Shades of Gray: Exploring the Limits of Neonatal Viability

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Introduction

In its recent past, the field of neonatology has made great strides in the advancement of neonatal care and preservation of life. Use of surfactant, administration of maternal steroids, and improvements in neonatal ventilation have led to the survival of infants at the limits of viability4. Despite immense advances, however, ambiguity persists regarding intervention on behalf of infants at lower gestational ages. While there is general agreement for the resuscitation of infants at 23 completed weeks, the youngest gestational age that most providers are willing to attempt resuscitation on, and 25 completed weeks, the youngest age that most consider should always be resuscitated1, variability exists between countries4,6 and, within the United States, between regions, states, and hospitals1 regarding the best course of action for these infants. The “gray area,” definition extends to encompass fetuses at 22 completed week and commonly extends to 24-25 weeks2,3,4,5. Factors in addition to gestational age that influence outcomes for extremely premature infants should be evaluated and included in prenatal conversations to provide more complete information while gaining more guidance. Uncertainty within this patient stratum represents an area that needs further definition to ensure the continued advancement of neonatology and appropriate provision of care.

Legislation and Regulation

Legislation addressing those born within the “gray area” is conflicting, complicating, and unclear. Within the United States, viability has historically been tied to statutes regarding elective termination of pregnancy1. With Roe v Wade in 1973, the United States Supreme Court developed a trimester structure which allowed elective abortions after the second trimester only if the life or health of the mother was in jeopardy, implying that a fetus became viable at this time1. Nearly 20 years later in 1992, the case of Planned Parenthood of Southern Pennsylvania v Casey abandoned the trimester system previously used noting that “whenever viability may occur, be it at 23–24 weeks, the standard at the time, or earlier, as may be the standard sometime in the future, the attainment of viability serves as the critical fact in abortion legislature3.” According to this ruling, advancements in medical technology proved that a fetus could be considered viable at 22 or 23 weeks rather than at the 28 weeks previously understood by the Court in Roe v Wade. In addition, the 2002 Born Alive Infants Protection Act (BAIPA), defines born alive “as the complete expulsion of an infant at any stage of development that has a heartbeat, pulsation of the umbilical cord, breath, or voluntary muscle movement, no matter if the umbilical cord has been cut or if the expulsion of the infant was natural, induced labor, cesarean section, or induced abortion3.” According to the Born Alive Act, infant who are breathing or have a heartbeat at birth are living. Moreover, hospital based policies and protocols differ from hospital to hospital and from state to state1. Many clinicians feel pressure to resuscitate simply based on national and state legislation and hospital policies1. Unclear legislation places the neonatologist in an uncertain position regarding whether to attempt resuscitation. This further proves the need for better definition of the “gray area” and appropriate interventions as legislation provides no clear direction.

Ethical Implications

Applying the core ethical principles to neonatal resuscitation at the limits of viability provides no additional guidance and in fact, serves to further complicate the issue. Of the moral doctrines of autonomy, beneficence, nonmaleficence and justice, autonomy of the fetus may represent the most difficult principles to define. The newborn is incapable of making self-determined decisions and therefore requires the use of a surrogate, generally a parent4. In this role, parents are expected to make decisions in the best interest of their child; information to make these decisions is supplied by perinatologists and neonatologists. Herein lies the problem. Numerous clinicians use the morbidity and mortality rates for very low birth weight (VLBW) published by the National Institute of Child Health and Human Development (NICHD) Neonatal Research Network published in 20102. This retrospective data was collected and analyzed for 9575 infants born between 22 and 28 weeks of gestation and results survival rates of those infants2. Use of this data for prenatal counseling is inappropriate as these data were not intended for this purpose. In fact, the NICHD website states that “these data are not intended to be predictive of individual infant outcomes. Instead, the data provide a range of possible outcomes based on specific characteristics2.” Information used to make decisions for periviable infants by parents, therefore, is inadequate and is potentially inconsistent with their individual circumstances. In addition to parental morality concerns, the clinician must also adhere to moral standards of care. The perinatologist is obliged to provide beneficence and nonmaleficence to the fetal patient4,5. A balance between these principles and the autonomy of the infant, as dictated by the parents, is tenuous and difficult to achieve5 providing more evidence that additional tools need to be utilized to assist in making difficult decisions.

Proposed Solution

When addressing resuscitation and the limits of viability, the NICHD Neonatal Research Network found that gender, receipt of antenatal corticosteroids, birth weight, and single or multiple birth better predicted the likelihood of a favorable outcome than gestational age alone2. Based on their work, an online calculator was developed to estimate an extremely premature infant's chances of survival, as well as survival without neurodevelopmental impairment. This tool represents the way by which improvements can be made in making decisions in the “gray zone.” The algorithm allows neonatologists to enter five clinical factors and receive immediately a calculation regarding the likelihood of survival and survival without profound or moderate disability5. This information can then be presented to parents during a prenatal consultation prior to delivery to assist in determining the appropriate course of action. While sole reliance on this algorithm would be rash, its use to guide decision making is advantageous for both clinician and family as it offers data relevant to each individual case.

Opposition

It could be argued that the use of this algorithm is too specific to be applied to all cases. Additionally, there are instances in which a woman presents in labor and there is not time for a prenatal consultation, Moreover, the use of this algorithm is inconsistent among neonatologists and therefore little research exists regarding its effect on neonatal outcomes. It is acknowledged that these challenges exist. Resuscitation for fetuses born precipitously will continue to be done on a case-by-case basis, most often using clinical picture in the delivery room to guide care1. Further research is warranted into the effect of its use on neonatal outcomes. Nevertheless, the addition of additional factors in determining course of action at delivery is beneficial.

Conclusion

As the field of neonatology continues to grow and evolve, ethical, legal, and social barriers continue persist. The addition of an additional resource for determining course of action is both reasonable and prudent. Conflicting legislation and ethical concerns each add to the complexity of the “gray area.” Using research based tools such as the NICHD algorithm it is possible to better predict patient outcomes and therefore make more informed decisions regarding resuscitation at birth.

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