Metabolic Syndrome and Cardiovascular Disease: A Look at the Mechanism that Drives This Inflammatory Process

Part 1: Understanding the Metabolic Problem

by Gary Huber, DO, AOBEM

As a board-certified emergency medicine physician for 20 years, I have treated more acute MIs (myocardial infarctions) than I care to remember. The devastation that an ischemic event causes to the individual, the family, and the community at large is overwhelming. With today's new paradigm that cardiovascular disease is the result of inflammation, we can lay old myths aside and now realize a great opportunity to affect the course of inflammation and the direction of plaque formation and retard the progression of this disease long before the first chest pain is ever felt.

I propose a linear thought: that inflammation from any source follows a simple path of cytokine emergence to cardiovascular disease. Our lifestyle in this country has chronically been the source of inflammation even dating back to the time of the Korean war. In 1953 a study of our fallen soldiers revealed that upon autopsy, 77.3% of these young men (average age 22 years old) had gross evidence of coronary plaque.[1] Since then our use of wheat and its hybridization has only gotten worse, as Dr. William Davis reports in his book *Wheat Belly* that 20% of America's present caloric intake comes from wheat alone. Our American diet and lifestyle of stress and overcommitment continually contribute to inflammation as we watch metabolic syndrome rise at an alarming rate.

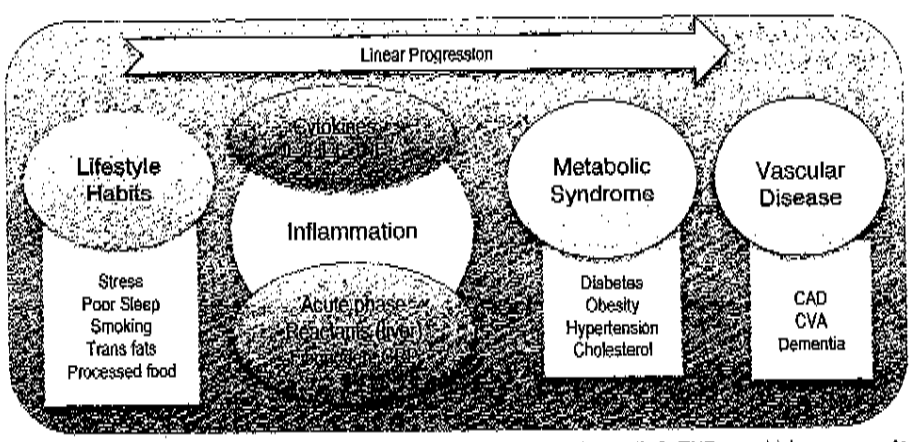
Metabolic syndrome now affects more than a third of all Americans. NHANES data report a rise in metabolic syndrome from 29% in 1994, to 34% in 2006. This is an age and weight related occurrence. Above age 40 you are 3 times more likely to meet criteria for metabolic syndrome. Overweight males increase their risk 6-fold and obese males have a 32-fold rise in risk. With 70% of the American population presently being overweight or obese, this represents a huge burden medically, financially, and emotionally.

There are ample data showing that metabolic syndrome is an inflammatory state that leads to MIs, stroke, and dementia. The mechanism is clear, as cytokine inflammation from multiple inflammatory triggers is generated from suboptimal lifestyle choices. This is an epigenetic phenomenon, and as such there are very real solutions that we can employ to divert this pathophysiology toward a healthful path, avoiding the all too common vascular insult.

Metabolic syndrome represents runaway inflammation with excess insulin production representing the first domino to fall in a chain reaction that results in eventual vascular plaque formation. Anything that reduces this process will ultimately reduce cardiovascular risk. So how do we define inflammation in this current age to aggressively reduce the occurrence of vascular disease?

As an integrative care physician, I offer this view:

1. Lifestyle choices provide the genesis of inflammation – food, sleep, stress, and so on generate inflammatory cytokines. Admittedly, this list of inflammatory etiologies could be endless (toxins, gum disease, allergies, etc.), but let us focus on these three common and primary movers.
2. Cytokine generation causes metabolic syndrome as a progressive disorder typically starting with insulin resistance.



Lifestyle choices, habits, and diet lead to inflammation in the form of IL-1, IL-6, TNF-α , which cause acute phase reactants such as fibrinogen and PAI-1, leading to endothelial dysfunction and cellular damage representing the end points of metabolic syndrome that over time lead to myocardial infarction, stroke, and general decay.

continued on page 55 ➤