**Background and aims** Transcutaneous bilirubinometry (TcB) is a quick and painless method to guide the management of neonatal jaundice. Few studies have conducted on the effectiveness of TcB in preterm infants under phototherapy. The aim of the present study to examine the accuracy of TcB measurements during and after phototherapy in preterm infants.

**Methods** A prospective cohort study performed in the Coombe Women and Infants University Hospital, Dublin, Ireland. Preterm infants (23 +0 to 36 +6 weeks of gestation) born between June 2017 and May 2018, were enrolled in the study if they developed significant jaundice requiring phototherapy. TcB was measured from exposed (TcBu) and covered (TcBc) areas within an hour of obtaining total serum bilirubin (TsB) samples. Correlation between TcB (TcBu and TcBc) and TsB were examined during and after phototherapy.

**Result** This study consisted of 196 jaundiced preterm infants (mean birth weight(±SD) 1605 g(±638), mean gestational age (±SD) 30.4(±3.2) weeks of gestation). We obtained 327 simultaneous measurements during the phototherapy phase and 137 pairs of readings after the discontinuation of phototherapy. There were weak correlations between TsB and TcB during phototherapy (±SD) 30.4(±3.2) weeks of gestation). We obtained 327 simultaneous measurements during the phototherapy phase and 137 pairs of readings after the discontinuation of phototherapy. There were weak correlations between TsB and TcB during phototherapy (r: 0.33, P <0.0001 in covered, r: 0.39, P<0.0001 in uncovered areas). However, post-phototherapy measurements showed a strong correlation between TsB and TcB (r: 0.86, P <0.0001).

**Conclusion** Measurement of TcB using a bed-type device is a reliable method to estimate bilirubin level in preterm infants after discontinuation of phototheray. It cannot, however, be used as a substitute for TsB measurement during phototherapy in preterm infants.

**Results** The median mass and length at birth in children of group 1 corresponded to 650.0 [610.0; 932.0] g and 34.0 [31.0; 36.0] cm, 2 groups - 1090.0 [866.0; 1393.0] g (p <0.01) and 36.0 [33.0; 40.5] cm (p <0.05). The course of the neonatal period in extremely and low premature infants is characterized by postnatal adaptation disorders. In the case of SGA, the differences relate to the frequency of intrapartum asphyxia (group 1 – 88.9%, group 2 – 58.3%, p <0.05), acute adrenal insufficiency (44.4% and 16.6%, p <0.05), pathological hyperbilirubinemia (38.9% and 8.3%, p <0.05), edema (33.3% and 8.3%, p <0.05). All patients had patholog- ical hyperbilirubinemia (38.9% and 8.3%, p <0.05), edema (33.3% and 8.3%, p <0.05). All patients had pathology of the neonatal period. In SGA were more often recorded intraventricular hemorrhages with the formation of occlusal hydrocephalus (group 1 – 33.3%, group 2 – 8.3%, p <0.05), sepsis (33.3% and 4.2%, p <0.05), congenital pneumonia (72.2% and 33.3%, p <0.05) and bronchopulmonary dysplasia (50.0% and 16.7%, p <0.05). However, in patients with SGA, the disease was more severe: intensive therapy was needed in 18 patients of group 1 and 24 in group 2. The duration of intensive therapy in preterm patients with SGA was significantly higher than in group 2: 28.0 [14.5; 37.5] and 8.0 [6.0; 10.7] days (p <0.01). By the corrected age of 1 month, the indicators of mass and length of the body in the very premature with SGA remained unsatisfactory: 3,380.0 [2,773.0; 3627.0] g (-2.3 SD) and 50.0 [44.0; 52.5] cm (-1.9 SD).

**Conclusion** Prematurity and SGA have an adverse potentiating effect on the course of the neonatal period.