Neonatology Today – Reflection on the Past and Future

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History helps to understand the future. Nordic countries – Sweden, Denmark, Norway, Finland, Estonia, Latvia, Lithuania - have smaller total populations than California, and they currently form a somewhat heterogeneous group of independent nations. As an example of development, in the late 19th century, Finland had no hospital beds for newborns, and infant mortality was nearly two orders of magnitude higher than today. In 1910 Finnish physician Arvo Ylppö led the first neonatal care unit for the premature, established in Berlin (1). Premature newborns were fed with fresh breast milk instead of fasting. This practice remained controversial for a very long time. During the next tumultuous decades, progress in neonatal medicine was slow.

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The rapid development of modern neonatology started in the 1960s. In 1963, premature Patrick Kennedy, born at 34.5 wk, died of RDS. This sad event elevated RDS as a medical challenge. Progress in neonatal-perinatal medicine was made by, among others, Louis Gluck, Abraham Rudolph, Kurt Benirschke, and Edward Hon in California and by Roberto Caldeyro-Barcia (Uruguay), Peter Karlberg (Sweden), Graham Liggins (New Zealand). They broadened the early findings on lung surfactant by John Clements and Mary-Ellen Avery. Next-generation investigators managed to accomplish satisfactory treatment and prevention of RDS by the end 1980s, i.e., about 20 years later than the US-Astronauts landing on the moon in 1969. Great success is nearly always followed by slower progress as the focus of public support shifts.

Pharmacologic support for medicines in children started to advance after 2002 when new legislation encouraged pediatric drug studies (2). This policy is beneficial, particularly for diseases in adolescents and older children. Regardless, neonatology maintained academic activities in the 2000s, and modern neonatal practices started to benefit transitional economies. However, great medical investments have mainly benefited adults and the elderly. The progress in the prevention of both premature births and poor intrauterine growth has been slow and antenatal research has focused on infertility (3). The blastocyst and its precursors undergo 'therapies,' whereas, after the development of the embryo, any drug trials are rare; previous spectacular adverse effects are still in mind. However, intrauterine tissues and newborn undergo investigations, using sophisticated visualization techniques, genomics, and other non-invasive 'omics' methods. Progress in identification of the risk of premature birth has been made (4). An increase in research support, seamless interaction between fertility and antenatal prevention projects, and merging of neonatal-perinatal diagnostics/intervention programs are required for a breakthrough.

Some feel that the intact survival of more and more immature infants is the future goal. Others argue that prolonging the extremely short gestations and decreasing IUGR are the challenges (4,5). These aims are not exclusive. The long-term outcome of preterm infants, regardless of the length of pregnancy, has started to improve gradually. However, the burden of prematurity for families and society continues to be high.

How do we advance our unique field? Continuous education and quality improvements are admirable goals. Networking, participation in data collection, and trials advance the field. Some institutes maintain anonymous, voluntary medical data banks on pregnancies, newborns, children, and adults. This may enable sophisticated analyses of population-wide clinical and '-omics' data (6). Anonymity and voluntary participation are key issues that must be maintained. We may anticipate new discoveries, like the expansion of less-invasive management practices and new targeted biological drugs for high-risk pregnancies and immature infants. We encourage our talented young colleagues to proceed with research that eventually may revolutionize neonatal-perinatal medicine.

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