b>Fetal height at birth (Mean±SD) (cm)</b>	45.1±4.8
<b>NICU Administration (n (%))</b>	16 (%23.5)
<b>Gender</b>	
<b>Female (n (%))</b>	34 (50%)
<b>Male (n (%))</b>	34 (50%)
<b>Preeclampsia</b>	3 (4.4%)
<b>Placenta previa/accreta</b>	7 (10.2%)

Vessel	Indices	0	24	48	72	p
	<b>PI</b>	1.01 ± 0.19	0.96 ± 0.18	1.0 ± 0.21	0.94 ± 0.16	<b>0.061</b>
	<b>RI</b>	0.63 ± 0.07	0.62 ± 0.07	0.63 ± 0.08	0.61 ± 0.06	<b>0.044*</b> , p <sup>0-72</sup> =0.038
<b>Umbilical artery</b>	<b>S/D</b>	2.88 ± 0.6	2.67 ± 0.46	2.82 ± 0.65	2.65 ± 0.51	<b>0.086</b>
	<b>PS</b>	39.77 ± 8.73	41.12 ± 9.85	40.99 ± 9.18	39.38 ± 10.38	<b>0.76</b>
	<b>ED</b>	14.14 ± 4.75	15.82 ± 5.1	15.27 ± 4.87	15.31 ± 5.18	<b>0.21</b>
	<b>PI</b>	1.66 ± 0.3	1.64 ± 0.32	1.65 ± 0.4	1.57 ± 0.54	<b>0.33</b>
	<b>RI</b>	0.8 ± 0.07	0.79 ± 0.07	0.78 ± 0.08	0.78 ± 0.14	<b>0.27</b>
<b>Middle cerebral</b>	<b>S/D</b>	6.93 ± 8.64	5.8 ± 6.54	5.85 ± 6.26	5.63 ± 7.68	<b>0.012*</b> , p <sup>0-72</sup> =0.007
<b>artery</b>	<b>PS</b>	34.54 ± 11.89	33.1 ± 10.07	35.25 ± 8.58	35.94 ± 9.37	<b>0.25</b>
	<b>ED</b>	7.13 ± 5.76	6.84 ± 2.94	7.58 ± 3.28	8.33 ± 3.43	<b>0.003*</b> , p <sup>0-72</sup> =0.017 p <sup>24-72</sup> =0.013
	<b>PI</b>	0.76 ± 0.32	0.8 ± 0.27	0.79 ± 0.32	0.81 ± 0.28	<b>0.48</b>
	<b>RI</b>	0.54 ± 0.14	0.58 ± 0.14	0.56 ± 0.16	0.58 ± 0.14	<b>0.20</b>
<b>Ductus venosus</b>	<b>S/a</b>	2.46 ± 1.04	2.81 ± 1.16	3.01 ± 2.29	2.85 ± 1.16	<b>0.06</b>
	<b>S</b>	46.05 ± 14.84	42.08 ± 13.29	45.44 ± 14.46	41.67 ± 12.08	<b>0.20</b>
	<b>ED</b>	22.02 ± 11.73	19.58 ± 11.77	20.89 ± 12.11	17.93 ± 9.55	<b>0.07</b>

