



Epigenetics and Childhood Obesity: From Uterus to Childhood

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Editorial

Childhood obesity is already an epidemic in the developed and developing countries, worldwide. Many studies, such as the Bogalusa Heart Study, have shown an association to adulthood obesity with many adverse outcomes, including metabolic syndrome and its target organ consequences [1]. In the United States childhood obesity rates have increased from 5% to approximately 20%, in the past 30 years. In Greece, these rates are also extremely high, keeping a leading place in European charts, ranging from 4% to 11%, with approximately one third of Greek children being overweight and obese [2,3]. Many factors play a role in the development of childhood obesity. Among the modifiable factors are diet, physical activity, family income and parental habits, such as smoking and working schedule. There are also unmodifiable factors, such as intrauterine maternal and genetic [4]. Latest studies have shown that epigenetics also play a crucial role in the development of obesity. The term “epigenetics” refers to all heritable mitotic and meiotic alterations in gene expression potential that occur without alterations in DNA sequence, due to interactions of genes with their environment, leading to post-translational and post-transcriptional modifications [5]. Epigenetic alterations can be caused by environmental chemicals, pharmaceuticals, ageing, diet and *in utero* factors. These alterations include DNA methylation, as well as histone modification in gene regulatory regions. These alterations are thought to be etiologically linked to childhood obesity from uterus to childhood [6]. In uterus, maternal lifestyle factors that may cause these epigenetic modifications are stress, poor diet and low levels of physical activity, as well as other intrauterine exposures, such as gestational diabetes mellitus, excessive weight gain and maternal obesity [7]. Prevention of childhood obesity attracts increasing interest lately. Awareness of the role of epigenetics alterations to childhood obesity should be raised in social and scientific communities. Pediatric care providers should be able to recognize children at high risk for overweight and obesity and suggest specific lifestyle modifications, such as exercise and diet, in order to avoid any epigenetic alteration in childhood and adolescence. Moreover, Gynecologists should advise pregnant women to attain certain levels of physical activity and follow a diet with all necessary nutrients and vitamins to prevent any negative exposure of the embryo to epigenetic factors.

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