

**Sylvia R. Karasu M.D.**

The Gravity of Weight

Weight: A Flu Shot in the Arm, A Shot in the Dark

Infection, the flu, and the immune response in obesity

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Flu season extends from October to May.

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As the weather becomes cooler and fall has begun, we are entering flu season that typically runs from October to May. Though there are a few contraindications, the flu shot is recommended for everyone older than 6 months of age, but particularly for the elderly, pregnant women, and the young who are most vulnerable, as well as for those with chronic diseases such as asthma, diabetes, or chronic lung disease. It takes two weeks after the shot for immunity to build up, and since the flu virus is constantly mutating (called “antigenic drift”), last year’s immunization is not effective against this year’s flu. Some hospitals

are asking their entire staff to be immunized.

The flu can be deadly. Anyone who wants a true page-turner about the horrific and devastating effects of the flu, not only on individuals afflicted but on societies worldwide, should read John M. Barry’s *The Great Influenza*, about the 1918 pandemic, published several years ago. The Center for Disease Control (CDC) reports that an estimated 20 to 50 million people worldwide died in that particular pandemic. In fact, the CDC is currently studying the genetic make-up of that 1918 strain since the biological properties that make one flu strain more virulent than another are still not well understood. For those interested in this research conducted by the CDC, visit its website, <http://www.cdc.gov/flu/about/qa/1918flupandemic.htm>.

Could another flu pandemic occur? Yes, of course, but it is not possible to predict when or even how it will start. The CDC believes, though, if it does, it will be caused by a subtype of influenza virus for which humans currently have little or no natural immunity. According to the CDC, “The single best way to protect against the flu is to get vaccinated each year.” According to its statistics for the years 1976 through 2007 (i.e., 31 flu seasons), the CDC estimates that from a low of 3000 to a high of 49,000 people in the United States alone have had flu-related deaths. About 90% of deaths have occurred in those older than 65 years, but even healthy people can develop serious cases of the flu. According to Sheridan and colleagues, 250,000 to 500,000 people die from influenza worldwide each year!



Flu shots remain the most effective means of preventing the flu.

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Where does obesity fit into this picture? Evidence has been gathering that the obese are, in general, more susceptible and vulnerable to infections, including an increase risk of sepsis, as well as respiratory and urinary tract infections, especially after surgery, and excess fat seems to have a negative impact on an obese person's general immune functioning. This becomes significant when the World Health Organization (WHO) reports that about 500 million adults and almost 43 million children below the age of 5 are considered in the obese range worldwide. Milner and Beck, in a recently published (2012) review article in the *Proceedings of the Nutrition Society*, “Obesity and

the Immune Response to Infection,” note that obese individuals, in general, are more likely to have longer stays in intensive care units and are even more likely to die in the hospital. Furthermore, they may even have different responses (e.g. poor antibody response) to vaccinations, such as tetanus and hepatitis B immunizations, as well as to treatment with antibiotics. Not only does this impact the obese individual, but may also have more general public health consequences in terms of the spread of disease. In fact, recent studies have indicated that obesity was found to be an independent risk factor for increased morbidity and even for greater mortality in the 2009 H1N1 flu pandemic. Milner and Beck believe more research is clearly needed but also believe that it is a “cause for major concern” that certain medications and vaccines “may not function as intended in obese individuals.” Researchers Louie and colleagues, writing in the journal, *Clinical Infectious Disease*, in 2011, found that 50% of those 534 in their California study who had been hospitalized during the 2009 H1N1 epidemic were obese, and those with extreme obesity (body mass index greater than 40 kg/m²) had increased odds of death. Their conclusion was that obese individuals “should be treated promptly” and given priority for both vaccine and antiviral medication when there are shortages.

Bottom line: along with all the other medical and psychological morbidities associated with obesity (e.g. diabetes, cardiac disease, certain cancers, sleep apnea, etc.), we can add that those who are obese may have less of an antibody response to the flu vaccine and may have increased morbidity and mortality if they get the flu. In other words, a shot in the arm may be a shot in the dark!

About the Author



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In Print: *The Gravity of Weight: A Clinical Guide to Weight Loss and Maintenance*

Online: my own website

