

## Editorial



# Two Year's Long-term Outcomes of Very Low Birth Weight Infants in Korea

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Recently, Korea confronts the serious national problem of low reproduction rate, which was 1.052 in 2017,<sup>1</sup> almost lowest in the world along with very low number of 357,700 as annual live births that correspond to half of the number compared to those in approximately 20 years ago.<sup>2</sup> Furthermore, the rate of preterm or low birth weight infants among total births has been significantly increased due to current increases in child-bearing maternal age and resultantly increased infertility rate with more use of the artificial techniques for pregnancy. However, the recent development of neonatal intensive care for high-risk newborn infants including premature infants markedly improved their survival rate.<sup>3</sup>

Generally, the major outcomes of neonatal intensive care have been presented as survival rate and long-term neurodevelopmental impairment. Traditionally, two-year follow-up data, including assessments in the motor, cognitive, and neurosensory parameters, have been considered “long-term outcomes” for neonatal research.<sup>4</sup> This long-term neurodevelopmental outcomes in survivors of premature infants have to be investigated for public health decision and for study initiatives planned to improve their outcomes.

On the other hand, the outcomes of very low birth weight infants (VLBWIs) are considered as a quality index of neonatal intensive care,<sup>5</sup> because VLBWIs are very premature infants born with a birth weight below 1.5 kg and their mortality and morbidities comprise major portion among those of total high-risk newborn infants admitted to neonatal intensive care unit (NICU). Thus, the Korean Neonatal Network (KNN), a national registry for VLBWI was started from 2013 by the Korean Society of Neonatology with the support from the Korea Centers for Disease Control and Prevention to provide population-based data for these high-risk infants and an infrastructure to improve the quality of neonatal care in Korea.<sup>3</sup> Through KNN, in Korean VLBWIs, data for short-term outcome at discharge from NICU and long-term outcome at 18–24 months of corrected age as well as at 3 years of ages have been accumulated, which enable us to investigate population-based studies for their mortality, morbidities, and long-term neurodevelopmental outcomes and to start to actively publish them nationally and internationally.<sup>3</sup> A recent report using KNN data has shown that the survival rate of Korean VLBWIs approaches about 86% which nearly similar to other developed countries.<sup>6</sup> However, population based long-term outcome of Korean VLBWIs has not been published before.

In this issue, Youn et al.<sup>7</sup> reported long-term outcomes at the corrected age between 18 and 24 months of Korean VLBWIs. This is the first national report regarding long-term physical and neurodevelopmental outcomes of population-based prospective cohorts of Korean VLBWIs. The data were collected from 2,660 VLBWIs born between January 2013 and December 2014 through KNN. The mean follow-up of 18 months after discharge was 59%–77%, and cerebral palsy was reported as 6.4%–6.7% in total and 9.1%–10.2% in survivors, with a bilateral blindness of 0.2%–0.3% and hearing the loss of 0.8%–1.9%. The developmental delay was reported 14%–25% using the Bayley Scales of Infant Developmental Outcomes version (BSID) version II, 3%–8% of infants using BSID version III. “Requiring further evaluation” was reported as 5%–12% using the evaluation for the Korean Developmental Screening Test for Infants & Children (KDST). This report can make us currently overview the real long-term neurodevelopmental outcomes of Korean VLBWIs and compare them with those of other countries at a glance, which would further facilitate making an effort to improve their ultimate long-term outcomes in various ways by providing the metrics for quality improvement or public health initiatives as well as designing the neonatal clinical trials. However, there are some limitations on neurodevelopmental assessment in this study. Due to the nature of data collection from various institutions through the nation, the standardized cognitive and psychomotor assessments were not uniform. In this report, neurodevelopmental assessments have been done using BSID II or III, or KDST with a mixed rate. The follow-up rate for BSID II was low as 23.7% and for BSID III, as 7.4%. For the KDST, only 30.4% of included cohorts were available.

Because neurodevelopmental outcomes have become increasingly important as even the most extremely preterm infants are significantly surviving more and more. Comprehensive follow-up program after NICU discharge for them including physical, neurodevelopmental, and mental well-being has to be established throughout the nation uniformly. Further investigations would be required to investigate longer follow-up outcomes into childhood as well as adults that could be incorporated into quality improvement activity and ultimate health care policies for these tiny high-risk newborns, who are important members for certain families and further, of our society, and ultimately, of our nation having the problem of extremely low reproduction rate.

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