REFERENCE RANGES OF URINARY LEVELS OF KIM-1 AND IL-18 IN TERM AND PRETERM NEWBORNS IN THEIR FIRST 48 HRS OF LIFE

¹Anna Tarko, ¹Anna Suchojad, ²Anna Jarosz-Lesz, ³Barbara Przybył, ¹Iwona Maruniak-Chudek
¹Intensive Care and Neonatal Pathology Unit, Faculty of Medicine in Katowice, Medical University of Silesia, Katowice, Poland; ² Neonatology Unit, Guardian Angels Hospital of the Brothers Hospitallers of St. John of God in Katowice, Poland; ³ Clinical Unit of Neonatology and Intensive Care, Multidisciplinary Hospital E. Warmiński, Bydgoszcz, Poland

BACKGROUND AND AIMS

KIM-1 and IL-18 measured in urine have been described as potential markers of acute kidney injury, but their role as inflammatory indicators were also raised. Their values were seldom measured in healthy population to establish reference values.

METHODS

We evaluated both substances in urine samples collected from 80 healthy term newborns and 70 preterm infants on their first 48 hours of life. All the patients were managed routinely and did not underwent any intensive medical interventions.

RESULTS

Mean gestational age (GA) and birth weight (BW) were: 39 wks (range: 37-41), 3414 grams (range: 3324-3502) and 34 wks (range: 31-36), 2229 grams (range: 2089-2369), in term and preterm newborns, respectively. In term newborns, 10th and 90th centiles of KIM-1 values were 0.21 and 2.27 ng/ml (median 0.66), and for IL-18: 5.4 and 81.5 pg/ml (median 20.2), respectively. In preterm newborns, median values of KIM-1 was 0.45 ng/ml (10th-90th centile: 0.09 and 2.30), while for IL-18: 62 pg/ml (10th-90th centile: 31.3 and 569). In the whole study populations KIM-1 correlated with GA ($R=0.170$, $p=0.04$) and BW ($R=0.202$, $p=0.01$), while IL-18 correlated with GA ($R=-0.493$, $p<0.001$), BW ($R=-0.436$, $p<0.001$) and Apgar 5' ($R=-0.358$, $p<0.001$). They both were not influenced by stress factors noted during pregnancy or at delivery. Nasal CPAP introduced to the preterm newborns also did not affect KIM-1 or IL-18 concentrations.

CONCLUSIONS

Term, healthy newborns presented slightly higher values of KIM-1 and lower IL-18 in comparison to preterm newborns, born in good clinical condition, with no or only mild respiratory insufficiency. Values of studied markers were quite stable in both populations and were influenced by basic demographic, but not by clinical parameters.

Scientific Grant of Medical University of Silesia
No: KNW-2-017/N/5/0, KNW-1-127/N/5/0

Table 1. Demographic factors and clinical parameters of the study population, presented separately for term and preterm newborn. * - median

	PRETERM [N=70]	TERM [N=80]	Statistical significance
Gender (M/F)	42/28	48/32	P=0.87
Gestational age (wks)*	34 [33-36]	39 [38-40]	P<0.001
Birth weight (g)	2229 [2089-2369]	3414 [3324-3502]	P<0.001
Apgar 5' (pts)*	9 [8-10]	10 [10-10]	P<0.001
KIM-1 (ng/ml)*	0.45 [0.19-0.98]	0.66 [0.33-1.07]	P=0.36
IL-18 (pg/ml)*	62 [41-114]	20 [11-36]	P<0.001
Stress factors in pregnancy (Y/N)	30/40	9/71	P<0.001
Stress factors during delivery (Y/N)	29/41	6/74	P<0.001
nCPAP (Y/N)	38/32	0/80	P<0.001

Fig. 1 Comparison of IL-18 values between term and preterm newborns

Fig. 2 Correlation between IL-18 concentration and birth weight