VESSELS»	Indices	0	24	48	72	p
	<b>PI</b>	0.95 ± 0.37	0.96 ± 0.37	0.94 ± 0.42	0.96 ± 0.46	<b>0.97</b>
	<b>RI</b>	0.55 ± 0.11	0.55 ± 0.11	0.54 ± 0.12	0.55 ± 0.12	<b>0.55</b>
<b>Right uterine</b>	<b>S/D</b>	2.51 ± 1.06	2.47 ± 0.84	2.5 ± 1.25	2.57 ± 1.51	<b>0.73</b>
<b>artery</b>	<b>PS</b>	57.1 ± 20.67	65.47 ± 31.83	59.97 ± 21.22	65.11 ± 26.55	<b>0.20</b>
	<b>ED</b>	26.0 ± 11.8	29.44 ± 16.96	27.78 ± 12.76	29.11 ± 15.61	<b>0.26</b>
	<b>PI</b>	0.97 ± 0.43	1.04 ± 0.49	1.0 ± 0.44	0.99 ± 0.43	<b>0.97</b>
	<b>RI</b>	0.55 ± 0.12	0.57 ± 0.11	0.56 ± 0.11	0.55 ± 0.12	<b>0.80</b>
<b>Left uterine</b>	<b>S/D</b>	2.49 ± 1.01	2.65 ± 1.18	2.56 ± 1.13	2.55 ± 1.15	<b>0.75</b>
<b>artery</b>	<b>PS</b>	72.06 ± 31.96	69.77 ± 30.86	66.3 ± 36.65	70.23 ± 30.16	<b>0.64</b>
	<b>ED</b>	33.7 ± 20.3	30.15 ± 17.36	30.43 ± 14.73	32.24 ± 18.59	<b>0.70</b>
	<b>CPR</b>	1.7 ± 0.53	1.72 ± 0.45	1.73 ± 0.57	1.79 ± 0.79	<b>0.47</b>
	<b>AFI</b>	13.84 ± 5.04	13.33 ± 4.73	12.73 ± 4.62	12.7 ± 4.44	<b>0.009*, p<sup>0-48</sup>=0.02</b>
						<b>p<sup>0-72</sup>=0.012</b>

## The effect of steroids on the biophysical profile and Doppler indices of umbilical and middle cerebral arteries in healthy preterm fetuses

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Received 11 October 2000; received in revised form 21 February 2001; accepted 28 February 2001

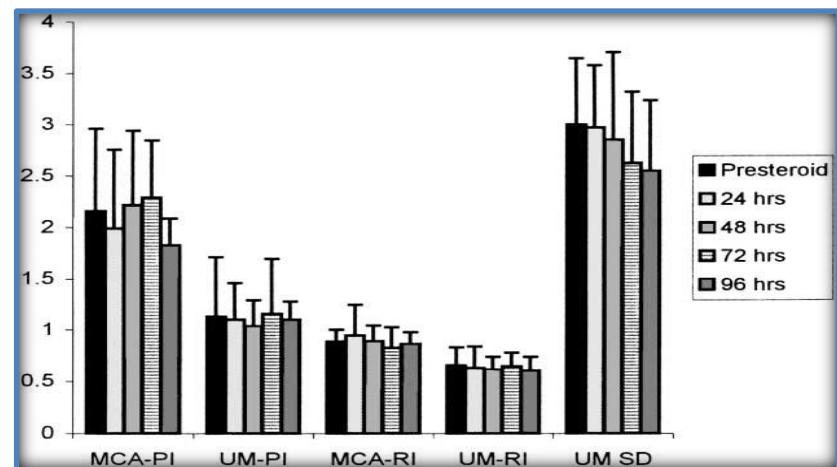
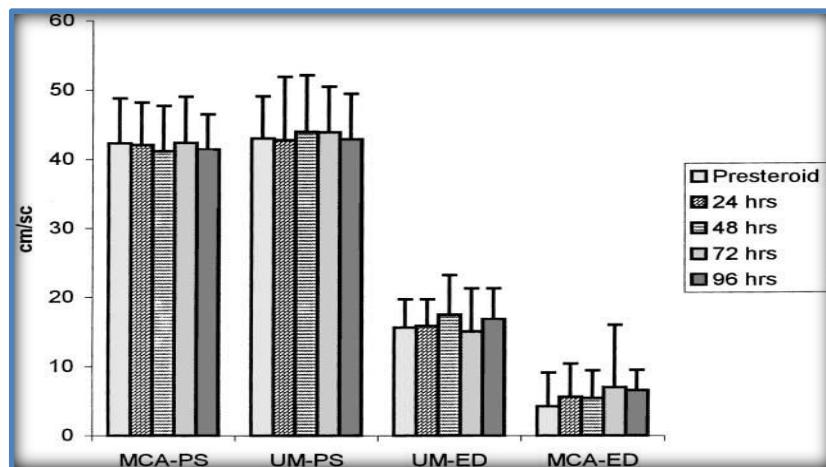
### Abstract

