Study deflates notion that pear-shaped bodies more healthy than apples

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People who are "apple-shaped"—with fat more concentrated around the abdomen—have long been considered more at risk for conditions such as heart disease and diabetes than those who are "pear-shaped" and carry weight more in the buttocks, hips and thighs.

But new research conducted at UC Davis Health System published in The *Journal of Clinical* Endocrinology and Metabolism provides further evidence that the protective benefits of having a pear-body shape may be more myth than reality. The journal article posted online January 10 and

will appear in the March 2013 print edition.

The UC Davis study found that fat stored in the buttock area—also known as gluteal adipose tissue—secretes abnormal levels of chemerin and omentin-1, proteins that can lead to inflammation and a prediabetic condition know as insulin resistance in individuals with early metabolic syndrome.

Metabolic syndrome refers to a group of risk factors that occur together, doubling the risk for heart disease and increasing the risk for diabetes at least five-fold. Risk factors include having a large waistline, low levels of high-density lipoproteins (HDL), or "good" cholesterol, high blood pressure as well as high fasting blood sugar (insulin resistance) and high triglyceride levels. According to the Centers for Disease Control and Prevention, metabolic syndrome affects 35 percent of American adults over age 20.

"Fat in the abdomen has long been considered the most detrimental to health, and gluteal fat was thought to protect against diabetes, heart disease and metabolic syndrome," said Ishwarlal Jialal, lead author of the study and a professor of pathology and laboratory medicine and of internal medicine at UC Davis. "But our research helps to dispel the myth that gluteal fat is 'innocent.' It also suggests that abnormal protein levels may be an early indicator to identify those at risk for developing metabolic syndrome."

The UC Davis team found that in individuals with early metabolic syndrome, gluteal fat secreted elevated levels of chemerin and low levels of omentin-1—proteins that correlate with other factors known to increase the risk for heart disease and diabetes. High chemerin levels, for example, correlated with high blood pressure, elevated levels of C-reactive protein (a sign of inflammation) and triglycerides, insulin resistance, and low levels of HDL cholesterol. Low omentin-1 levels

correlated with high levels of triglycerides and blood glucose levels and low levels of HDL cholesterol.

"High chemerin levels correlated with four of the five characteristics of metabolic syndrome and may be a promising biomarker for metabolic syndrome," said Jialal. "As it's also an indicator of inflammation and insulin resistance, it could also emerge as part of a biomarker panel to define high-risk obesity states. The good news is that with weight loss, you can reduce chemerin levels along with the risk for metabolic syndrome."

To conduct the study, Jialal and colleagues recruited 45 patients with early metabolic syndrome—defined as having at least three risk factors for metabolic syndrome including central obesity, hypertension, mild increases in glucose levels not yet in the diabetic range (