Effectiveness and costs of very preterm birth in Estonia

Summary

Objectives: To evaluate the health outcomes and treatment costs of very preterm infants (VPI; born at 22–31 weeks) over time in Estonia and in comparison with published scientific literature. The secondary objective of this study was to identify the determinants of the use of health care services by VPIs during the first two years of life.

Methods: The study population consisted of all VPIs who were born alive in 2002–2003 (n = 206), 2007–2008 (n = 304) and 2011–2012 (n = 140) and survived until discharge. A control group of 153 full term-born healthy infants in 2007–2008 was matched to the 2007 cohort of VPIs. The infants' characteristics and health status were derived from the registers of previous population-based studies and linked with data regarding health service use from the Estonian Health Insurance Fund.

The length of the first hospital stay was modelled using negative binomial regression and the probability of rehospitalisation with logistic regression. Covariates included cohort, sex, gestational age, Apgar score at five minutes, place of birth, antenatal steroids, birth weight <10th percentile, length of previous hospitalisations and major morbidities during the first hospital stay: intraventricular haemorrhage, cystic periventricular leukomalacia, necrotising enterocolitis, bronchopulmonary dysplasia, retinopathy of prematurity and late-onset sepsis.

Results: In Estonia, the survival of VPIs from live births increased from 78% to 92% on hospital discharge between 2002 and 2012. The average length of the first hospital stay for survivors did not increase in Estonia (64.6, 63.2 and 59.7 days, respectively). The probability of rehospitalisation during the first year of life decreased significantly between cohorts (66%, 54% and 40%) whereas rehospitalisation remained unchanged during the second year of life. The risk factors for rehospitalisation during the first two years of life were male sex and morbidities during the first hospital stay. At the age of two years 64% of VPIs were healthy, i.e. did not present any health impairments or disabilities.

The first hospital stay of VPIs accounted for 90% of the total health care costs of VPIs during the first two years of life. The total health care costs of VPIs remained at the same level over the study period. In the first two years of life of VPIs, the cost per quality-adjusted life-year was in the range of 11,000–14,000 euros, while the cost was three times higher among VPIs with morbidities than among VPIs without morbidities.

Conclusions: The survival of VPIs in Estonia improved considerably over the study period (2002–2012), as did their health status. The total health care costs of VPIs did not increase over time. The major morbidities during the first hospital stay are the main determinants of the health care costs of VPIs. There are opportunities for a further reduction in the incidence of major morbidities through the careful planning of perinatal services in Estonia.