Dietary Intervention Combined With Exercise Improves Vascular Dysfunction but Also Obstructive Sleep Apnea in Obese Children

To the Editor:

We write in response to the article “Effects of Diet and Exercise on Obesity-Related Vascular Dysfunction in Children” by Woo et al. We agree with the conclusion of Woo et al that diet and exercise should be regarded as an important strategy to reduce the risk of arterial dysfunction in obese children. However, we believe Woo et al overlooked the important issue of obstructive sleep apnea syndrome (OSAS) in obese children.

Woo et al used a prospectively defined value based on US reference data, i.e., body mass index (BMI) >23, to define obesity. A fixed BMI value should not be used in children for defining obesity because the normal range of BMI varies with age and gender. Moreover, data from the United States cannot be used as an international reference. For Hong Kong, local data are available, and the value for obesity is the 97th percentile of BMI. OSAS affected 13% to 36% of obese children. Nieto et al and Ip et al found that OSAS is a potent risk factor of endothelial dysfunction as measured by flow-mediated vasodilatation. Hence, OSAS represented an important confounding factor that was completely ignored in the study by Woo et al. Exclusion of known medical diseases will not exclude OSAS, which is usually asymptomatic in children. The “gold standard” for screening of OSAS in children is sleep polysomnography. Nonetheless, habitual snoring and observed apnea were shown to be important symptoms of OSAS. To exclude the effect of OSAS, Woo et al should at least exclude those with these two symptoms. We believe that a considerable portion of obese children enrolled in the study by Woo et al had undiagnosed OSAS. We suspect that the mechanism of reversibility of obesity-related vascular dysfunction discovered in their study was favorably affected by the improvement of OSAS, as previous studies have shown that weight reduction alone can reverse OSAS.

To the Editor:

The striking feature of the article by Woo et al is not so much that obesity-related vascular dysfunction in children is reversible with diet ± exercise but that these children are all Chinese. Chinese used to be known for their slender build. As a matter of fact, one rarely encountered an overweight person in old China. Now obesity has become an epidemic in China, among both adults and children. The lack of obesity in China in the past was attributed to ethnic background and genetic predisposition. The findings of Woo et al certainly dispel this misconception. Obesity, like atherosclerosis, is an acquired disorder. That atherosclerosis results from westernization of lifestyle has been amply demonstrated in the Japanese as well as Chinese populations. As my mentors, I. Snapper and W. Dock, used to say, if you live and eat like an American, you die like an American.

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Response

We thank Drs Ng et al and Cheng for their interest in our work and their comments. We, too, are alarmed at the striking increases in obesity in childhood in China and indeed throughout many countries in the developing world.

We agree that the definition of obesity has been rather arbitrary, particularly in children. Nevertheless, what we have demonstrated is that some degree of relative obesity, whether overweight or gross obesity in children, is associated with arterial endothelial dysfunction and intima-media thickening, both as markers of early atherosclerosis as compared with lean children. We acknowledge that undiagnosed obstructive sleep apnea (OSA) may have been present in some children, but overnight polysomnography was regarded as impractical in this community-based sample of children. However, we consider OSA highly unlikely to have been an important confounder in our study. Our data showed near complete normalization of vascular function with sustained exercise, even though there was no significant overall change in body mass index. This argues (1) that exercise is important in restoring vascular function, even if obesity is not cured, and (2) that exercise is an effective intervention, regardless of OSA status.

We therefore regard exercise as almost certainly a much more practical solution than nocturnal continuous positive airway pressure, a therapy not well accepted or complied with in the pediatric population.

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Dietary Intervention Combined With Exercise Improves Vascular Dysfunction but Also Obstructive Sleep Apnea in Obese Children
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An erratum has been published regarding this article. Please see the attached page for:
/content/110/19/3156.2.full.pdf
In the article “Omega-3 Fatty Acids in Cardiac Biopsies From Heart Transplantation Patients: Correlation With Erythrocytes and Response to Supplementation,” by Harris et al, which appeared in the September 21, 2004, issue of the journal (Circulation. 2004;110:1645–1649), the authors have identified 2 errors. On page 1646, under the heading “Plasma Lipids and Lipoproteins,” the abbreviation in parentheses on the third line should be HDL-C, not LDL-C. Also, in the final line in column 1 of page 1648, the word “not” was omitted. The sentence should read, “We found that RBC EPA+DHA was not altered in postprandial blood from 10 healthy volunteers...” The authors regret these errors.

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Regarding the Correspondence page “Dietary Intervention Combined With Exercise Improves Vascular Dysfunction but Also Obstructive Sleep Apnea in Obese Children,” which appeared in the September 21, 2004 issue of the journal (Circulation. 2004;110:e314), it has been brought to our attention that this title is misleading. The 2 letters on this page pertained to an article published in the April 27, 2004, issue of the journal by Woo et al (Circulation. 2004;109:1981–1986) titled “Effects of Diet and Exercise on Obesity-Related Vascular Dysfunction in Children.” The second letter (available at http://circ.ahajournals.org/cgi/content/full/110/12/e314), written by Tsung O. Cheng, should have been titled “Childhood Obesity Among the Chinese.” We regret this error.

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The article “Antibodies From Preeclamptic Patients Stimulate Increased Intracellular Ca\(^{2+}\) Mobilization Through Angiotensin Receptor Activation” by Thway et al, which appeared in the September 21, 2004, issue of the journal (Circulation. 2004;110:1612–1619), was inadvertently published without the authors’ corrections. The corrected version is available online at http://circ.ahajournals.org/cgi/content/full/110/12/1612. We regret these errors.

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In the article “Critical Role of Macrophage 12/15-Lipoxygenase for Atherosclerosis in Apolipoprotein E–Deficient Mice” by Huo et al that appeared in the October 5, 2004, issue of the journal (Circulation. 2004;110:2024–2031), an error appeared in the legend of Figure 4. The following sentences should have been deleted: d, Serum-free cell medium conditioned by 12/15-LO\(^{++}\) macrophages slightly increased endothelial VCAM-1 expression. e, In presence of LDL, 12/15-LO\(^{++}\) macrophages cocultured with endothelial cells significantly increased expression of VCAM-1 on endothelial cells. n=4.

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