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High Sensitivity Troponin T Levels in Healthy Newborns

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Introduction: Research on cardiac biomarkers and their clinical implications has intensified significantly in the past few years. With advances in technology, a new era in troponin assays has approached. High-sensitivity troponin T (TThs) assays represent an important advance with added sensitivity for cardiac myocyte necrosis. This method detects concentrations of the same proteins that conventional assays, just in much lower concentrations. To date, there is an insufficient data regarding TThs levels in neonates. The aim of this study is to assess TThs levels in healthy newborns.

Materials and methods: Following approval by the institutional review board, consecutively 454 healthy full termed newborns were enrolled in the study. Samples of cord blood were drawn and tested for TThs concentrations with high-sensitive assay. Two hundred and thirteen samples (47%) were excluded due to blood hemolysis of various degrees. Further, the group of 241 healthy newborns (birth weight 3423g±429g) was statistically analyzed. The 97.5 percentile of TThs concentration was assessed and correlation analysis was performed.

Results: The mean concentration of TThs in healthy newborns was 42.1±16.4ng/ml, 97.5 percentile was 81.2 ng/ml (confidential interval 74.2-104.2 ng/ml). We found statistically higher TThs concentrations in boys when compared to girls (mean 44.6±18.2ng/ml; 39.4±13.6ng/ml, $p<0.05$ respectively). TThs levels in newborns after cesarean section were lower than in children delivered vaginally (mean 38.9±15.1ng/ml; 43.5±16.8ng/ml, $p<0.01$ respectively). Importantly, TThs concentrations were statistically decreased in hemolytic blood samples when compared to non-hemolytic samples (39.7±18.9 ng/ml; 42.1±16.4ng/ml, respectively $p<0.01$).

Conclusion: This study confirmed the higher TThs concentrations in healthy newborns compared to adult population. The reason for this elevation is unclear. The rise may be related to the apoptosis of myocardial cells and troponin T isoforms transformation within fetal and newborn period. TThs concentrations may be decreased in hemolytic blood samples. One should take all these facts into consideration in clinical assessment of myocardial disease in newborns.

Supported by the Research Project of the Ministry of Education CZ- No. 0021620816 and P36