Viability is one of the key aspects in perinatology, due to its philosophical, ethical and practical implications. It represents, from a practical standpoint the paradigm of continuity of maternal-fetal and neonatal care, the uncertainty of life and its quality and the experiences and feeling’s exposure involving the practice of medicine.

What’s viability?

In a vital perspective (life for life) it means the “ability to maintain a separated existence” (Oxford Universal Dictionary).

In a more humanistic perspective (life should have quality), thus is the ability to simultaneously live, grow and normally develop (Dunn P, The Lancet 1988)

In Perinatology, having in mind the boundaries of these two perspectives, viability is the potential to survive (L Blackmon – Neo reviews 2003).

If we relate viability with the gestational age (GA) we find that before 22 weeks survival is occasional and very consistently after 27 weeks’ gestation, thus considering the period borderline viability from 23+0 to 26+6 weeks of gestation. Frequency: 2 live births/ 1000 deliveries. (Rennie J Arch Dis Child, 1996)

For viability’s definition we need to characterize two more variables: time and space.

Time

Lefebvre F, et al (Am J Obst Gynecol 1996) statistically stated that there was no viability at 24 weeks in 1987-88. Nevertheless, four years later, in 1991-92, according to the same study, 40% of the 24th week’s newborn already survived. It can lead us to conclude that viability will tend to increase in time due to scientific development, until it achieves an irreducible maximum.

Place

Analyzing data from 2 countries (UK 1991-93 and USA 1991-92) with different realities and perspectives relating to borderline viability we found that at 23t weeks there is no viability in UK (Bohin S, et al- Arch Dis Child 1996), while in USA (Fanaroff A, et al – Am J Obstet Gynecol, 1995) viability is about 20%. In more advanced gestational ages these difference progressively diminish. The conclusion is that what is considered viable in one context can become not viable in other place, depending on the procedures, resources availability and the medical knowledge.

Access in Portuguese version:
Retaking the definition of viability from a perinatal point of view (“the survival potential”) we can distinguish two different concepts: possibility and probability of the fetus or newborn’s survival.

Possibility is human inherent and we cannot predict it individually.

Probability is projected by what happened with other peers. There is an extrapolation of credible and significant statistical outcome analysis, concerning to survival and morbidity rates when comparing newborns with the same gestational age and weight.

At 23 weeks gestation a newborn has possibility but low probability of surviving.

These two concepts are inherent to human survival and the base of two possible ways of approach a fetus or newborn at the threshold of viability.

1.

Professionals can offer these newborns all the maximum treatments opportunities only because they have a chance to survive (possibility) stating the following arguments:

Only God can give and can take life (vital perspective)

Comparison of intervention’s results and other pathology (as cancer) with data from the adults’ Intensive Care

Progress: Advancing the knowledge frontiers and therefore the edge of evolution represents the theoretical experimentation corollary.

2.

In second possible approach NICU professionals recognize the possibility of survival and reflect about probability and quality of life as well, defining a threshold of viability in which we can offer all the maximum treatments opportunities. All these efforts can be withhold or withdrawal if there is a bad evolution with poor prognosis (mortality and morbidity), in an individualized prognostic strategy (Rohen N- Hastings Cen Rep 1986).

This process is called weighted viability (meaning reflected, individualized) and is the most adequate strategy to use in these situations.

**Process of weighted viability**

Before deciding viability healthcare professionals should have in consideration:

1. Data: Survival/ quality
2. Care continuity/ Health services’ Philosophy
3. Perinatal data
4. Parents

Access in Portuguese version:
5. Suffering
6. Costs/ Resources

1. Data: Survival/ quality

Consider information credibility when analyzing data (Evans D, Levene Arch Dis M-Child Fetal Neonatal Ed 2001):

- Selection Criteria
- Exclusions (malformations...)
- Death+ Life newborns; NICU Admissions
- Place, date, study type (regional/institutional)
- Demographic factors, race
- Post natal age (life/quality of life)
- Use of antenatal steroids and surfactant

It is fundamental to make reference to the evolution of all pregnancies and gestational age, as well as antenatal and neonatal care philosophy. The more significant data is the one collected from the local institution. If there is no specific data in the local hospital, professionals should take into account the regional/national data, as long as the institution has a similar level of care. International data can help NICU professionals but should never be the only argument leading to decision.

The data from Woods N et al- New England J Med 2000, allowed identify important outcome differences, according to the selected criteria. From 138 newborns with 22 weeks GA, 22 went to the NICU. Only 2 survived (less than 1% of the life newborns and 9% of those that went to NICU). From the survivors only one developed impairment (0.7% of the life newborns and 5% of those that went to NICU). Thus we can conclude that the results depend on the criteria selection, sometimes misleading information that can influence decisions.

2. Care continuity/ Health services’ Philosophy

The neonatal care plan definition implies care continuity, reflecting a common philosophy between obstetric and neonatology. This fact helps building a better trust relationship with parents. It is also essential to have discussed and approved guidelines, according to each GA and estimated weight. These guidelines will be the basis for parent information about the eventually premature delivery in borderline viability and should contain information about calculated risks for fetal / neonatal and maternal outcomes (present risks and future gestational risks). In case of in utero transportation all institutions involved should share common information and care.

