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### Evaluation Of Isotonic 'Sports Drinks' In Labor

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**Introduction:** Many obstetric units restrict women to water only during labor in an attempt to prevent pulmonary aspiration. Some argue that prolonged fasting during labor has never been proven to influence the incidence of pulmonary aspiration and that fasting may be detrimental to labor outcome.<sup>1</sup> Consuming a light diet during labor prevents the metabolic response to fasting but also increases gastric volumes.<sup>2</sup> Isotonic drinks empty rapidly from the stomach and may provide a safer calorific alternative to solid food.

**Methods:** 60 women presenting in early labor (cervical dilatation <5cm) were randomized to receive either isotonic drinks (Group 1) or water only (Group 2) during labor. Plasma beta-hydroxybutyrate (BHB), non-esterified fatty acids (NEFAs) and glucose were measured in early labor (T1) and at the end of the first stage (T2). Residual gastric volume was assessed within 45 minutes after delivery using an ultrasound scanner. Incidence and volume of vomiting were recorded.

**Results:** There were no differences between the groups in any maternal or neonatal outcomes of labor. At T2, plasma BHB ( $P<0.001$ ) and NEFA ( $P<0.005$ ) had increased and plasma glucose ( $P<0.01$ ) had fallen significantly in the starved group (Group 2). Gastric antral cross-sectional areas after delivery were similar in the two groups. The incidence of vomiting and the amount vomited were also similar (Table 1).

Table 1: Mean plasma concentrations and gastric volumes

	Glucose (mmol/l)		BHB		NEFA	
	T1	T2	T1	T2	T1	T2
gp1 (n = 30)	5.33	5.59	0.19	0.11	0.65	0.63
gp2 (n = 29)	5.38	4.88	0.3	0.82	0.7	1.0
	Antral x-section area		%vomiting		volume	
gp1 (n = 30)	4.37cm <sup>2</sup>		23% (7/30)		280 ml	
gp2 (n = 30)	4.59cm <sup>2</sup>		17% (5/30)		215 ml	

**Conclusion:** Isotonic drinks reduce maternal ketosis in labor without increasing gastric volume.

### References:

1. Presented at International Confederation of Midwives 21st Congress: 1987.
2. Anaesthesia 1999; 54:329-334.

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Intracellular Receptors for cGMP and cAMP in Human Placenta. S.H. Francis, Ph.D.\*, R. Ramasubramanian, M.D.†, R.F. Johnson, B.S.†, J.D. Downing, M.D.†, J.D. Corbin, Ph.D.\*. Molecular. Physiology & Biophysics\* and Anesthesiology & Obstetrics†, Vanderbilt University Sch. of Med., Nashville, TN, USA 37232.

Cyclic GMP and cAMP modulate vascular smooth muscle tone and tissue perfusion. Intracellular receptors for cGMP and cAMP include cyclic nucleotide-dependent protein kinases [cGMP-dependent protein kinase (PKG) and cAMP-dependent protein kinase (PKA)] and cGMP-binding cyclic nucleotide phosphodiesterases (PDE). To examine roles of cGMP and cAMP in placental perfusion, the profile of PKG, PKA and PDEs in this tissue was studied. Soluble proteins derived from placenta procured from a normal full-term pregnancy were resolved using DEAE-Sepharose chromatography eluted with a linear salt gradient. Single peaks of PKG activity and PKA activity were found. Three properties identified the PKG activity as PKG $\alpha$ ; it eluted at ~0.13 M NaCl, was stimulated 3-fold by cGMP, and was activated by lower concentrations of 8-Br-cGMP than cGMP. PKG $\beta$  was not found. A major peak of cAMP-independent PKA activity representing free catalytic subunit (C subunit) of PKA eluted in initial column fractions; a [<sup>3</sup>H]cAMP-binding assay which detects free regulatory subunit (R subunit) of PKA and R subunit that is complexed with C subunit in PKA holoenzyme indicated that type I PKA is likely to be the major form of PKA in human placenta. PDE activity eluted in two peaks; total activity in each was approximately equal when assayed at near physiological cGMP (0.4  $\mu$ M). The first peak was identified as cGMP-binding cGMP-specific PDE (PDE5), which is abundant in vascular smooth muscle, and is the target for Viagra<sup>TM</sup> in treating vascular problems associated with erectile dysfunction. A broad second peak of activity hydrolyzed both cGMP and cAMP and was inhibited by cilostamide (200 nM), a specific PDE3 inhibitor, but not by rolipram (2  $\mu$ M), a specific PDE4 inhibitor. Cyclic GMP inhibited cAMP-PDE activity across this peak, which is consistent with the presence of PDE3, but the extent of cGMP inhibition varied; there was no cGMP-stimulation of cAMP hydrolysis suggesting absence of significant amounts of PDE2. Properties of PDE activities in the second peak, i.e., affinities and specificities for cAMP, cGMP, and selective PDE inhibitors suggests that it includes PDE3, and perhaps other unidentified PDEs. In conclusion, cyclic nucleotide receptors in human placenta include PKG $\alpha$ , type I PKA, PDE3, PDE5, and perhaps novel PDEs. These proteins are potential pharmacological targets for maladies associated with compromised placental perfusion.

