

Prenatal Detection of Transposition of the Great Arteries does not reduce Mortality and Morbidity

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Background: Although neonates with transposition of the great arteries (TGA) often have an uncomplicated preoperative course followed by arterial switch operation with a low mortality risk, others become severely hypoxic and even die shortly after birth due to insufficient systemic arterial oxygenation. This retrospective study sought to review the impact of fetal diagnosis on neonatal morbidity and survival.

Methods: Included were 159 live-births with a fetal (n=80) vs. neonatal (n=79) diagnosis of TGA in Ontario from 2009-2014. Excluded were 4 fetal cases with pregnancy termination. Patients were identified from prospective databases. Collected data includes patient age at diagnosis, ICU admission and interventions, pre-operative health status, morbidity, and survival to 1-year of life. Student's t-test, chi-square test and Kaplan Meier estimates were used to compare the study cohorts.

Results: The table summarizes the main results.

	Fetal (n=80)	Neonatal (n=79)	P-values
Gestational age at birth (weeks)	39 (33-41)	39 (35-41)	0.02
Preadmission mortality	1/80 (1.2%)	-	
Age at hospital admission (hours)	1.4 (0.5-4)	10.5 (1-696)	<0.0001
Preoperative prostaglandin	79/79 (100%)	75/79 (95%)	0.12
Balloon atrioseptostomy	59/79 (75%)	68/79 (86%)	0.11
Age at PGE initiation (hours)	0.1 (0-1.7)	4.9 (0.8-643)	<0.0001
Age at atrioseptostomy (hours)	5.2 (1.3-655)	15 (3.5-645)	<0.0001
Age at surgery (days)	6 (3-68)	9 (3-62)	0.02
Length of hospital stay (days)	20 (10-175)	16 (8-99)	0.007
Mortality from admission to 1-year	1/79 (1.3%)	5/79 (6.3%)	0.21
Preoperative morbidity score	1 (0-4)	1 (0-3)	0.26
Postoperative morbidity score	0 (0-5)	0 (0-5)	0.89

Time intervals from birth to hospital admission, start of prostaglandin therapy, atrioseptostomy and surgery were significantly shorter for prenatally diagnosed livebirths. While hospital stays were significantly shorter for postnatally diagnosed cases, the cohorts were otherwise comparable, including in preoperative preductal oxygen saturation, pH, lactate, perioperative morbidity and one-year mortality rate.

Conclusions: The rate of prenatally diagnosed livebirths is about 50% in Ontario, suggesting the need of strategies to further improve detection rates. Prenatal diagnosis significantly shortened the time to neonatal tertiary care and surgery but did not improve the health status or survival of patients with TGA.