

### Transcript Details

This is a transcript of an educational program. Details about the program and additional media formats for the program are accessible by visiting: <https://reachmd.com/programs/project-oncology/the-impact-of-a-plant-based-diet-on-multiple-myeloma-prevention-and-progression/30048/>

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## The Impact of a Plant-Based Diet on Multiple Myeloma Prevention and Progression

### Announcer:

You're listening to *Project Oncology* on ReachMD. On this episode, we'll learn about how a plant-based diet may delay the progression of multiple myeloma from Dr. Urvi Shah. Dr. Shah is an Assistant Attending Physician of Myeloma Service as well as a hematologist and oncologist at Memorial Sloan Kettering Cancer Center. Let's hear from her now.

### Dr. Shah:

A common question asked by patients often is "Does diet play a role in cancer?" and we decided to study this in the setting of multiple myeloma and understand its role. When we look at epidemiologic studies—that is population studies—we do see that individuals who eat more plant foods tend to have lower risk to develop myeloma in the EPIC-Oxford study, in the NIH-AARP study, and also in the NHIN study for MGUS, and we published some of these findings.

And given these epidemiologic associations as well as the association of obesity as a risk factor for myeloma, we decided to study this in the prevention and survivorship spaces. In the prevention setting, we conducted a dietary interventional study called the NUTRIVENTION trial, which looked at a high fiber plant-based diet in patients with the precursor plasma cell disorders MGUS, or monoclonal gammopathy, and smoldering myeloma, and we gave them three months of a high fiber plant-based diet, six months of nutrition coaching, and followed them for a year. These were patients with a BMI over 25. What we did see was we improved weight, BMI, and then other biomarkers, such as insulin resistance, gut microbiome diversity, inflammation, and immune subsets, suggesting that a dietary change could lead to significant changes in weight, quality of life, and correlated markers, such as microbiome and immune changes and insulin resistance. Given these findings, we also looked at the trajectory of M-spike changes, and in this pilot study of 20 patients, we did see two patients with clearly rising M-spike before going on the study have a slowing of progression as a rate of change of progression before or after the intervention, suggesting that a high fiber plant-based diet may delay progression.

In the survivorship setting, we have done a study looking at patients who are on lenalidomide maintenance therapy and compared patients who were sustained MRD negative compared to those who are MRD positive and looked at the microbiome. What we do see is that patients who are sustained MRD negative are more likely to have better gut microbiome diversity, more butyrate producers, and more stool butyrate concentrations. Additionally, we correlated this with dietary patterns and see that dietary flavonoids, which are present in plant foods and have anti-cancer and anti-inflammatory properties, and also healthier proteins, like plant proteins and seafood protein, may be associated with these microbiome changes, suggesting that diet may be modulating the microbiome, which in turn modulates a response to therapy long term—although this is a retrospective observational or association study and not an interventional.

Given all of this data and just knowing the overall benefits of plant-forward diets for cardiovascular disease, diabetes, and obesity—things that our patients with myeloma or cancer often deal with—we see the evidence for why it may be beneficial for patients to consider increasing fiber and plant food intake.

So when we think about a plant-based diet and the mechanisms around which it may be associated with slowing progression to myeloma, there are multiple different mechanisms that come into play. One of them is through the weight changes. So people who eat more plant foods and fiber-ish foods tend to have a lower BMI and move towards a more normal BMI than being overweight or obese, so that's one mechanism: by reduction in weight. Along with reduction in weight, there is improvement in insulin resistance, so lower insulin fasting levels and also adiponectin-to-leptin ratio, a marker of insulin resistance, the less insulin resistance; that improves as well.

Other mechanisms are flavonoids, as we spoke about previously, and all of these mechanisms affect the immune system. So we saw a

reduction in C-reactive protein levels. In the patients that it was elevated, it dropped to half in the study. We also saw a change in immune subsets where inflammatory monocytes, such as the nonclassical, reduced and the classical or anti-inflammatory monocytes increased. There was a reduction in the neutrophil count too, suggesting less inflammation and circulating neutrophils. And then when we looked at the bone marrow of patients paired bone marrow single-cell RNA sequencing from baseline and one year, we see a shift again of an increase in the classical monocytes as well as an increase in granulocyte and monocyte progenitor, suggesting enhanced immune potential, but these neutrophils aren't circulating since there is less inflammation.

Lastly, when we do exploratory analysis, we do see associations between interactions of the myeloid cells with cytotoxic CD8 cells and natural killer cells at the end of intervention compared to interaction more with the exhausted CD8 T-cells at baseline, again suggesting a shift in the function of the immune system.

**Announcer:**

That was Dr. Urvi Shah discussing the impact of a plant-based diet on the progression of multiple myeloma. To access this and other episodes in our series, visit *Project Oncology* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!