

Introduction

Childhood obesity is associated with short- and long-term morbidity and subsequent long-term mortality^{1;2}. A large body of research has documented a firm relation between childhood obesity and development of type II diabetes, hypertension, non-alcoholic fatty liver disease, polycystic ovary syndrome, poor mental health and various types of cancer¹⁻⁴. Childhood obesity has increased dramatically in the last decades in low as well as high income settings^{5;6} and may persist into adulthood⁷⁻⁹. Likewise, the prevalence of obesity in women of child-bearing age has increased¹⁰. The World Health Organization (WHO) has declared obesity to be one of the largest health challenges in this century¹¹. The American Medical Association's Council on Science and Public Health Report identified obesity as a multi-metabolic and hormonal disease in 2013¹².

Once established, childhood obesity is difficult to treat, and most interventional efforts have a modest impact. Early targeted prevention is warranted¹³. Unless effective preventive strategies to reduce obesity are developed, the steady rise in life expectancy in the Western world may come to an end. The youth of today may be the first generation to experience a higher rate of morbidity and possibly live a shorter life than their parents¹⁴. Pre- and postnatal conditions are of highest importance when examining the multifactorial and very complex pathogenesis of obesity, as proposed in the Developmental Origins of Health and Disease hypothesis^{15;16}.

To design appropriate interventions, detailed knowledge of early risk factors is of importance. In this thesis, attention is directed toward a group of children at risk of obesity: children born of obese mothers. This group is exposed to a less favorable intrauterine environment due to maternal obesity and excessive gestational weight gain (GWG), have a higher mean birth weight and a lower prevalence of breastfeeding, all factors possibly contributing to the increased risk of the subsequent development of obesity¹⁷⁻¹⁹. Birth weight is, however, a rather crude measure. Assessing newborn body composition provides a more detailed description, which may be useful when exploring the early origins of obesity²⁰. The influence of breastfeeding on subsequent growth has been heavily debated in recent years. Large meta-analyses have found a significant protective effect of breastfeeding on obesity^{21;22}, but the well-conducted randomized PROBIT study found no effect²³. Previous studies on breastfeeding include a low proportion of obese women, because this group has problems both establishing and maintaining breastfeeding. Interventional and observational studies examining the effect of breastfeeding on growth in offspring of obese women have not been done.

In this thesis, newborn body composition is in focus, and how it is affected by maternal obesity, GWG and growth factors will be examined. Further, the effect of a breastfeeding intervention initiative targeting obese mothers and their offspring is evaluated. The long-term perspective of the thesis

is to contribute to more effective preventive strategies against childhood obesity. This is, however, conditioned by an ongoing follow-up of the cohort and is not included in the thesis but will be reported in future studies.