Combination of Excessive Weight Gain and Interleukin-8: A Possible Predictor of Necrotising Enterocolitis in Neonates?

F. Neunhoeffer¹, H. Jansen², R. Goelz², H. Renk¹, C. Poets², G. Seitz³, A. Wacker², T. Orlikowsky⁴

¹Department of Paediatric Cardiology, Pulmology and Paediatric Intensive Care Medicine, University Children’s Hospital Tübingen, Germany
²Department of Neonatology, University Children’s Hospital Tübingen, Germany
³Department of Paediatric Surgery, University Children’s Hospital Tübingen, Germany
⁴Department of Neonatology, University Hospital Aachen, Germany

Background: Early diagnosis of necrotising enterocolitis (NEC) is difficult. Serum interleukin-8 (IL-8) is a sensitive and early infection parameter in preterm and term neonates. Weight gain of more than 5% one day before the clinical diagnosis of NEC is described as a predictive factor. Hypothesis: Weight gain of more than 5% one day prior to clinical suspicion plus increase of plasma interleukin-8 (IL-8) are predictive for NEC.

Methods: 48 infants with diagnosis of NEC stage II and III were enrolled in a case-control study. Oral and parenteral nutrition, diuresis and kinetics of weight and of IL-8 were documented daily. Stage of NEC was defined according to Bell criteria. We analysed three different groups: a control group (matched by gestational age, weight and age), group NEC stage II and NEC stage III.

Results: 31 infants with NEC stage II and 17 infants with NEC stage III were enrolled. All 31 children with NEC stage II were treated conservatively. All 17 children with NEC stage III were treated surgically, one child died. A control group of 48 matches regarding gestational age, age and birth weight was selected. Weight gain > 5% occurred in 35.3% of NEC stage III, in 0% of NEC stage II and in 4.2% of the control group. Median weight gain in NEC-III was +4.2% (−5.2±21.2%), in NEC-II +0.1% (−5.8±4.1%), in the control group 0.6% (0±8.3%), respectively (Fig. 1). The total daily fluid intake in the two stages of NEC was similar throughout the observation period. IL-8 increased significantly [NEC stage III (6561.4 pg/mL) vs NEC stage II: (326.7 pg/mL) vs control group (38.9 pg/mL); p < 0.05] (Fig. 2). CRP in NEC patients increased 12–24h later. Sensitivity of IL-8 in NEC stage II was 87.10% (70.15–96.25) and in NEC stage III 100.00% (80.33–100.00). Sensitivity of weight gain was 0.00% (0.00–11.32) in NEC stage II and 35.29% (14.30–61.65) in NEC stage III.

Conclusion: There was no significant difference in weight gain between the NEC groups and the control group, even if some individual children showed a considerable weight gain. Weight gain > 5% was found in only 35.3% of the cases with NEC stage III. Thus our data cannot confirm weight gain as a suitable diagnostic criterion for NEC. Combination of weight gain and IL-8 did not improve diagnosis of NEC.

Fig. 1 Weight gain (g) per day (d). Mean and SD are given.

Fig. 2 Serum IL-8-concentrations at time of suspicion of NEC (day 0) (*p < 0.05).