What Are Myelodysplastic Syndromes?

Myelodysplastic syndromes (MDS) are a rare group of closely related but diverse blood cancers. In MDS, the cells that give rise to red blood cells (RBCs), white blood cells (WBCs) and/or platelets fail to develop normally, resulting in the production of too few mature or defective RBCs. Anemia, resulting from immature RBCs, occurs in the majority of patients, often leading to transfusion dependence. MDS is most commonly diagnosed in people in their 70s. The annual incidence of MDS is estimated to be 4.9 cases per 100,000 people worldwide. MDS is likely to become more prevalent in the future, based on refinement of the definition of MDS, improvements in early diagnosis, and population aging.

Causes and Risk Factors

The exact cause of MDS is unknown in most instances; this is known as primary MDS. Cases of MDS triggered by previous therapies are called secondary MDS.

Some of the risk factors for MDS include:
- Older age
- Previous chemotherapy or radiation therapy
- Chemical exposure to benzene and certain pesticides
- Genetic changes inside bone marrow cells, including deletions or abnormal chromosomes

Symptoms and Diagnosis

Diagnosis of MDS involves a series of evaluations to:
- Rule out other causes of blood cell deficiencies
- Identify the sub-type of MDS
- Determine prognosis
- Define an appropriate treatment plan

Symptoms differ depending on the type of MDS and which blood cell type is predominantly affected and may include:
- Anemia (too few RBCs) leads to fatigue, pallor, shortness of breath, dizziness
- Neutropenia (too few WBCs) leads to frequent infections, which can be severe
- Thrombocytopenia (too few platelets) leads to bruising, excessive/abnormal bleeding (nose bleeds), petechiae (tiny, rash-like bruises on the skin)

These symptoms can be life-threatening. Many patients experience severe chronic anemia, requiring frequent RBC-transfusions. Frequent transfusions are associated with an increased risk of iron overload, transfusion reactions and infections, as well as an increased risk of morbidity and mortality. The majority of MDS patients die from complications of low blood cell counts, including bleeding or infections.
Prognosis

Prognosis is determined following an assessment of the proportion of blasts (immature blood cells) in the bone marrow, the number of cell types affected, any changes in chromosomes and a patient’s need for transfusions.\textsuperscript{12}

The most severe forms of MDS are associated with survival times of less than two years.\textsuperscript{2} Some patients may also progress from MDS to AML—a dangerous form of blood cancer that is difficult to treat and has a low survival rate.\textsuperscript{2}

Treatment\textsuperscript{1,8}

Because MDS tends to be a disease of older people who may present with comorbidities, treatment approaches take into account a variety of patient characteristics, such as:

- Type of MDS
- Risk level
- Age
- Overall health
- Preferences
- Potential medication side effects