Interview

Childhood obesity: a growing problem

Dr Jennifer Miller is an Assistant Professor of Pediatric Endocrinology at the University of Florida in Gainesville, FL, USA. She completed both residency and fellowship at the University of Florida. Dr Miller sees children with a wide spectrum of endocrine disorders, but her primary interest is in neuroendocrinology. She specializes in the care and treatment of children with Prader–Willi syndrome and early-onset obesity. Her research focuses on the causes and effects of early childhood weight gain, specifically on how obesity in young children can affect the developing brain.

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■ How did you become interested in the field of pediatric overweight & obesity?

I have always had an interest in this area. As a medical student I worked in a rural clinic in an underdeveloped area and saw a lot of obese children who were severely affected by their obesity. Initially, I was interested in the psychosocial effects on their relationships and feelings of self-esteem. My interest now is mainly focused on the effect of childhood obesity on the developing brain and how that influences cognition and psychological aspects.

■ How serious is the problem of pediatric overweight & obesity in the developed world?

It is very serious. The most recent data from the 2006 National Health Examination Survey in the USA, show that 32% of children aged 2–19 years are considered overweight, and 11% of those are considered seriously obese with a body mass index (BMI) for their age of greater than the 95th percentile. The most concerning aspect from my perspective is that younger children are more significantly obese than older children: more children are obese in the 2–3 year age range than in the 10–12 year age range. The incidence is increasing in the very young as well as the adolescents: to me this is a very serious problem. Becoming obese in early life has serious effects on morbidity and mortality, so we are looking at significant health risks and healthcare costs for these individuals as they become young adults in the future. These trends are occurring in Europe and Asia, as well as the USA.

■ What are the main factors contributing to the increase in pediatric overweight & obesity?

Because this epidemic has happened so quickly, over the last 20–30 years, it is probably environmental rather than genetic. There are genetic factors that put you at risk for overweight and obesity, but I think the strongest driver for this epidemic is environmental. Children are eating more high-calorie 'junk' foods, as these become more affordable. Children are less active and more inactive: spending more time watching television and playing computer games rather than being outside riding their bikes.

■ What evidence is there for a link between maternal & child obesity?

Epidemiological evidence that obesity in pre-pregnancy predisposes the resulting infants to overweight and obesity in childhood. Data indicates that obese mothers tend to give birth to children with increased birthweight, are less likely to breastfeed and are more likely to have overweight children than nonobsese mothers. Several studies have shown that the two strongest risk factors for childhood obesity are maternal BMI and weight gain during the first 2 years of life.

■ What are the effects of serious overweight in very early childhood?

We are seeing premature morbidity from childhood obesity with comorbidites of obesity that were traditionally not seen until adulthood now being identified in children. Children with obesity are developing fatty liver disease, dylipidemia, hypertension, chronic joint/back pain from increased weight, insulin resistance and Type 2 diabetes. We are now seeing

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children as young as 6 years with Type 2 diabetes. That used to be unheard of, but now that children are becoming obese so young, it is more common. This will lead to various complications as these children get older, including cardiovascular disease, eye problems and amputations.

My research focuses on the developing brain. We think that becoming obese early in life could cause damage to the brain. This could occur neurochemically, as fat is an endocrine organ and secretes many hormones (e.g., adipokines), or simply due to fat deposition in the brain. It is thought that fat can cross the blood–brain barrier more easily in children, since their brains are not fully myelinated. In young children with obesity we see fat deposition in the muscles and organs, so it is conceivable that we would also see it in the brain. When we conduct MRI scans of children who are obese in early life, we often see white matter lesions in the brain similar to those seen in elderly adults with dementia or Alzheimer disease. We are not sure exactly what that represents, but it is present very early in life, as young as age 8 years. In addition, these children tend to be cognitively behind their nonobese siblings. They are not mentally retarded, but their IQ is lower, suggesting that the development of early-onset obesity may be the cause of the cognitive delay as well as the premature white matter lesions. This could have a huge effect on our society, given the large numbers of children who are obese.

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■ **What can pediatricians & family physicians do to help prevent overweight & obesity in children?**

The main thing is that they need to know how to plot the BMI for children: in adults it is a simple calculation, but in children you need to take into account age and gender – it is a moving target. Physicians need to calculate BMI at every visit, to identify children who are obese or at risk of obesity in order to provide counseling about lifestyle modifications and explain why being at risk for childhood obesity is such a problem. This also allows the physician to initiate screening and risk assessment for comorbidities. There is a lot of research suggesting that parents are not aware that their children are obese, so it falls to the physician to educate the parents so that lifestyle modifications can be implemented early to prevent or reverse obesity.

■ **What action do you think needs to be taken by governments & policy-makers to address this problem?**

It is important that governments recognize this problem and take action. A major priority here in the USA is to work towards improving the quality of food in schools. Children from low-income families are given free school meals, which often consists of doughnuts or sugary cereals for breakfast, and hamburgers and french fries for lunch. In addition, vending machines are available in many schools, providing unhealthy drinks and snacks. There is a big campaign in California at present that is trying to replace sugary drinks in these vending machines with natural fruit juice and water.

In terms of advertising, governments need to spend more money promoting healthy eating in children. At present, at least in the USA, advertising targeting children is dominated by companies selling high-fat, high-calorie food and drink.

Lastly, community efforts, in churches and schools for example, are needed to educate families about healthy lifestyles.

■ **What is the place of drug & surgical therapies in treating severely obese children & young adults?**

There is a place for them, but it is limited. For a child to be on long-term medication or undergo surgery, not only does the child need to be psychologically ready, but the family has to commit to the treatment program. Preventing and treating obesity in children has to be an entire family effort to get results. Adults are cognitively aware enough to make those decisions and avoid the things that are bad for them: children do not have that long-term perspective, which limits their success with these methods if the family are not prepared to make lifestyle changes as well.

■ **What long-term problems can we expect to see if the rising levels of childhood overweight & obesity are not checked?**

We are going to see much more premature morbidity and mortality from the comorbidities of obesity: we are already seeing early Type 2 diabetes and we are

likely to start seeing heart disease, strokes and orthopedic problems. In addition, the possibility that obesity causes damage to the developing brain is there. Adults who are obese at middle age are at increased risk of early development of Alzheimer's disease. There is a concern that childhood obesity might have a similar, or even greater, effect.

■ Do you think we will be able to control the situation before it causes further serious public health problems?

I am hopeful. There was a recent study that showed that the rate of childhood obesity seems to be slowing, even though younger children are now being affected. The public and physicians are becoming more aware of the problem, which will hopefully lead to better control. However, this is a worldwide problem, and it will take a worldwide effort to get it under control.

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