

Background

High sensitivity troponin T (hsTnT) detects the myocardial injury and predicts poor outcomes in adults with acquired and congenital heart disease (CHD). However, few reports describe the usefulness of hsTnT in pediatric patients (pts) with CHD.

Objectives

The aim of the study was to determine whether hemodynamic load and hypoxia induce the myocardial injury and the hsTnT as a marker of myocardial injury predict the adverse events such as the cardiac arrest, death, or lethal arrhythmia in pediatric pts with CHD.

Methods

Subjects

- Patients <20 years old were analyzed hsTnT from January 2012 to March 2014.
- All pts were divided into 4 groups.
 - A: CHD with right sided heart overload (ASD, Ebstein anomaly)
 - B: CHD with left sided overload (VSD, PDA)
 - C: Cyanotic CHD (TOF)
 - D: Others (Cardiomyopathy, myocarditis, cardiac tumor)
- Controls: normal structure heart excluded pulmonary hypertension, Kawasaki disease and arrhythmia.

Methods

- We compared the levels of hsTnT in each groups.
- In A to C groups, we analysed the correlation between the levels of the hsTnT and pulmonary-systemic flow ratio (Qp/Qs), right /left ventricular pressure ratio (RVP/LVP) and SO₂.
- Prognostic accuracy was calculated from receiver operating characteristic (ROC) curve

Results

-114patients (male 54 pts) was enrolled in this study.

Table 1. Baseline characteristics of the study subject

	A (n=30)	B (n=30)	C (n=24)	D (n=22)	Control (n=8)
Age(yrs) Median(range)	3.4 (0.6-19.3)	3.1 (0.1-16.7)	1.0 (0.3-19.7)	9.9 (0.0-19.3)	3.7 (1.2-14.8)
Male (%)	10 (33.3)	11 (36.7)	15 (62.5)	13 (59.1)	5 (62.5)
BNP(pg/ml) Median(range)	18.8 (4 – 112)	17.8 (3 – 281)	20.0 (3 – 552)	37.2 (3 - 7792)	7.4 (6 – 21)

