

Gómez O<sup>1</sup>, Nogué L<sup>1</sup>, Soveral I<sup>1,2</sup>, Guirado L<sup>1</sup>, Izquierdo N<sup>1</sup>, Pérez M<sup>1</sup>, Masoller N<sup>1</sup>, Escobar MC<sup>3</sup>, Sánchez de Toledo J<sup>3</sup>, Martínez JM<sup>1</sup>, Crispi F<sup>1</sup>, Bennasar M<sup>1</sup>

<sup>1</sup> BCNatal Fetal Medicine Research Center (Hospital Clínic and Hospital Sant Joan de Déu), University of Barcelona, Barcelona, Spain

<sup>2</sup> Obstetrics Department, Hospital General de Hospitalet, Hospitalet de Llobregat, Barcelona, Spain

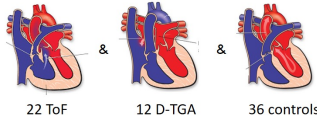
<sup>3</sup> Pediatric Cardiology Department, Sant Joan de Déu Hospital, Esplugues de Llobregat, Barcelona, Spain

## OBJECTIVES

To describe the **cord blood profile of different cardiovascular biomarkers** in a prospective series of fetuses with **tetralogy of Fallot (ToF)** and **D-transposition of great arteries (D-TGA)** and to explore their correlation with fetal echocardiography and perinatal outcome.

## METHODS

Prospective cohort study (2014-2019)

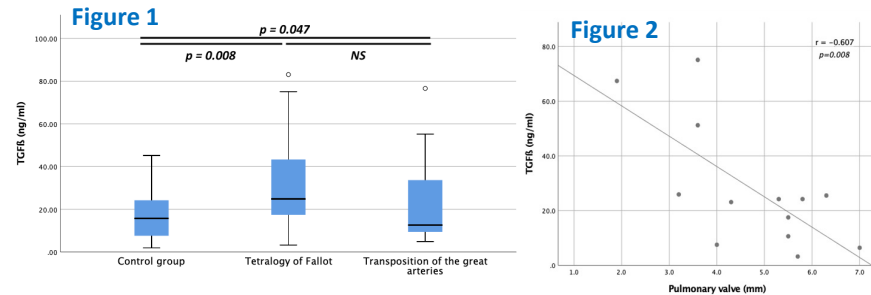


**Obstetric ultrasound and fetal comprehensive echocardiography** were performed in the third trimester and cord blood was obtained at delivery.

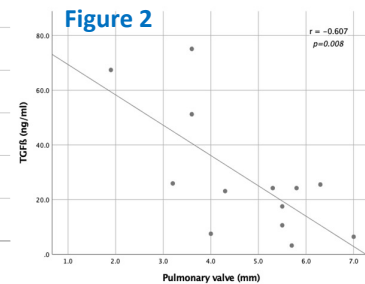
**Cord blood concentrations** of N-terminal precursor of B-type natriuretic peptide, Troponin I, transforming growth factor $\beta$  (TGF $\beta$ ), placental growth factor, and soluble fms-like tyrosine kinase-1 were determined.

## RESULTS

- A markedly increase in **cord blood TGF $\beta$**  was found in ToF fetuses (24.9 ng/mL (15.6-45.3) vs. controls 15.7 ng/mL (7.2-24.3) vs. D-TGA fetuses 12.6 ng/ml (8.7-37.9);  $p = 0.012$ ) (*Figure 1*).
- TGF $\beta$  levels showed a negative correlation with the **pulmonary valve diameter z-score** at fetal echocardiography ( $r = -0.576$ ,  $p = 0.039$ ) (*Figure 2*).
- No other differences were found in the rest of cord blood biomarkers among the study populations.



These results remained statistically significant even after adjusting for maternal body mass index, birth weight and mode of delivery.



**CONCLUSIONS:** This study newly describes increased cord blood TGF $\beta$  concentrations in ToF fetuses compared to D-TGA and controls. We also demonstrate that TGF $\beta$  levels correlate with the severity of right ventricle outflow obstruction. These novel findings open a window of research opportunities on new prognostic and potential preventive strategies in ToF fetuses.