Premature Birth – Everything You Need to Know

With World Prematurity Day on November 17th, Wellbeing of Women - the UK health charity investing in the future of women and their babies by funding pioneering medical research - asked Dr Angharad Care, a Clinical Research Fellow working at the Harris-Wellbeing Preterm Birth Research Centre, to explain why raising awareness of prematurity is so important. The Harris-Wellbeing Preterm Birth Centre is based at the Liverpool Women's Hospital, a specialist maternity hospital that delivers more than 8,000 babies a year. The Harris-Wellbeing Preterm Birth Team runs a specialist clinic for women at risk of preterm birth and is currently carrying out pioneering research into the prediction and prevention of preterm birth.

Every year, 15 million babies are born prematurely worldwide – that's 29 babies every minute. Sadly, around one million of these babies will not survive and, globally, the rate of preterm birth is rising.

1. What is Prematurity?

Prematurity is a term used to describe all babies born below 37 weeks of pregnancy. A 'term baby' is born between 37 weeks and 42 weeks. Post-term or post-maturity pregnancy is when pregnancy continues into the 42nd week of pregnancy.

Not all prematurity is the same. Preterm babies have not had the same chance as babies born full term to grow and develop all their internal organs and many will need special or intensive care in a neonatal unit. The earlier in the pregnancy the baby is delivered, the less mature the baby's organs are and the more likely it is that those organs will suffer damage or not develop as they should.

Some babies will be born prematurely due to conditions severely affecting the health of the mum, such as pre-eclampsia, cancer or heart conditions which could be aggravated by pregnancy. These babies have to be delivered early to prevent serious illness in their mums and, in some rare cases, the mother will require treatment that could harm a baby in the womb.

Another group of mums will experience "spontaneous" preterm birth. This is when labour is triggered earlier in the pregnancy than expected. If a woman goes into labour before 22

weeks of pregnancy, the pregnancy is not considered "viable." This means that the baby is too small and underdeveloped to survive. This can also be called "late miscarriage."

However, the chance of a baby surviving at 22 weeks is extremely poor – statistically only 1% will survive and the chance of surviving without moderate or severe disability is just 0.4%.

Each day in the womb is critical for a baby's development. For example, in the UK, the chance of a baby born at 23 weeks surviving without disability is 8% compared with 59% at 26 weeks of pregnancy.

2. **What are the complications of prematurity and what are the implications for the baby?**

Not all preterm babies or "premmies" will experience complications, this depends on how premature a baby is and its weight at birth. The more premature a baby is and the lighter that baby is at birth, the more likely it is to have both short-term and long-term health problems. Some may be apparent at birth, whilst other disabilities may develop as the child grows.

A baby may have breathing difficulties due to immature lungs and many will require a ventilator to help with breathing. Babies may develop Respiratory Distress Syndrome as the lungs cannot expand and contract sufficiently to provide enough oxygen, if this does not get better, they can then go on to develop Chronic Lung Disease, (also known as Bronchopulmonary Dysplasia) and may require supplemental oxygen as they are growing.

The earlier a baby is born, the greater the risk of bleeding on the brain (intraventricular haemorrhage, IVH). Many bleeds are mild and resolve with little impact on neurodevelopment, but some babies have large bleeds which can cause permanent brain injury. There is some evidence that suggests that even late preterm babies have a higher rate of learning disabilities and attention deficit hyperactivity disorder (ADHD).

Premature babies are also at greater risk of developing heart conditions, the most common being Patent Ductus Arteriosus (PDA) and low blood pressure. PDA is the failure of a natural closing between two major blood vessels leading from the heart. Often this defect closes on its own but, if persistent, can cause too much blood to flow through the heart leading to heart failure.

Premature babies often need help with feeding as many haven't developed a swallow reflex. If the gut is too immature for milk, they may develop necrotising enterocolitis (NEC) – a very severe injury to the bowel which, at its worst, requires an operation to remove damaged bowel. Many of the babies undergoing this operation will not survive.

As a premature baby has an immature immune system, any infection contracted in the first few weeks of life can spread very rapidly and cause a life-threatening condition called sepsis. All of these health complications at such an early stage can lead to long-term health problems of cerebral palsy, learning disabilities, visual and hearing loss, behavioural problems, chronic lung disease and sudden infant death syndrome. For some parents, having a preterm birth means giving up on their careers to become full time carers.

3. What Causes Preterm Birth?

The causes of preterm birth are, unfortunately, poorly understood. Under the umbrella term of preterm birth, there are likely to be a number of causes and we don't often know why it happens. In some instances, an infection can trigger labour, but often there are multiple poorly understood factors. This is why the research into the causes of preterm birth was chosen as an area of focus at the Harris Wellbeing Preterm Birth Centre - it is virtually impossible to target the correct treatments to the right women without understanding the cause.