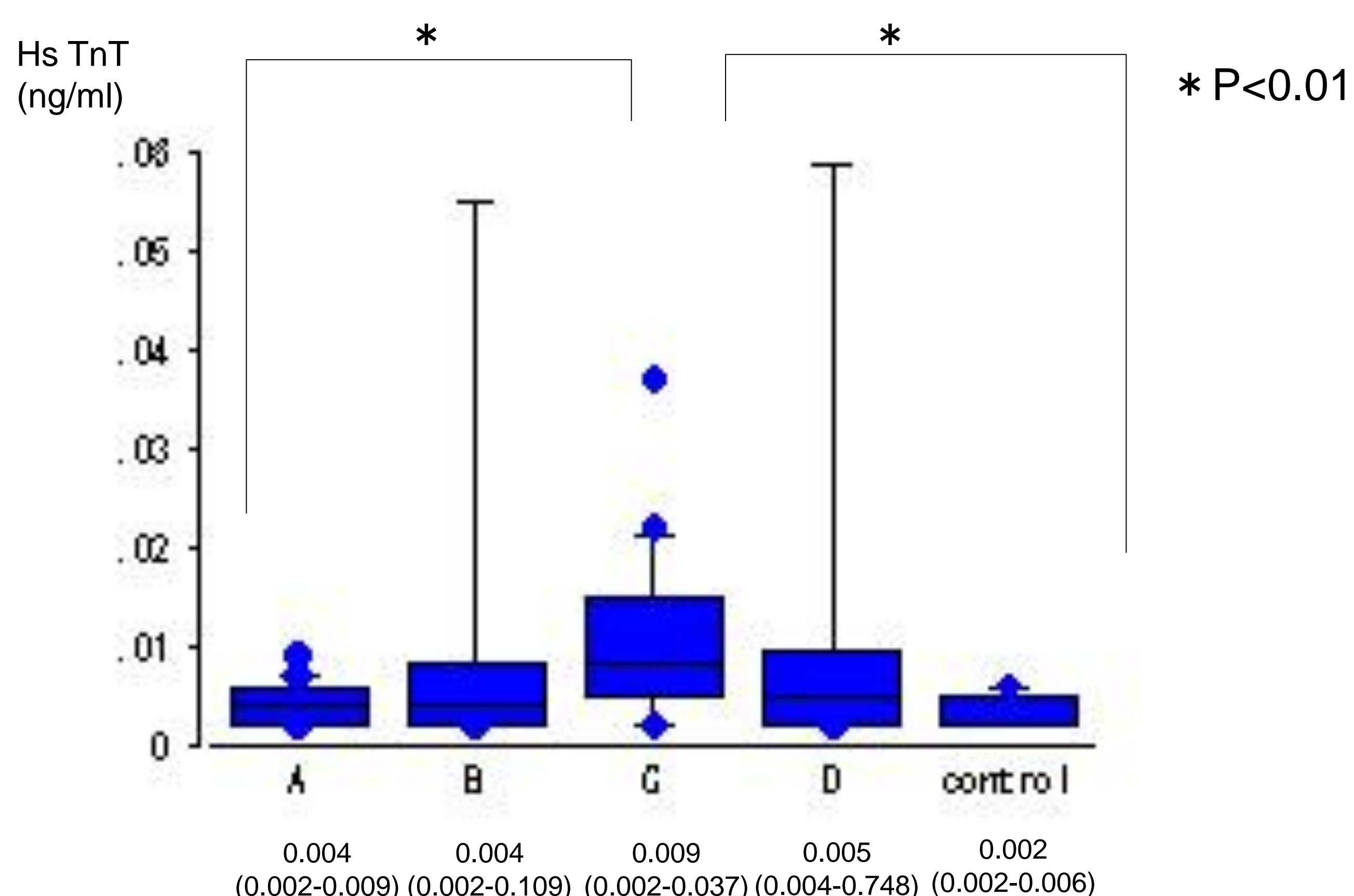


Figure 1. Comparison of the level of high sensitive troponin T

- Statistical significance was observed between A vs. C and C vs. control.

