

Living Donors with Metabolic Syndrome

Author: S. Taler, MD

Editor: D. Lapointe Rudow, DNP

ISSUE

What are the requirements and concerns for a potential kidney donor with metabolic syndrome?

DATA

Metabolic syndrome as defined by the National Cholesterol Education Program ATP III criteria is the combination of multiple metabolic abnormalities that increase risk for cardiovascular events (Table).¹ As waist circumference is often not recorded, many centers substitute body mass index (BMI) as a measure of obesity. Whether each metabolic trait should only be considered as an individual risk factor or whether to consider the potential added risk of the combination is debated, and may vary by center. The prevalence of obesity has increased in living donors over the past 4 decades and a subset have other cardiovascular abnormalities.² Individuals with multiple cardiovascular risk factors may be considered at too high risk either in the short term regarding the period around the surgery, or in the longer term for cardiovascular or kidney disease and may therefore be excluded from donation.

As metabolic syndrome is a marker for obesity and associated problems including glucose intolerance and elevated blood pressure, there is concern that potential donors with metabolic syndrome are at greater risk for developing type 2 diabetes mellitus and diabetic kidney disease. Further, metabolic syndrome is a risk factor for future cardiovascular disease, which may require invasive treatments that carry risk of reducing kidney function. Many features of metabolic syndrome can be reversed by lifestyle modification thereby lowering these risks.

A potential kidney donor with the metabolic syndrome will be advised to institute lifestyle changes to reverse their multiple risk factors including elevated fasting glucose (greater than 100 to 110 mg/dL depending on the center), obesity, hypertriglyceridemia and elevated blood pressure by a combination of lifestyle changes including diet and exercise. It is important to emphasize the need to adopt changes that will be incorporated for the long term. A decision on donor candidacy would depend on their ability to address multiple factors and the policy of the center. Of note, no lipid abnormalities have been shown to directly increase the risk of kidney disease (Grams NEJM 2015).

RECOMMENDATION

1. A potential donor with features of metabolic syndrome may be at higher risk for developing diabetes or cardiovascular disease than a donor without these features.
2. Programs should carefully evaluate potential donors with multiple metabolic abnormalities as they may be at risk for cardiovascular complications at the time of or after donor surgery as well as possibly greater risk for kidney disease.³ If that risk is felt to be too high, the donor should be excluded from donation.

Table: Constituents of the metabolic syndrome (requires the presence of 3 or more of the following characteristics)¹

Risk Factor	Level
Abdominal obesity (waist circumference)	Men >102 cm (.40 in) Women >88 cm (.35 in)
Triglycerides	≥150 mg/dL
High-density lipoprotein cholesterol	Men <40 mg/dL Women <50 mg/dL
Blood pressure	≥130 systolic or ≥85 mm Hg diastolic
Fasting glucose	≥110 mg/dL

References

1. Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). *JAMA* 2001; 285, 19: 2486-2497.
2. Taler SJ, Messersmith EE, Leichtman AB, Gillespie BW, Kew CE, Stegall MD, Merion RM, Matas AJ, Ibrahim HN for the RELIVE Study Group. Demographic, Metabolic, and Blood Pressure Characteristics of Living Kidney Donors Spanning Five Decades. *AJ Transplantation* 2013; 13: 390–398. doi: 10.1111/j.1600-6143.2012.04321.x
3. UNOS donor evaluation policy accessed at http://optn.transplant.hrsa.gov/ContentDocuments/OPTN_Policies.pdf#nameddest=Policy_14

Note: The recommendations in these chapters are the opinions of the Living Donor Community of Practice of AST. They are not meant to be prescriptive and opinions by other groups or institutions may be equally valid.