

CYSTATIN C - A NOVEL MARKER OF KIDNEY INJURY IN THE NEWBORNS WITH ASPHYXIA

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In clinical practice, kidney injury is detected when serum creatinine concentrations increase over a short period of time, with or without oliguria. To assess renal function in neonates is used determination of glomerular filtration rate (GFR) after creatinine. But creatinine concentration is not a decisive marker. Changes in serum creatinine may be influenced by other factors, which are not directly related to kidney damage, such as age, sex, body mass and nutritional status. Serum creatinine is a poor marker of kidney dysfunction because GFR become increased only when the kidneys have lost 50% of their functional capacity. Therefore, there are objective difficulties for a correct evaluation of renal function after serum creatinine. Serum cystatin C is recognized as the most accurate endogenous marker of GFR. Cystatin C is a 13-kd endogenous cysteine proteinase inhibitor and is produced by all nucleated cells. Cystatin C is freely filtered by the glomerulus, reabsorbed, and catabolized, but not secreted by the tubules. Cystatin C, determined in serum, is an endogenous marker of kidney function, detected earlier than creatinine. Serum cystatin C concentrations are independent of age, sex, race, and body mass and hydration level. Serum concentrations of cystatin C may be used to detect renal dysfunction in critically ill patients with kidney injury 24–48 h earlier than creatinine measurements

The purpose of the work is to study the diagnostic value of determination of cystatin C in serum in full-term infants with disturbance of kidney function due to severe asphyxia.

Materials and methods. The study involved 15 children with kidney injury due to severe asphyxia. Comparison group consisted of 10 infants without asphyxia at birth. The cystatin C level in serum was determined on 1-2, 7-8 and 25-30 days of life by ELISA. GFR calculated after cystatin C using A. Grubb formula.

Results. The absolute GFR values in healthy infants are low and within 1 month of life levels do not exceed 35-46 ml/min. These GFR levels are physiological and don't represent a violation of the filtration function in contrast with older children and adults. In children with renal disturbance due to severe asphyxia are noted statistical decreases in GFR at 1-2 days of life. At the end of the early neonatal period were marked the lowest levels of GFR. These levels were twice lower than in healthy newborns. Further, GFR recovered to level at birth, but its index still remained rather low ($p < 0,05$) relatively healthy newborns.

Conclusion. Cystatin C is early and sensitive indicator of renal dysfunction because its content in serum significantly increased already at 1-2 days after birth. During the neonatal period, GFR, calculated by cystatin C, characterizes the filtration value in infants with kidney disturbance due to asphyxia.