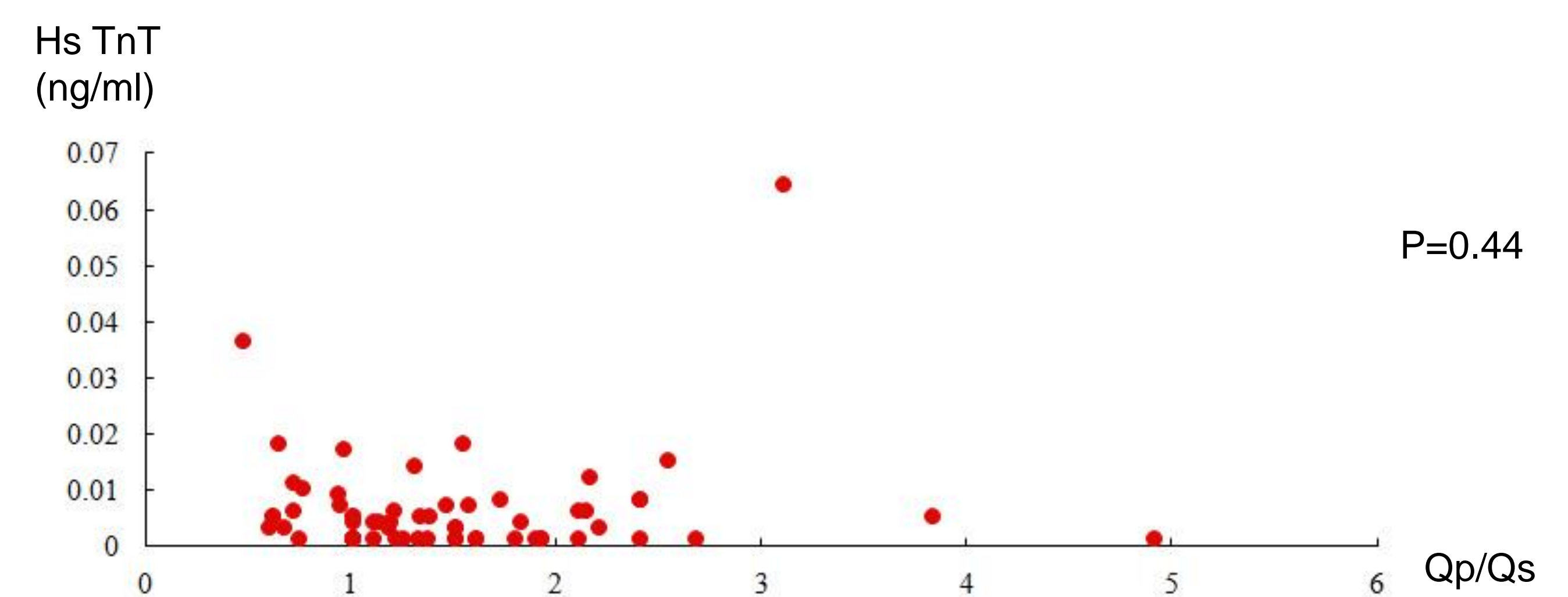


Figure 2. Relationship between Qp/Qs and hsTnT

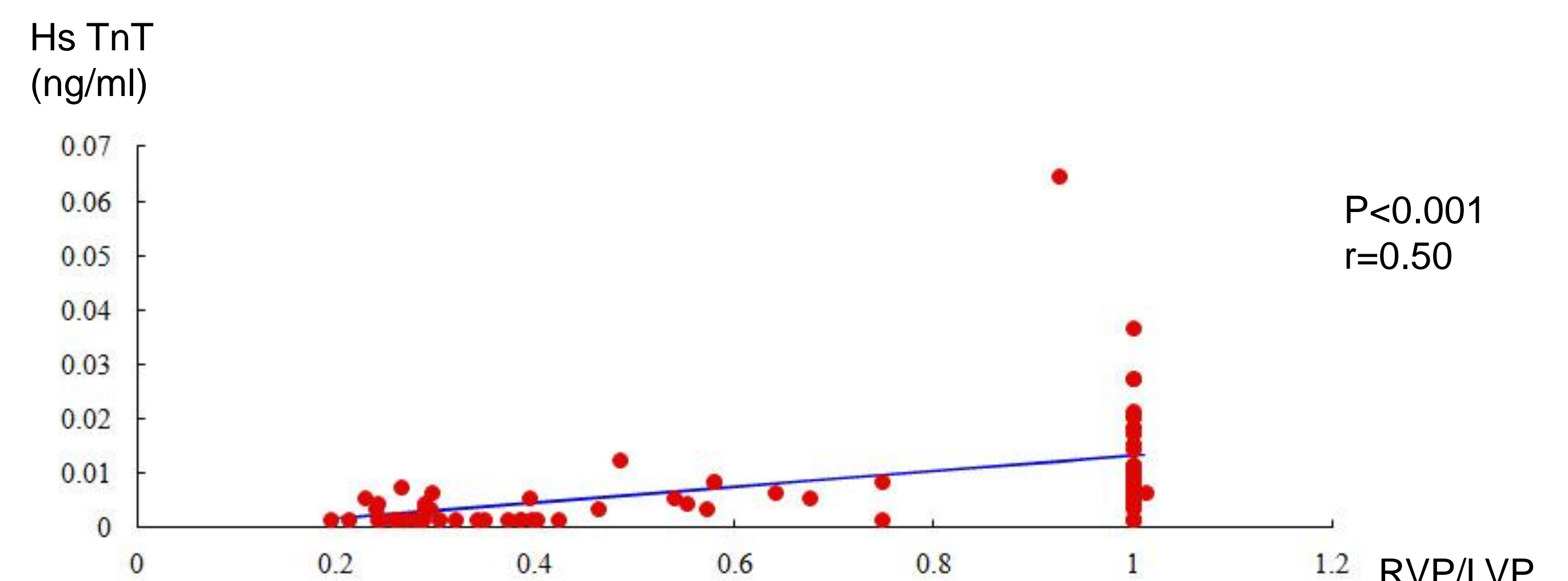


Figure 3. Relationship between RVP/LVP and hsTnT

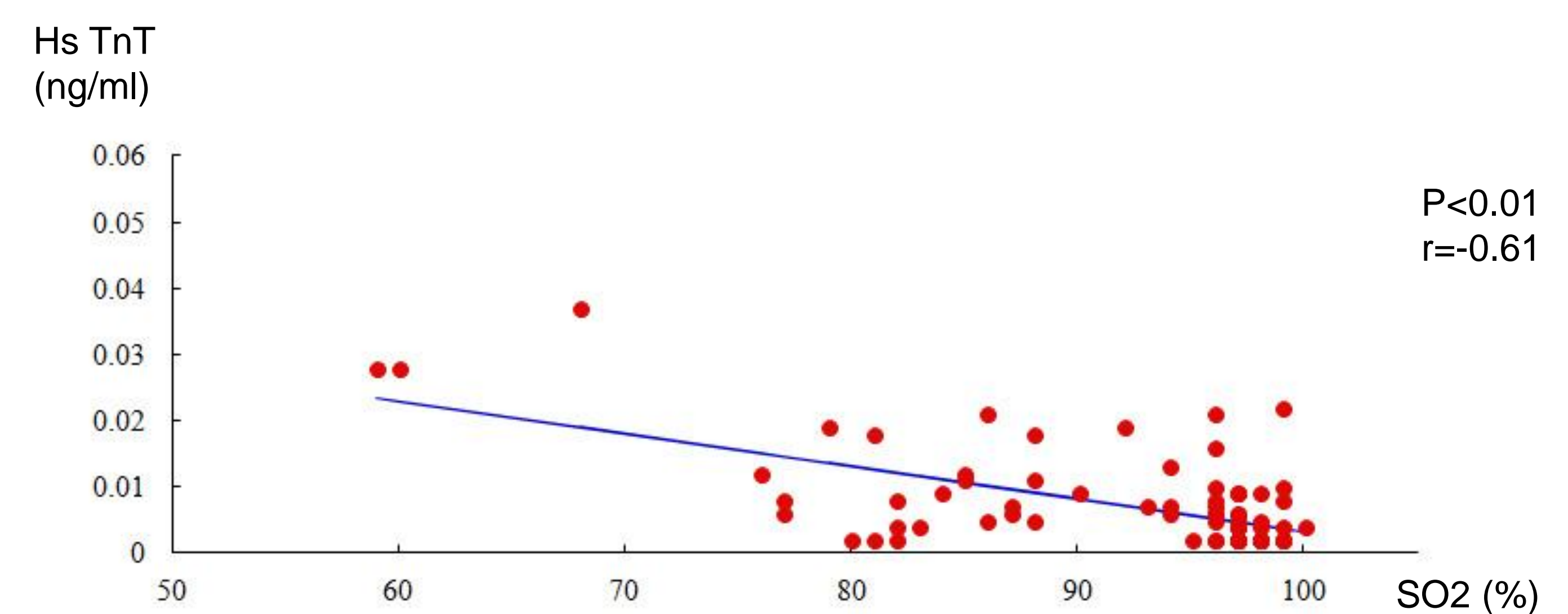


Figure 4. Relationship between SO2 and hsTnT