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### The effect of position on haemodynamic stability during spinal anaesthesia.

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**Introduction.** Hypotension is common following spinal anaesthesia for Caesarean section (CS). The "Oxford" position (O) (left lateral with a wedge under the shoulder, 3 pillows under the head and a slight head down tilt) has previously been shown to be more stable than a sitting position[1] but has not been compared to the standard left lateral position (L) (pillows under patients head only).

**Method.** After ethics committee approval, 60 patients scheduled for elective CS were recruited. Exclusion criteria included hypertension, obesity and multiple pregnancy. Patients were randomised to either O or L position. After preload with 15 ml/kg Hartmanns solution, 2.5mls 0.5% bupivacaine in 8% dextrose with 15mcg fentanyl was injected intrathecally through a 25G Whitacre needle (hole cephalad) in L2/3 or L3/4 interspace. Group O were immediately turned to an identical right lateral position until ready for surgery, whilst group L were placed supine with 15° left lateral tilt. Non-invasive blood pressure (dependent arm) was measured every minute and ephedrine 6 mg administered in response to nausea or hypotension (80% of a mean of 3 systolic readings taken before intrathecal injection). Segmental block height was recorded at 5 minute intervals.

**Results.** Patients demographics were similar except for weight where group L were heavier. There was no significant difference in maximum fall in blood pressure, dose of ephedrine or fluids administered between the two groups. Blockade to T4 was achieved faster in group L. 7 patients had poor blocks- in group O 2 had inadequate blocks for CS (1 had an epidural sited, 1 converted to general anaesthesia) and 3 required additional analgesia (entonox or fentanyl); in group L 2 required additional analgesia. This was not statistically significant ( $p=0.42$ , Fisher Exact test).

	O mean (SD)	L mean (SD)	p value
Age	30.1 (6.32)	32.38 (5.29)	0.14 (t test)
Weight	72.88 (8.96)	78.5 (11.6)	0.042 (t test)
Max fall in BP	30.3 (15.4)	31.0 (13.2)	0.86 (t test)
Ephedrine	11.3 (11.3)	14.8 (11.9)	0.188 (Mann-Whitney)
Time to T4	10.36 (4.29)	6.67 (3.3)	0.0004 (Mann-Whitney)

**Discussion.** The slower onset of block associated with position O did not result in greater haemodynamic stability in this study. Slower onset might be associated with poor quality of block and pain relief, although this was not statistically significantly.

**References.** 1. Stoneham M. IJOA 1999;8(4):242-248

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### A Polymorphism of the Endothelial Nitric Oxide Synthase Gene is Associated with Pre-eclampsia

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**Introduction** Evidence implicating genetic factors in the pathogenesis of pre-eclampsia (PE) are numerous (1). The regulation of vascular tone has been correlated with genotypic variability (2) and is determined in part by circulating endothelium-derived vasoactive agents such as nitric oxide (NO). A polymorphism of the endothelial nitric oxide synthase (eNOS) gene on chromosome 7 has been described which results in a Glu→Asp substitution on codon 298 and has been associated with hypertension in Japanese patients (3). Our hypothesis is that PE may be preferentially associated with a particular genotype of the eNOS gene, which could contribute to the altered basal vascular tone and vascular response observed in PE.

**Methods** With IRB approval and informed consent, we collected blood samples from 35 Hispanic and Caucasian parturients with PE and 279 controls who delivered at term. The 2 ethnic groups were combined since there was no difference in genotype distribution in the control group. PE was diagnosed when hypertension (systolic >140 and/or diastolic > 90 mmHg) with proteinuria (>0.3g/24h) after 20 weeks of gestation were present, according to the ACOG 1996 definition. Genomic DNA was isolated and the alleles of the eNOS gene were identified by established techniques (3). Data were analyzed using  $\chi^2$  tests.

**Results** There was a significant difference in the genotype distribution between PE and control women ( $p=0.017$ ), with more homozygosity for the Asp298 polymorphism amongst PE patients.

Table: Genotype distribution

	Glu298Glu	Glu298Asp	Asp298Asp
PE (n=35)	71%	11%	17%
Control (n=279)	64%	29%	7%

**Discussion** Our data suggests that PE is associated with the Asp298Asp polymorphism of the eNOS gene. If this correlation is confirmed in a larger sample, this intriguing finding might have some implications for the pathogenesis, risk factors and/or treatment of pre-eclampsia.

- Refs:** 1. Electrophoresis 1997;18:1646-9. 2. Pharmacokinetics 1991;20:350-7. 3. Hypertension 1998;32:3-8.