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Famine in Nigeria and vitamin D in Sweden: two early life exposures and their relation to cardiovascular risk in adulthood

Akademisk avhandling

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Abstract

Early life environment has in previous research been linked to risk of disease in adulthood. This thesis investigated three types of early life exposures and their potential associations with adult life cardiovascular risk. It has been proposed that early life malnutrition underpins the ongoing epidemic of lifestyle-related diseases in Sub-Saharan Africa. We examined the association between exposure to the Biafra famine (1968-1970) and cardiovascular risk in 1,339 Nigerians. Individuals exposed to famine in fetal-infant life had higher blood pressure, plasma glucose and BMI compared to individuals born after the famine. Malnutrition in early life may contribute to the burden of lifestyle-related disease in Sub-Saharan Africa (Paper I).

Vitamin D deficiency is prevalent among women of childbearing age worldwide. Adult vitamin D deficiency has been linked to increased risk of cardiovascular disease, impaired glucose tolerance and obesity. We aimed to assess whether vitamin D status at birth is related to cardiovascular risk in adulthood. In paper II, neonatal vitamin D concentrations from stored blood samples were measured and cardiovascular risk markers assessed in 275 individuals aged 35 years born either in the end of the summer or in the end of the winter. We found no associations between low neonatal vitamin D status and cardiovascular risk at 35 years of age. However, men and women in the highest neonatal vitamin D quintile were at higher risk of being overweight (Paper II).

The prime determinant of vitamin D status is exposure to sunlight. Month of birth is a proxy for a number of seasonally dependent environmental exposures including nutrition, infections, lifestyle factors – and vitamin D. At high latitudes, vitamin D levels in populations are lower in the winter compared to the summer due to scarce sunlight exposure. In the Swedish population aged 30 or above (>6 million individuals), followed from 1991 during 20 years, individuals born during autumn months lived longer than those born during spring months. The association between month of birth and mortality was particularly pronounced in the age-span 50 to 80 years and not significant before 50 years (Paper III). In the age-span 50 to 80 years, cardiovascular mortality was increased among spring-born compared to autumn-born. (Paper IV)

Although individuals born in Sweden during the spring had an increased risk of cardiovascular mortality in ages 50 to 80 years (paper IV), the effect sizes were small. The lack of an association between low neonatal vitamin D status and adult cardiovascular risk in paper II indicate that vitamin D levels at birth may not be of sizeable importance to adult life cardiovascular health.