- There was no correlation between QP/Qs and hs TnT(Fig 2)
- The hs TnT positively correlated with RVP/LVP and negatively with SO₂ (Fig. 3, 4)

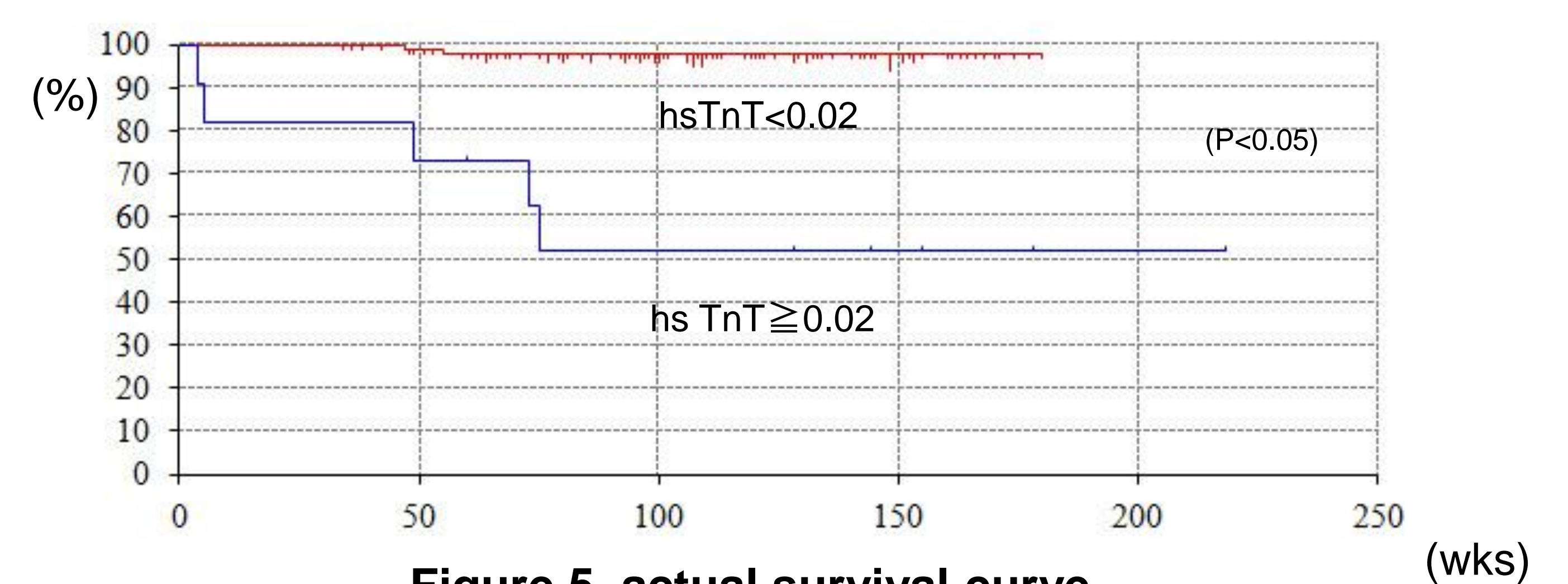


Figure 5. actual survival curve

- Survival rate was significantly lower in Hs TnT≥0.02ng/ml group compared to hs TnT<0.02ng/ml group.

