

PRESS RELEASE

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**SUSCEPTIBILITY TO PAIN IS AFFECTED BY PREMATURE
BIRTH AND ALSO GENETICS**

Scientists in US and UK laboratories have made key discoveries into the elusive nature of pain in children and adults. The results, presented at the Forum of European Neurosciences today (Monday 14 July) will help guide the future management and treatment of pain.

"The nervous system in premature and newborn babies has not completed its development," said Dr Suellen Walker from the University College London Paediatric Pain Research Group. "Alterations in nerve activity due to pain and injury can upset normal development." An injury, in this case, may mean intensive care procedures and surgery in preterm babies that can have long term consequences on pain sensitivity in later life.

Tests were carried out on 43 children aged 11 years who were born extremely preterm at around the 25th week of pregnancy. All required intensive care after birth and some had also required major surgery. A thermal probe was placed on the palm of their hand and near any scars on their chest from operations or procedures such as chest drains. As the temperature of the probe changed, children were asked to press a button when they felt different sensations, such as cold and hot. Another test measured the pressure at which they could feel light touch. Their responses were compared with children who were born at full-term and had not required intensive care or surgery in early life.

Dr Walker found that children who had been born preterm were generally less sensitive to temperature, and changes were more marked in those who also had required surgery. This suggests that long term changes in sensory processing have occurred which may impact on how children respond to pain in the future.

Looking back at the children's time in intensive care, many non-specific factors could affect later behaviour and pain responses, such as brain injuries, infections, and medications. The current study suggests that specific changes also occur in how the nervous system detects and responds to temperature sensations, which is transmitted by many of the same nerve fibres required for pain sensation.

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"We are beginning to see what factors contribute to the degree of changes in pain sensitivity. This new information allows us to identify children who may have altered responses to pain in later life, and also has implications for the management of pain in babies who require surgery, as different pain treatments may modify or prevent long-term changes" she said.

In the USA, Professor Clifford Woolf from the Massachusetts General Hospital and Harvard Medical School in Boston has carried out a series of clinical and laboratory studies into the genetic variance in patients with chronic pain.

"Following surgery, some patients who have nerve damage don't feel pain afterwards and yet others do. We are trying to work out why," said Professor Woolf. "Part of it is the nature of the surgery, 15% of patients operated on to repair a hernia experience chronic pain whereas 40% of patients who have chest surgery develop persistent pain, but the risk is heavily influenced by our genes".

His team has found genes that have common polymorphisms – or variations - associated with more or less chronic pain. "We wanted to know what the risk factors are in some patients. We have found a pain-protective gene variant where one copy on a chromosome provides about 25% of people with a reduced risk of developing pain, while 3% have two copies of the variant and are highly protected from chronic pain," he said.

Previous research in twins has shown that 50-60% the range of normal pain sensitivity is inherited. The next stage of their studies is to develop drugs to help patients at risk of pain by imitating the effects of the natural pain protective gene variants. Professor Woolf concluded, "Having identified genes associated with pain it will be easier to develop drugs to convert those unfortunate individuals who have inherited a high risk of developing chronic pain to resemble those who are fortunate to have inherited a low risk."

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ABSTRACT A054.1, A054.2

Notes to Editors

FENS 2008 is hosted by the Swiss Society for Neuroscience and will attract over 5,000 international delegates. The Federation of European Neuroscience Societies, founded in 1998, aims to advance research and education in neuroscience, representing neuroscience research in the European Commission and other granting bodies. FENS is the European partner of the American Society for Neuroscience. FENS represents a large number of national European neuroscience societies and has around 16000 members. <http://fens2008.neurosciences.asso.fr/>