Obstetrical and fetal outcomes of a new management strategy in patients with intra-hepatic cholestasis of pregnancy

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Introduction The adverse maternal, obstetrical, and fetal effects encountered in ICP are varied. A policy of early induction of labor at 36-37 weeks gestation has been adopted by many investigators to avoid risk of IUFD. However, there has been a marked debate regarding the gestational week at which IUFD occurs. On the other hand, there are some concerns whether this clinical practice itself could be the cause of increased perinatal mortality as elective delivery at that age carries the risks of prematurity including RDS. We hypothesize that allowing pregnancy to continue in ICP patients until expected date of delivery (EDD) or spontaneous onset of labor could be associated with lower risks of iatrogenic preterm labor and respiratory distress syndrome without an additional increase in risk of IUFD.

The objective of this study was to determine the incidence, obstetrical and fetal complication rates of intra-hepatic cholestasis of pregnancy (ICP) in patients managed expectantly to 40 weeks gestation.

Methods This was a prospective cohort study conducted between February 2008 and January 2010 in Qassim Region of Saudi Arabia and including a total of 21,960 pregnant women, who were screened for ICP using specific criteria for diagnosis. The course of pregnancy was monitored to 40 weeks gestation or spontaneous onset of labor, whichever came first. The measured outcomes were compared with a cross-matched group of healthy pregnant women. Continuous variables were analyzed using the t-test, while χ^2 -test was used for comparing percentages of categorical variables.

Results The incidence of ICP was 0.35% among screened patients (76 out of 21,960). There was no

significant difference between groups in gestational age at delivery, preterm labor, intrauterine fetal death, cesarean section, or respiratory distress syndrome. There were higher intrapartum non-reassuring fetal heart rate patterns and meconium stained amniotic fluid in the ICP group ($P < 0.01$, and $P < 0.0001$, respectively).

Table 1 Obstetrical and fetal outcomes in both groups

	ICP-group (n=76)	Controls (n=200)	P-value
Gestational age at delivery (mean $\pm$ SD)	36.63 $\pm$ 2.57	37.24 $\pm$ 1.9	0.21
Preterm birth:	6 (7.8)	13 (6.5)	0.68
Spontaneous preterm labor	3 (4.0)	5 (2.5)	0.29
Iatrogenic preterm labor	9 (11.8)	18 (9.0)	0.42
Intrauterine fetal death	1 (1.3)	2 (1.0)	0.82
Meconium stained amniotic fluid	18 (23.6)	5 (2.5)	0.0001
Non reassuring intrapartum CTG.	8 (10.5)	6 (3.0)	0.01
Cesarean Section:	6 (7.8)	12 (6.0)	0.65
Elective	9 (11.8)	17 (8.5)	0.31
Emergency	15 (19.7)	29 (14.5)	0.15
Postpartum hemorrhage	4 (5.2)	9 (4.5)	0.41
Neonatal outcome			
5 min-Apgar score median, range	9 (6-10)	10 (8-10)	0.37
Pediatric care unit admission	12 (15.7)	10 (4.9)	0.001
Respiratory distress syndrome	2 (2.6)	3 (1.5)	0.28

Table 2 Maternal biochemical assays and umbilical artery Doppler sonogram in both groups (mean, SD and range)

	ICP- group (N=76)	Controls (N=200)	P-value
Total bile acid (μ mol/L)	28.95 $\pm$ 3.93 [19.2- 36.3]	6.51 $\pm$ 0.8 [1.2- 9.6]	0.001
ALT (IU/L)	182.21 $\pm$ 22.49 [134 -229]	49.35 $\pm$ 18.36 [18 - 76]	0.001
Total serum bilirubin (μ mol/L)	10.5 $\pm$ 2.19 [7.4 -14.8]	4.77 $\pm$ 1.22 [2.4 -7.8]	0.05
Doppler indices			
S/D ratio	2.43 $\pm$ 0.41 [1.88-3.72]	2.40 $\pm$ 0.43 [1.58-3.78]	0.43
Pulsatility index	0.92 $\pm$ 0.16 [0.66-1.27]	0.91 $\pm$ 0.19 [0.51-1.32]	0.79

Discussion The incidence of ICP in Qassim region of Saudi Arabia is low compared to worldwide figures. The expectant management of ICP to 40 weeks is associated with comparable pregnancy course to normal women provided good fetal monitoring, and moderate rise of maternal serum bile acids. Careful intrapartum fetal monitoring is necessary to avoid more likely birth asphyxia. Large randomized clinical trials to compare both early delivery and expectant management lines are highly recommended to establish an effective management strategy to

reduce rates of adverse obstetrical and fetal outcomes.

Comparison between Mannitol 20% and hypertonic saline 7.5% for cerebral resuscitation in severely head injured patients with intra-cranial hypertension

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Introduction Elevated intracranial pressure (ICP) represents the most important cause of morbidity and mortality in patients suffering from severe traumatic head injury. Early management of the elevated intracranial pressure is advantageous in preventing secondary brain insults and improving outcome. Infusion of hyperosmolar solutes is one of the modalities currently used for management of intracranial hypertension after severe head injury. Mannitol 20% is considered as the reference solute, but it has limitations and may fail to decrease critically elevated intracranial pressure. Hypertonic saline solutions have received renewed attention in clinical practice as osmotic agent for cerebral resuscitation. It may be more beneficial than other osmotic diuretics because they augment intravascular volume and cardiovascular performance in addition to reducing intracranial tension and improving cardiovascular elastance.

This study compares the effect of 20% isovolume of mannitol with 7.5% hypertonic saline on intracranial pressure (ICP), hemodynamics and cardiac performance in patients with severe head injury and high intracranial pressure.

Methods Fifty-six patients admitted to intensive care unit fulfilling the inclusion criteria were allocated randomly into two groups. Group (A), 28 patients, received a bolus dose infusion of 2 ml/kg mannitol 20% within 10 minutes and group (B), 28 patients, received a bolus dose infusion of 2ml/kg hypertonic saline 7.5% within 10 minutes. Extradural catheter tip pressure transducer was inserted in all patients. Central venous catheter and urinary catheter were also inserted. Continuous monitoring

of ICP was done for all patients and data of first 12 hours was recorded. Measurement of hemodynamic variables (HR, BP, and CVP) and cardiac output variables (CI, SVI, and EF) were assessed through transthoracic electrical bioimpedance using BOMED NNCCOM3 cardiodynamic apparatus at different time intervals after infusion of the tested solution. Urine output and blood electrolytes were also evaluated. Number of additional doses of the tested solution was recorded.

Results Both groups were similar regarding sex, age, and GCS at admission. There was significant decrease in ICP after 30 minutes and one hour after infusion in both groups (from 21 ± 2.5 to 9 ± 2.25 and 8 ± 1 mmHg in HTS group and from 21 ± 1.8 to 8 ± 1.75 and 9 ± 1.05 mmHg in mannitol group). Furthermore, in HTS group, there was significant increase in cardiac index (CI), stroke volume index (SVI), and ejection fraction (EF). There was also mild, but insignificant, increase in mean arterial pressure and central venous pressure (CVP). Heart rate showed non-significant decrease. On the other hand, in mannitol group, there was a significant decrease in CVP, while all other cardiac and hemodynamic variables showed no significant changes.

Figure 1 Changes in Intracranial pressure (ICP) at different time intervals among study groups.

Figure 2 Changes in cardiac index (CI) at different time intervals among study groups.