What Are the MPNs?

Recorded on April 19, 2014

Bart Scott, MD
Director, Hematology and Hematologic Malignancies
Seattle Cancer Care Alliance

David S. Snyder, MD
Associate Chair, Hematology and Hematopoietic Cell Transplantation
City of Hope

Andrew Schorr:
So here, we can see three illnesses. So, Dr. Scott, why don't we start with you? What's going on when you have ET? What's going on when you have PV? What's going on? How are they related, but how are they different?

Dr. Scott:
So instead of thinking of these diseases as separate boxes, I like to think of them as more of a Venn diagram, where there's some overlap between them. And many of the bone marrow failure disorders have overlap with them. These groups of diseases are known as MPN, myeloproliferative neoplasms.

And then, there's MDS, which stands for myelodysplastic syndromes. And the MPNs basically have high cell count numbers, whereas MDS has low cell count numbers. There's also something called the MDS MPN overlap, where you can have some numbers that are high and some numbers that are low.

So, I think from a patient's perspective, it can be confusing. For me, I think of it as a Venn diagram. There's a lot of overlap between these and they all share in common bone marrow disorder, so you either are making too much or too little and pro-inflammation, so there are a lot of inflammatory cytokines in these types of disorders.

And one of the messages that I like to send to patients, that it's not just a disease of numbers. There are a lot of inflammatory symptoms that are associated with all of these. The thrombosis, the clotting that people get, like you have the DVT, does have an inflammatory component to it.

The weight loss, the night sweats that people experience, the extreme fatigue, it's not just due to anemia. It's also due to the increased inflammation. In regards to the specific category of MPN, the diagnosis is hierarchical, and you kind of go through these stages in how you would diagnose someone as having one of these disorders.

But immediately, the first thing you think of is CML, which is chronic myeloid leukemia, and as a physician, we would do a blood test to see if they have that or not. We have a very good blood test for that.

It's called the BCR-ABL oncogene, and the myeloproliferative neoplasms are actually split into those patients who are Philadelphia-positive., that's the BCR-ABL-positive, and those patients who are Philadelphia-negative. The ones you have listed here, these three, are the Philadelphia-negative ones.

And then, you would basically see if the patient has PV. If not, you would see if they have ET and if not, then you would see if they have myelofibrosis. Not all patients with this need to have a bone marrow done.

So for PV, it's not required that you have a bone marrow done, but PV patients are almost always, not always, but almost always positive for the JAK2 V617F mutation. About 95 to 97 percent of these patients are positive, and the problem with PV is you make too many red cells.

With ET, about 60 percent are positive for this JAK2 V617F mutation, which I assume we'll talk about that later, about what that is.

Andrew Schorr:
We will.

Dr. Scott:
And then, myelofibrosis, about 50 percent are positive for the JAK2 V617F mutations, so you can't use being positive for the JAK2 V617F to try to distinguish between these. But PV is basically making too many red cells. ET is making, basically, too many platelets and myelofibrosis is basically making too much scar tissue in your bone marrow. So they're all kind of more proliferative, making too much of something.

Andrew Schorr:
But does one tend to be more common than another, Dr. Snyder, more often, just the incidence?

Dr. Snyder:
Well, the ET and PV are a little more common than myelofibrosis, at least primary myelofibrosis. We talked about how patients first present and also talked about how things can kind of morph into each other. So ET and P. vera are a little more common than primary myelofibrosis.

But over time, one of the things that can happen is that ET and P. vera can transform into what we call secondary myelofibrosis, so that becomes, you know, a little more common than primary.

Andrew Schorr:
Right, and that's what happened to Michael. After many years, it transformed. So I have primary myelofibrosis. I didn't have any of those that we know of before. So that's primary myelofibrosis.

Dr. Snyder:
Right.