

# Vitamin C deficiency impairs early brain development

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Guinea pigs - like humans - are dependent on getting sufficient vitamin C through their diet. Studies show that new-born guinea pigs subjected to vitamin C deficiency have a markedly worse memory than guinea pigs given enough vitamin C. Maybe this also applies to human beings?

(PhysOrg.com) -- Faculty of Life Sciences at University of Copenhagen shows that vitamin C deficiency may impair the mental development of new-born babies.

In the latest issue of the well-known scientific journal the [American Journal of Clinical Nutrition](#), a group of researchers headed by professor Jens Lykkesfeldt shows that [guinea pigs](#) subjected to moderate vitamin C deficiency have 30 per cent less hippocampal neurones and markedly worse spatial memory than guinea pigs given a normal diet. Like guinea pigs, human beings are dependent on getting vitamin C through their diet, and Jens Lykkesfeldt therefore speculate that vitamin C deficiency in pregnant and breast-feeding women may also lead to impaired development in foetuses and new-born babies.

## The brain retains vitamin C

Several factors indicate that the neonatal [brain](#), in contrast to other tissue, is particularly vulnerable to even a slight lowering of the vitamin C level. The

highest concentration of vitamin C is found in the neurons of the brain and in case of a low intake of vitamin C, the remaining vitamin is retained in the brain to secure this organ. The vitamin thus seems to be quite important to brain activity. Tests have shown that mouse foetuses that were not able to transport vitamin C develop severe [brain damage](#). Brain damage which resembles the ones found in premature babies and which are linked to learning and cognitive disabilities later in life.

## Widespread vitamin C deficiency

In some areas in the world, vitamin C deficiency is very common - population studies in Brazil and Mexico have shown that 30 to 40 per cent of the pregnant women have too low levels of vitamin C, and the low level is also found in their foetuses and new-born babies. It is not yet known to what extent new-born babies in Denmark or the Western World suffer from vitamin C deficiency but a conservative estimate would be 5 to 10 per cent based on the occurrence among adults.

"We may thus be witnessing that children get learning disabilities because they have not gotten enough vitamin C in their early life. This is unbearable when it would be so easy to prevent this deficiency by giving a vitamin supplement to high-risk pregnant women and new mothers" says Jens Lykkesfeldt whose research group is currently studying how early in pregnancy [vitamin C](#) deficiency affects the embryonic development of guinea pigs and whether the damage may be reversed after birth.

More information:

[www.ajcn.org/cgi/rapidpdf/ajcn.2009.27954v1](http://www.ajcn.org/cgi/rapidpdf/ajcn.2009.27954v1)

Source: University of Copenhagen

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