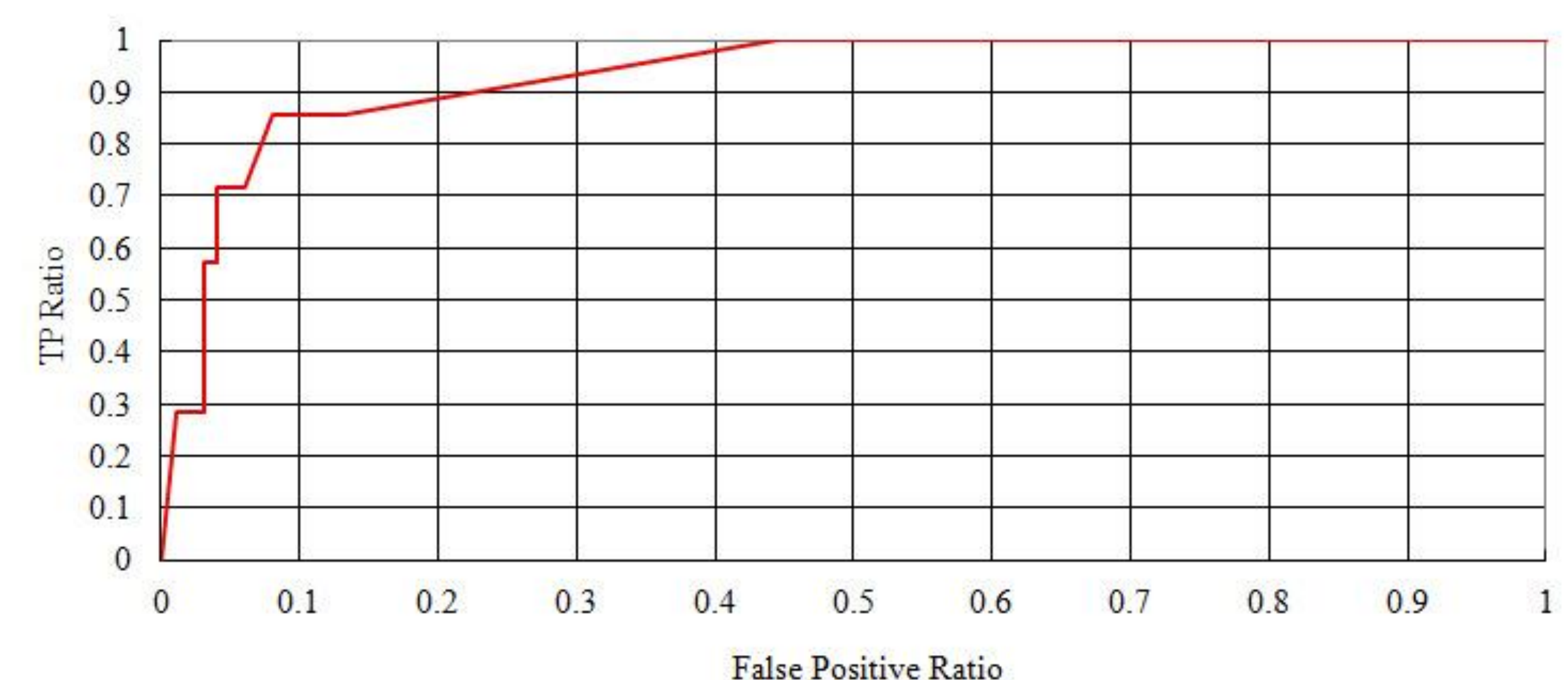


Figure 6. Receiver operating characteristic curve for death

- Seven patients died during follow up period.
- hsTnT cut off value(0.02ng/ml) : sensitivity 0.71, specificity 0.96 (Fig 5)

Conclusions

Pressure overload to right ventricle and hypoxia induce the myocardial injury. The high levels of hsTnT may predict poor outcomes in pediatric patients with CHD.