**Objective:** To examine the effect of antenatal steroids on the biophysical profile and the Doppler parameters of umbilical and middle cerebral arteries of healthy fetuses. **Study Design:** Thiry-five singleton pregnancies between the gestational ages of 28 and 34 weeks, who received two consecutive doses of betamethasone 24 h apart to accelerate pulmonary maturation were prospectively studied. Fetal biophysical profile and Doppler assessment were performed at 0 (pre-steroid), 24, 48, 72, 96 and 120 h after the administration of first dose. We compared the percentage of the fetuses with biophysical parameters present for each of the five components of the biophysical profile and the Doppler indices, using Cochran's Q-test, Friedman's test and one way analysis of variance of repeated measures where appropriate. The statistical significance was defined as  $P < 0.05$ . **Results:** The mean delivery time was  $36.9 \pm 1.8$  weeks. There was a statistically significant difference in the frequency of the following findings in the pre- compared to post-steroid measurements: absence of body movements ( $48\text{ h}$ ,  $P < 0.05$ ), non-reassuring fetal heart rate tracings (24, 48 and 72 h,  $P < 0.05$ ) and absence of breathing movements (24, 48 and 72 h,  $p < 0.05$ ). Initially none of the biophysical profile score was  $\leq 6$ , whereas at 24, 48 and 72 h, 13.3, 76.7, 16.7% of them, respectively, were  $\leq 6$  ( $P < 0.05$ ). None of the Doppler indices was found to be affected by the steroid administration. **Conclusion:** Maternal betamethasone administration can cause a significant but transient reduction in biophysical profile scores, however the middle cerebral and umbilical artery Doppler indices were found to be unaffected suggesting the reliability of this modality for the evaluation of the fetuses previously exposed to the antenatal steroids. © 2001 Elsevier Science Ireland Ltd. All rights reserved.

### 3. Results

Thirty of the original 35 received all six biophysical profiles and all five Doppler studies. On admission the mean maternal age (S.D.) of this group was  $29.7 \pm 3.1$  years (23–35) and the mean gestational age (S.D.) was  $31.2 \pm 1.5$  weeks (28–34). Twenty-five normal fetuses were delivered between 33 to 40 weeks (mean  $36.2 \pm 2.41$ ). All had 5 min APGAR scores of  $\geq 8$ .

Fig. 1 summarizes the findings and shows the percentage of the fetuses with each of the biophysical parameters present. Amniotic fluid index and tonus was unaffected by the administration of antenatal steroids and remained constant throughout the study period. The presence of fetal body movements (RM) showed a decrease at 24, 48 and 72 h



# Changes in fetoplacental vessel flow velocity waveforms following maternal administration of betamethasone

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**Table 1** Median fetal vessel flow velocity waveform pulsatility indices and fetal heart rates in 12 pregnancies before and after maternal betamethasone

Vessel	Baseline	4 h	8 h	12 h	24 h	Significance
Umbilical artery	2.5	2.5	1.6	1.4	1.6	<i>P</i> = 0.00001*
Aorta	3.0	2.9	2.6	2.4	2.9	<i>P</i> = 0.046*
Middle cerebral artery	1.6	1.5	1.5	1.3	1.1	<i>P</i> = 0.02†
Renal artery	2.2	2.9	2.5	1.8	2.0	NS
Ductus venosus	1.0	0.8	0.8	0.9	1.0	NS
Fetal heart rate (bpm)	141	143	145	143	144	NS

\*Significant at 8 h. †Significant at 24 h. NS, Not significant.

# Effect of maternal betamethasone on fetal and uteroplacental blood flow velocity waveforms

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## ABSTRACT

**Objectives** To investigate the effects of antenatal betamethasone on fetal and uteroplacental hemodynamics.

**Methods** The study comprised 33 women with singleton high-risk pregnancies (23–33 weeks: 27 pregnancies <30 weeks) not in labor, but at risk for preterm delivery based on fetal or maternal indications. They were treated with two doses of 12 mg betamethasone intramuscularly 24 h apart to enhance fetal lung maturity. Flow velocity waveforms were recorded with Doppler ultrasound from the umbilical artery, the fetal middle cerebral artery, the ductus venosus and both maternal uterine arteries, once before and twice after betamethasone administration.

