

# Commentary on “Estimation of Newborn Risk for Child or Adolescent Obesity: Lessons from Longitudinal Birth Cohorts”

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Childhood obesity is an increasingly prevalent problem, associated with obesity later in life, and a sequelae of health problems such as metabolic syndrome and an increased risk of coronary heart disease. Poor nutrition and a lack of physical activity are said to be causes of obesity development, with genetic factors and heritability also implicated. However, there are established, identifiable risk factors associated with the future development of obesity, both in childhood, and adolescence. These include parental weight before pregnancy, gestational weight gain, pre-pregnancy maternal smoking, as well as numerous socioeconomic factors.<sup>1–4</sup> Studies have also shown that once obese, children can find it very difficult to lose the excess weight,<sup>5</sup> with long-term management methods having shown poor efficacy.<sup>5</sup> Therefore, preventative strategies are becoming a high priority to battle the ever-increasing epidemic of childhood obesity. This study by Morandi *et al.*<sup>6</sup> is the first longitudinal study to analyse the predictive properties of early life risk factors for obesity, and propose a subsequent predictive algorithm to identify newborns most at risk of becoming obese in childhood and adolescence.

Morandi *et al.*'s study aimed to develop a clinically useful formula, which could be used to identify the risk of future obesity in newborns, thereby enabling more efficient implementation of prevention strategies.<sup>6</sup> The lifetime Northern Finland Birth Cohort 1986 (NFBC 1986) was used to form predictive equations for both childhood and adolescent obesity, based on established risk factors: parental BMI, birth weight, maternal gestational weight gain, and socioeconomic factors. A genetic score was also created based on 39 BMI/obesity-associated polymorphisms. Validation studies were performed on both a retrospective cohort of children from Veneto, Italy, and a prospective cohort of children from Massachusetts, USA.

Parental BMI, birth weight, maternal gestational weight gain, number of household members, maternal professional category, and smoking habits were all independent predictors of all or most of the six obesity outcomes. Parental BMI was the main contributor to discrimination accuracy, while others contributed moderately to its effectiveness. The study also demonstrated that the accuracy of the algorithm did not differ from childhood into adolescence, suggesting that these established associations are stable into early adulthood. When adding the genetic score to these traditional factors, there was a modest discrimination improvement of  $\leq 1\%$ .

There are several factors which still need to be accounted for before the results of this study can be effectively adopted in a clinical setting. The authors acknowledged a lack of external validation as a weakness of this study.<sup>6</sup> Discussing the potential for a child's ill health can be rather sensitive topic with a parent and, therefore, the algorithm needs to be fully validated before potentially stigmatising at-risk families, or giving false-reassurance to parents. The most appropriate communicative approach is also needed for this purpose. However, it is thought that knowledge of a baby's increased obesity risk may lead parents to act more readily on early-life

health advice on nutrition, monitoring recreational habits, and how/when to wean from breastfeeding.<sup>7</sup>

Currently, prevention focuses on targeting both nutrition and physical activity at home and in schools through pathways such as the the Public Health Responsibility Deal and the Change4Life programme.<sup>8,9</sup> However, many children are becoming overweight and obese before reaching school age.<sup>10</sup> In fact, the 2011–12 data from the National Child Measurement Programme states that 22.6% of children aged 4–5 years were either obese or overweight.<sup>11</sup> Additionally, the latest Health Survey for England (HSE) data showed that, in 2010, 30.3% of children aged 2–15 were overweight or obese.<sup>12</sup> Hence, there is a need to identify at-risk children prior to schooling age. Following identification, implementation of preventative strategies, derived from these tools, is required. These strategies need to go beyond those provided to the general public as a whole. Therefore, research should now focus on which preventative strategies are most beneficial for identified, high-risk, patients. Additionally, algorithms must be made into cost-effective and easily calculable tools to support the identification of such patients, while increasing the accuracy to reduce the risk of false reassurance.

This study was the first to create a readily usable algorithm for predicting obesity development using established risk factors from birth. In turn, this should allow for future trials to establish the most efficacious preventative strategies for at-risk groups. The good negative predictive value found in this study would exclude a large proportion of the infant population from requiring such preventative measures, and hence provide both health and cost benefits. Working in this way, in conjunction with existing general population awareness campaigns such as Change4Life;<sup>9</sup> the Move, Eat, Treat campaign;<sup>13</sup> the eatwell plate;<sup>14</sup> and the Public Health Responsibility Deal<sup>8</sup> will help communicate appropriate messages and increase awareness, in turn promoting a healthy lifestyle and reducing the burden of the obesity epidemic.

### *Ethical approval*

No ethical approval required for this study.

### *Conflict of interest*

No conflicts of interest have been declared by the author.

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Single author manuscript.

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