nature medicine

Adding fat to the fire

The American Medical Association recently voted to recognize obesity as a disease. The potential implications of this resolution are manifold, but a better understanding of the underlying biology is necessary to help effect meaningful change.

At its annual meeting in Chicago on 17 June, the Council on Science and Public Health of the American Medical Association (AMA) released a report laying out the pros and cons of classifying obesity as a disease (http://www.ama-assn.org/resources/doc/csaph/a13csaph3.pdf). The report concluded that making such a designation is problematic for various reasons: for example, it is difficult to even define what a disease is, and the current metric used to define obesity—the body mass index (BMI)—may be an insufficient indicator of the condition. Furthermore, it is unclear whether the disease designation would improve health outcomes. These concerns were also voiced in a white paper written by an expert panel from the Obesity Society in 2008 (*Obesity* **16**, 1161–1177), though in that case they felt the potential benefits outweighed the drawbacks and supported labeling obesity as a disease.

Despite the reservations of the AMA Council, on 18 June the AMA's House of Delegates voted by a 60% majority to "recognize obesity as a disease state with multiple pathophysiological aspects requiring a range of interventions to advance obesity treatment and prevention" (http://www.ama-assn.org/assets/meeting/2013a/a13-addendum.pdf). Their declaration lists several reasons for this resolution, including the fact that other important bodies, such as the World Health Organization, the US Food and Drug Administration and the US National Institutes of Health, have already declared obesity a disease. Although the AMA may be a bit late to the party, its point of view can strongly influence physicians and best medical practices. Moreover, its advocacy initiatives have been known to affect decision-making by the government regarding issues of public health.

The numbers for obesity are certainly troubling. Obesity is defined as a BMI greater than 30 kg m^{-2}, and based on this metric, roughly one-third of adults in the United States are considered obese, with an estimated increase to 50% by 2040. Worldwide, over 500 million adults are obese. Obesity is associated with an increased risk of developing serious comorbidities, and it contributes to increased mortality and to higher healthcare spending. As a consequence, many feel there is a strong need to lower its incidence. To do so, some have argued that obesity should be declared a disease. They claim this would increase public awareness of the potentially adverse health implications of excessive weight and, therefore, place more pressure on governments to fund translational research programs focused on the condition, on insurance companies to pay for its treatment and on doctors to more aggressively treat their obese patients. It was also suggested that it

would remove the stigma of obesity, as studies have shown that there is a negative bias against obese people in the workplace, in education and in society in general. However, others have countered that 'medicalizing' obesity would put more emphasis on treating it by pharmacological and surgical means rather than on preventing it by promoting exercise and healthier eating habits. This could shift medical resources and actually raise overall medical costs. It could also increase the social stigma felt by obese individuals who are in good health.

The issues surrounding this debate are quite nuanced, and the AMA's resolution will not end the discussion. But while the controversy continues, further action can be taken now to develop more specific diagnostic criteria for obesity, which will probably require greater insight into the underlying biology.

As the AMA and other organizations have recognized, the use of BMI to diagnose obesity is potentially too limiting because it measures body mass and not selectively fat mass. Indeed, there are people who have a BMI >30 who are metabolically healthy, be it because they are heavily muscled or because they have a more healthy distribution of fat. This latter point may be important because several studies over the years have indicated that, in addition to higher levels of absolute fat mass, other factors may contribute to the increased risk for developing comorbidities, including the location of the fat (visceral versus subcutaneous), the type of fat (white fat versus brown fat) and its state of inflammation. Indeed, it has been argued that gaining fat mass in the face of overnutrition is actually a healthy process as this allows for the safe storage of excess nutrients that would otherwise be toxic to the body. But this appears to be true only if the fat is stored in an appropriate area. If it is extensively stored in the visceral fat (the fat around the organs of the midsection), it is more likely to be associated with a comorbidity, such as insulin resistance, hyperglycemia or dyslipidemia—all hallmarks of the metabolic syndrome. In fact, many individuals with a BMI in the normal range are insulin resistant or overtly diabetic, probably because of a mix of genetics and increased visceral adiposity.

In spite of great strides over the years, there is still much that needs to be learned about the biology of fat cells, the root causes of obesity and the variation in metabolic responses among individuals with similar amounts of fat mass. With such insight in hand, it may be possible to devise better tools to diagnose detrimental obesity and more efficacious ways to treat it, while also putting us on a firmer footing in classifying obesity as a disease.