3. Perinatal Data

- Gestational age (at borderline viability the chance of survival increases 2% per day)
- Ecografic elements: Estimated weight/ Sex / Single-multiple pregnancy
- Antenatal corticoids

Access in Portuguese version:
• Fetal Welfare/compromisse
• Antenatal/Post natal transportation/ Full resuscitation measures (CPR)

1- Rennie J- Arch Dis Child 1996
2- Stevenson D et al- Arch Dis Child Fetal Neonatal Ed 2000
4- NIC/Q- Pediatrics 2003
6- Davis D- Pediatrics 1993

The viability prognosis depends on some perinatal variables that can influence positively or negatively. Therefore we consider a positive influence additional days in GA, more weight, antenatal corticoids, in utero transportation so that the delivery can occur in a perinatal tertiary hospital. (…)

Negative influence factors are: multiple fetus gestation, fetal compromise (congenital anemia, severe delay in fetal growth, cardiopulmonary and neurological depression at birth, fetal exposition to drugs, intra uterus infection, major malformation, congenital sepsis, significant fetal suffering) and cardiopulmonary resuscitation with cardiac massage and drugs.

The best gestational age estimative of a fetus borderline viability should be the basis of all subsequent decision. The menstrual history supported by ecographic data are the best predictive method.

(…)

Benefits from Cesarean in the delivery of extreme preterm have not been proved in several studies, excluding the work ok Bottoms (Bottoms S, et al.- Am J Obstet Gynecol 1997).

4. Parents

Parent’s engagement in the process is fundamental for weighting viability. Careful, adequate, repeated and coherent information is the basis of this engagement and the construction of a solid and healthy trust relation between parents and professionals. Consequently there will be less emotional tension and conflicts in difficult decisions.

(…)

Parents have the right of express their option because:

- They have legitimacy to decide in order for something that is theirs
- They are the right ones to defend their son’s best interests
- They are the ultimate caregivers

If there are unsolved conflicts between parents and professionals, ethical commission should mediate it, looking for a way to achieve consensus that would avoid jurisprudence participation.
5. Suffering

Newborn and parents’ physical and psychological suffering, sometimes unbearable, must be taken in account when weighting viability.

(...) 

If the decision is to withdrawal or withholding intensive care it is mandatory do perform comfort care and support newborn and their parents with dignity.

6. Costs/ Resources

Professionals should balance between costs/ benefits and available resources, for obtaining a far and proper resource allocation.

(...) 

What’s happening in Portugal?

Since 1994, Portugal has the chance of monitoring the survival and impairment of extreme low weight in a national database used nationwide. Some data until 2001:

- Survivors less than 23 weeks are rare and all present impairment
- At 24 weeks the survival probability is near 50%, 15-20% with no impairment. Neonatal transportation is not frequent (4 cases) but in utero transportation occurred in 40% situations. According to the number of caesarian sections and antenatal corticoids we conclude that it is an important intervention performed by fetal indication.
- At 25 weeks survival probability is more than 50%. Half of the survivors have the risk of presenting impairment, but severe impairment is not high, perhaps because of withholding or withdrawing decisions.
- 11 UCIN registered survivors less than 26 weeks, only 6 with more than 4 survivors.
- 6 UCIN had survivors before 24 weeks.
- There is an important asymmetry on the regional intervention in newborns less than 26 weeks. The treatment efficacy appears to be higher in Lisbon NICUs. In North region the number of cases is smaller and the treatment is less effective.
- Hospitalization time of survivors were 216 day (23 weeks), 116 (24 weeks) and 92 day (25 weeks). This fact raises concerns on resources’ allocation and the capacity for treatment of newborns with no other compromise.

(...) 

Recommendations for practice:

a) Gestational age less than 23 weeks for sure
   i. In utero transport (IUT) is not recommended
   ii. Caesarean section not recommended

Access in Portuguese version:
iii. Neonatal comfort care. There is no need for neonatologist in delivery room.

b) 23 Weeks
i. IUT may be considered under obstetric advice or for better assessment of the fetus
ii. Caesarean section only for maternal reasons.
iii. Prenatal corticoids if doubt in gestational age by default

c) 24 Weeks
i. In uterus transport should be recommended. Parents should be well informed about the risks.
ii. Caesarean section – rarely performed for fetal causes.
iii. Prenatal corticoids – Yes
iv. Neonatal care
    Neonatologist / experienced pediatrician present at the delivery room
    Resuscitation after confirmation of gestational age
    Knowledge on parent’s expectations
    Assessment of newborn’s condition
    Decision to resuscitate should be immediate
    Stop resuscitation if no response after 10 minutes
    Intensive care:
    Monitoring situation continuously
    Alter decisions according to individualized prognosis (Use individualized prognosis strategy. keep parents updated)
    vi. Neonatal transportation
    Only when IUT was not possible
    Assure vital function maintenance in the birthplace hospital until neonatal emergency transportation arrives. Obstetricians should inform about transportation’s difficulties and additional risks.

d) > 25 Weeks
i. IUT always as possible.
ii. Cesarean section – for fetal causes.
iii. Antenatal corticoids – always
iv. Neonatal care
    Neonatologist / experienced pediatrician at the delivery room
    Immediate and full Resuscitation measures
    If adverse evaluation (malformations) stop resuscitation measures after 10 minutes if not efficient
    Defined recommendations about withdrawal of care
    Parents should have information. Knowing their preferences and expectations is mandatory although is not determinant.
    vi. Neonatal transportation
    Only when IUT was not possible
    Assure vital function maintenance in the birthplace hospital until neonatal emergency transportation arrives. Obstetricians should inform about transportation’s difficulties and additional risks.

References

Access in Portuguese version:


5. D Field, S Petersen, M Clarke ES Draper. Extreme prematurity in the UK and Denmark: population differences in viability *Arch Dis Child Fetal Neonatal Ed* 2002; 87 F172-F175.

6. DJ Devicyor, DT Nguyen, Laporte et le Groupe francophone de réanimation et d’urgence pédiatrique. L’arrêt des traitements curatifs en réanimation pédiatrique : comment la décision est-elle prise en France ?


Access in Portuguese version: