Measurement of ultrasensitive Troponin T levels in cord blood for early detection of myocardial cell damage after birth

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Background.
Myocardial cell damage after neonatal asphyxia is underestimated. Indeed, its occurrence has not been systematically investigated that far.
With this respect, the possibility to detect it early after birth by measuring blood levels of markers of organ injury would allow early treatment and improvement of patient outcome.
This prospective study was designed to collect normal values and analyse levels of the new markers of tissue damage and inflammation that are the ultrasensitive (u) cardiac Troponine T (TnT) and copeptine, Brain Natriuretic Peptide (BNP) and u C-reactive Protein (CRP), respectively, in neonates.

Methods.
In 60 consecutive mature neonates (mean age: 39 gestational weeks) cord blood levels of uTnT, Copeptine, BNP and uCRP were measured.
Data were analysed with respect to mode of birth, presence of dystocia and were related to the Apgar score given at 5 and 10 minutes.

Results.
uTnT levels averaged 35+/-18 ng/L, Copeptine 483,5+/-669,9 pmol/L, BNP 706,8+/-447,6 ng/L and uCRP 0,064+/-0,11 mg/L, respectively.
There was no influence of gestational age on marker levels.
There was no difference between neonates born by vaginal delivery or by caesarean section.
In contrast, the 7 neonates born after dystocic delivery showed higher values of uTnT than neonates born after uncomplicated delivery: 44+/-22 versus 30+/-19 (p<0,1).
uTnT values correlated with the Apgar score calculated at 5 minutes (P<0,1) and with BNP values (p<0,02).
Blood concentrations of Copeptine, BNP and uCRP were not influenced by dystocia demivery.

Conclusions.
The results of this study suggest that measuring cord blood concentrations of uTnT might allow detecting neonates with myocardial cell damage due to intrapartal asphyxia.
The relationship between uTnT- and BNP levels we report here suggests that uTnT elevation is the expression of a myocardial damage that is functionally relevant.
We expect that early recognition of neonates with subclinical myocardial cell injury should lead to early protective strategies in order to improve post-natal outcome.