

What About The Children?

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'Raising awareness of the never-changing emotional needs of the under-threes in our ever-changing society'

Registered Address: Feldon House, Chapel Lane, Newbold on Stour, CV37 8TY.
Email: enquiries@whataboutthechildren.org.uk



Summary of Goodman Lecture, 2015

Vivette Glover
Professor of Perinatal Psychobiology, Imperial College, London

What happens in the womb can last a lifetime

The main focus of WATCh? has always been the first three years of a child's life. This lecture moved the story even further back, before birth. Professor Glover explained how the environment that a foetus experiences in the womb can influence the wellbeing of that individual throughout life, even into adulthood.

The lecture began with some surprising, perhaps even shocking, statistics about depression in pregnancy. At the time of the lecture, about 14% of all pregnant women experience some level of anxiety or depression, making these conditions the most common major complication of pregnancy. For comparison, pre-eclampsia is experienced in under 10% of pregnancies. Pregnancy and very early motherhood are themselves stressful, and the frequency of relationship problems, break-up and even domestic abuse is known to increase at these times.

The concept that external factors that affect the development of a foetus can have lifelong effects is termed foetal programming. Some of the most clear-cut examples of this are clear – foetal alcohol syndrome, for example, or the disabling effects of the drug thalidomide – but even much subtler influences can have dramatic effects. A British cardiologist and epidemiologist, David Barker, examined many factors that he thought might affect the risk of cardiac problems and found that a low weight at full-term birth was associated with a high risk of heart disease in later life. Low birth-weight infants were also discovered to be at greater risk for stroke and type 2 diabetes. Barker suggested that babies who grow less well in the womb are born with fewer cells in their kidneys and pancreas, and therefore are more vulnerable to metabolic stress in later life.

Professor Glover then went on to describe how the foetal brain is particularly sensitive to stress. It develops very rapidly throughout gestation, and the signals that a foetus receives from its environment affect the way that connections form between neurons. The subtle effects of even mild and transient maternal stress or anxiety can be measured using simple experiments. In one, mothers in late pregnancy were asked to perform mildly stressful tasks, such as mental arithmetic, and asked whether they felt anxious. The foetal heart rate was monitored during these tasks; an increase in heart rate was identified only for those whose mothers reported anxiety.

Many studies have quoted examples where stress in pregnancy has been seen to have a measurable effect on the wellbeing of babies and children. These have monitored many different types of stress, ranging from maternal anxiety and depression to the effect of

natural disasters such as ice storms and hurricanes, or un-natural ones such as the Six Days' War in Israel or the 9/11 terrorist attacks in New York. The types of adverse outcomes that have been linked to prenatal stress include sleep problems and 'difficult' temperaments in babies, and anxiety, ADHD, cognitive problems and bullying in older children. There have been some suggestions of a link with more severe conditions such as autism and schizophrenia, but these have not been substantiated.

Researchers have used data from the Avon Longitudinal Study of Parents and Children (ASLPAC) to examine the effect of maternal anxiety and depression on child development. This study recruited thousands of pregnant women in Avon in the early 1990s, and followed their progress and that of their children into adolescence. They separated out the 15% of children whose mothers had reported the highest anxiety scores during pregnancy and compared their behaviour with those of their peers at ages between four and 13. The children of the anxious and depressed mothers were more likely than the others to have behavioural problems. A similar effect was noted with children whose mothers had experienced post-natal depression, and the most marked problems were noted in children whose mothers had experienced depression both pre- and postnatally. Nevertheless, a large majority of children even in this group showed no particular behavioural difficulties.

Professor Glover went on to explain that the reason why some babies and children seem to be much more sensitive to prenatal stress than others arises from genetics. People with variants of several genes have been recognised as being more sensitive to forms of stress, including their mothers' stress during pregnancy. One of these genes is COMT, which provides the code for a protein that degrades important hormones in the nervous system, including dopamine and adrenaline. Children with one form of this gene are more likely to have problems with their working memory at the age of eight and to be diagnosed with ADHD at 15. These effects are more severe in children of mothers who were anxious during pregnancy, but maternal anxiety has very little effect on children with other variants of this gene. The science of the interaction between genes and the environment is known as epigenetics; the mechanism involves chemical modifications that control how genes are switched on and off, and these effects can sometimes persist into the third generation.

Cortisol, sometimes known as the 'stress hormone', is another hormone that is important in pregnancy and foetal development. Normally there is an enzyme in the placenta that breaks down this hormone, and cortisol levels in the amniotic fluid increase when expression of this enzyme is lost or reduced. Higher levels of cortisol in the amniotic fluid have been associated with poor development in toddlers as measured by the Bayley Scales of Infant Development. Interestingly, however, this association was found to be significant only in toddlers who were insecurely attached to their main care-givers. *Sensitive early mothering, it seems, is likely to protect against many of the disadvantages arising from exposure to a stressful environment before birth.*

Professor Glover continued by discussing a possible evolutionary origin for the association between prenatal stress and the types of problem behaviours that she had highlighted. She suggested that our early ancestors faced severe stresses that are rarely, if ever, seen in sophisticated 21st century societies, and that behaviour patterns that we now categorise as, for example, anxiety and ADHD might be helpful in, for example, keeping a vigilant watch for predators.

The final section of the lecture was a manifesto for change. Anxiety and distress in pregnancy are so common that the adverse effect on even a small fraction of the babies and children involved represents an immense cost to society. Currently, however, these problems are not given the attention that they deserve. Of every hundred pregnant women with symptoms of depression, only 40 will be diagnosed and only 10 will receive appropriate

treatment in the UK. Excellent care does exist, as it does in comparable countries, but it is patchy. A recent report from the London School of Economics put the cost of perinatal mental illness at £8 billion a year, 72% of which arises from problems developing in childhood and beyond. Investing in children at the earliest opportunity – providing extra emotional support for women when they are pregnant – should reduce some of this huge financial and social cost. And while the State and professionals have a clear role in this, it is just as important to highlight the importance of this issue with those who employ pregnant women, and their partners, families and friends.