Poverty mars formation of infant brains

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By Clive Cookson in Boston
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Poverty in early childhood poisons the brain, the American Association for the Advancement of Science meeting in Boston heard on Friday.

Neuroscientists said many children growing up in very poor families with low social status experience unhealthy levels of stress hormones, which impair their neural development. That effect is on top of any damage caused by inadequate nutrition and exposure to environmental toxins.

Studies by several US universities have revealed the pervasive harm done to the brain, particularly between the ages of six months and three years, from low socio-economic status.

Martha Farah, director of the University of Pennsylvania's centre for cognitive neuroscience, said: "The biggest effects are on language and memory. The finding about memory impairment - the ability to encounter a pattern and remember it - really surprised us."

Jack Shonkoff, director of Harvard University's centre on the developing child, said policymakers had to take note of the research because "the foundation of all social problems later in life takes place in the early years".

"The earlier you intervene [to counteract the impact of poverty], the better the outcome in the end, because the brain loses its plasticity [adaptability] as the child becomes older," he said.

Stress hormone levels tend to be higher in young children from poor families than in children growing up in middle-class and wealthy families, said Prof Shonkoff. Excessive levels of these hormones disrupt the formation of synaptic connections between cells in the developing brain - and even affect its blood supply. "They literally disrupt the brain architecture," he said.

The findings explain why relatively unfocused programmes to prepare poor children for school, such as Head Start in the US, have produced only modest results, the scientists said.

More focused interventions could give more substantial benefits, said Courtney Stevens of the University of Oregon. She gave the preliminary results of an eight-week programme aimed at poor parents of pre-school children in Oregon.

Parents attended weekly coaching sessions to improve their family communications skills and show them how to control their children's bad behaviour. At the end of the programme, participating parents reported big reductions in family stress compared with a control group that did not take part. Brain scans of the children suggested neural improvements, too.

"Our findings are important because they suggest that kids who are at high risk for school failure can be helped through these interventions," said Dr Stevens. "Even with these small numbers of children, the parent training appears very promising."

Well-tailored programmes can help, Prof Shonkoff agreed. But in the end, the only way to remove the "toxic" impact of poverty on young brains is to abolish poverty itself, he said.