4. Who is at Risk of Preterm Birth?

There are some women who are at increased risk of having a preterm birth. Risk factors include:

- Having a previous premature birth
- Pregnancy with twins, triplets or other multiples
- Conceiving through in vitro fertilization
- Problems with the uterus, cervix or placenta
- Cervical surgery to remove large volume tissue (multiple LLETZ, or knife cone biopsy)
- Smoking cigarettes or using illicit drugs
- Poor nutrition
- Not gaining enough weight during pregnancy
- Some infections, particularly of the amniotic fluid and lower genital tract
- Some chronic conditions, such as high blood pressure and diabetes
- Being underweight or overweight before pregnancy

- Stressful life events, such as the death of a loved one or domestic violence
- Multiple miscarriages or abortions
- An interval of less than six months between pregnancies

5. Who does Preterm Birth Affect?

Preterm birth is a condition that affects almost everybody in the UK in a circuitous way. The cost of a preterm birth is not only an emotional cost for parents and communities, but also a very real financial cost to our economy. A study conducted by Oxford University in conjunction with the charity, Tommy's, has estimated that the cost of preterm birth to the British economy is approaching almost £ 1 billion each year.

Aside from the immediate trauma of coping, an unexpected preterm birth can lead to other very significant problems for couples. Post-natal depression, coping with feelings of hopelessness, worrying about bonding with a baby requiring care in an incubator, the stress of losing income if one parent is forced to become a full time carer, along with the chronic stress on relationships can lead to relationship breakdown, separation and divorce.

6. Can We Prevent Preterm Birth?

Sadly, not yet. At present, the prediction of preterm birth is poor and rates of preterm birth vary widely across the world. They occur across all resource settings and all income levels. Over the last 8 years, specialist clinics have become available in the UK to monitor parents who have previously experienced a previous preterm birth by monitoring the length of the cervix with ultrasound. Interventions are available to reduce rates of preterm birth by treating a short cervix. However, these clinics only reduce a very small number of the overall burden of preterm birth.

Improvements in healthcare in high resource settings mean that many more babies born preterm are surviving compared to 20 years ago, but rates of serious complications have not decreased. For low resource settings, death due to prematurity remains high.

7. What is being done in the UK to improve these heart-breaking statistics?

The only way to improve the outlook and our understanding of premature birth is through high quality, peer-reviewed research such as that being carried out by Wellbeing of Women.

Wellbeing of Women has invested over £8.1 million into preterm birth research over the past decades, with some of our early work paving the way for better treatment of preterm babies the world over.

In 1978 Wellbeing of Women funded Professor Colin Morley, to develop an artificial surfactant which, when puffed into the lungs of premature babies soon after birth, helped to sustain their breathing until their own natural surfactant* developed. This procedure is now used routinely and has brought great benefit to very small babies who are in a critical condition.

Wellbeing of Women has funded pioneering work into the use of cooling techniques to improve outcomes for babies affected by perinatal asphyxia which is much more common among premature babies, a condition resulting from oxygen deprivation which can cause disability or death. A recent study, funded by Wellbeing of Women, found that the use of the naturally-occurring hormone, melatonin, provided additional protective benefits above those achieved by cooling alone.

Wellbeing of Women continues to invest significant amounts of money into preventing and treating premature birth, and into the causes behind it. Thanks to the incredible generosity of Lord and Lady Harris of Peckham, The Harris-Wellbeing Preterm Birth Centre at the Liverpool Women's Hospital was opened in 2015. This centre is dedicated purely to the care of women and their babies at risk of, or who have suffered from, a premature birth.

Wellbeing has a rich legacy of funding high quality research into this area, yet the only way we can fund more of this ground-breaking research is with your help and generosity.

To support our work, please donate here, or to send your support directly to the Harris Wellbeing Research Centre send a JustGiving Text "HWWC15 £10/£5/£2" to 70070.

To find out more, please contact the Philanthropy Team at Wellbeing of Women on 0203 697 7000, or email Emily on emoore@wellbeingofwomen.org.uk.

Sources:

1. WHO Born Too Soon – The Global Action Report on Preterm Birth http://www.who.int/pmnch/media/news/2012/201204_borntoosoon-report.pdf

2. Data from EpiCURE and EpiCURE 2 - a population based studies of survival and later health status in extremely premature infants http://www.epicure.ac.uk/overview/overall-outcome/

3. With many thanks to Dr Angharad Care at the Harris-Wellbeing Preterm Birth Centre, Liverpool Women's Hospital.

*Surfactant is a naturally occurring substance produced by the lungs that helps maintain healthy lung function and breathing.

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