Table 2 Results of Doppler velocimetry before and after maternal betamethasone

	Control period		2 days after treatment			4 days after treatment		
	n	Median (range)	n	Median (range)	P*	n	Median (range)	P*
<b>Pulsatility index (PI)</b>								
Umbilical artery PI	18‡	1.91 (1.61–2.48)	13	1.46 (0.84–1.79)	0.0002	11	1.43 (1.22–2.33)	0.06
Ductus venosus PI	20§	0.69 (0.35–1.25)	17	0.43 (0.3–0.84)	0.003	12	0.55 (0.33–1.18)	0.11
Middle cerebral artery PI	24	1.29 (0.77–1.95)	21	1.09 (0.95–1.63)	0.06	12	1.27 (0.96–1.65)	0.06
Right uterine artery PI	24	1.54 (0.59–2.41)	21	1.55 (0.49–2.94)	0.17	12	1.87 (0.42–3.7)	0.97
Left uterine artery PI	24	1.58 (0.49–3.67)	21	1.56 (0.45–3.0)	0.65	12	1.81 (0.66–7.61)	0.42

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)European Journal of Obstetrics & Gynecology and  
Reproductive Biology 120 (2005) 170–174EUROPEAN JOURNAL OF  
**OBSTETRICS &  
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AND REPRODUCTIVE BIOLOGY[www.elsevier.com/locate/ejogrb](http://www.elsevier.com/locate/ejogrb)

## Antenatal corticosteroid therapy: a comparative study of dexamethasone and betamethasone effects on fetal Doppler flow velocity waveforms

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Received 14 June 2004; received in revised form 4 September 2004; accepted 23 September 2004

Table 1

Umbilical (UA), fetal middle cerebral (MCA) blood velocity values and number of abnormal fetal heart rate (FHR) patterns before treatment, 24 and 72 h after the first dose of dexamethasone

	Before treatment	24 h after first dose	Significance (p)	72 h after first dose	Significance (p)
UA PI	0.98 ± 0.17	0.94 ± 0.1	NS	0.93 ± 0.13	NS
MCA PI	2 ± 0.43	1.84 ± 0.34	NS	1.68 ± 0.31	0.0001*
MCA PI/UA PI	2.09 ± 0.51	2.04 ± 0.46	NS	1.83 ± 0.4	0.0137*
Abnormal FHR patterns (%)	0	6 (17.6%)	NS	4 (11.8%)	NS

\* Statistically significant differences at 0.05 significance level.

Table 2

Umbilical (UA), fetal middle cerebral (MCA) blood velocity values and number of abnormal fetal heart rate (FHR) patterns before treatment, 24 and 72 h after the first dose of betamethasone

	Before treatment	24 h after first dose	Significance (p)	72 h after first dose	Significance (p)
UA PI	0.97 ± 0.16	0.92 ± 0.015	NS	0.92 ± 0.15	NS
MCA PI	1.93 ± 0.41	1.74 ± 0.29	NS	1.79 ± 0.32	NS
MCA PI/UA PI	2.04 ± 0.51	1.97 ± 0.64	NS	2.01 ± 0.53	NS
Abnormal FHR patterns (%)	0	7 (21.2%)	NS	3 (9.1%)	NS

\* Statistically significant differences at 0.05 significance level.

# Sonuç

- ❖ 72.saatte UA direnci azalmakta
- ❖ 72.saatte beyin kan akımına olumlu etkiler
- ❖ Kan akımlarına olan olumlu etkiler uygulama sonrası 48. saatte saptanmamakta
- ❖ Ut.A ve DV Doppler indekslerinde değişim yok
- ❖ Betametazon, uygulamadan 72 saat sonra amniyon sıvısında azalma
  - Periferde, özellikle de renal arterlerde olası kan akımında azalma ???

**TEŞEKKÜRLER...**