Risk Factors for Myelodysplastic Syndromes

- Older age
- Sex
- Cancer treatment
- Genetic syndromes
- Familial MDS
- Smoking
- Environmental exposures

- Chlorambucil
- Cyclophosphamide
- Ifosfamide
- Etoposide
- Teniposide
- Doxorubicin

The risk of secondary MDS varies based on the type and doses of drugs. It might also be affected by the type of cancer the chemo is treating. Combining these drugs with radiation therapy[2] increases the risk further. People who have had stem cell transplants[3] (bone marrow transplants) can also develop MDS because of the very high doses of chemo they received. Still, only a small percentage of people who are treated with these medicines will eventually develop MDS.

Genetic syndromes

People with certain inherited syndromes are more likely to develop MDS. These syndromes are caused by abnormal (mutated) genes that have been passed on from one or both parents. Examples include:

direct contact with smoke. Cancer-causing substances in tobacco smoke[5] are absorbed into the blood as it passes through the lungs. Once in the bloodstream, these substances spread to many parts of the body.

Environmental exposures

Some environmental exposures have been linked to MDS:

- High-dose radiation exposure[6] (such as surviving an atomic bomb blast or nuclear reactor accident) increases the risk of developing MDS.
- Long-term workplace exposure to benzene[7] and certain chemicals used in the petroleum and rubber industries can also increase the risk of developing MDS.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/treatment-types/chemotherapy.html
2. www.cancer.org/cancer/managing-cancer/treatment-types/radiation.html

What Causes Myelodysplastic Syndromes?

include those in the *DNMT3A*, *TET2*, *ASXL1*, *TP53*, *RUNX1*, *SRSF2*, and *SF3B1* genes. Some of these gene changes can be inherited from a parent, but more often they happen during a person's lifetime.

Inherited gene changes

Researchers have found the gene changes that cause some rare inherited syndromes (like familial platelet disorder with a propensity to myeloid malignancy) linked to an increased risk of developing MDS. This syndrome is caused by inherited changes in the *RUNX1* gene. Normally, this gene helps control the development of blood cells. Changes in this gene can lead to blood cells not maturing like they normally would, which can increase the risk of developing MDS.

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Can Myelodysplastic Syndromes Be Prevented?

- Not smoking
- Avoiding exposure to radiation or certain chemicals

There is no sure way to prevent myelodysplastic syndromes (MDS). But there are things you can do that might lower your risk.

Not smoking

Since smoking[1] is linked to an increased risk of MDS, not smoking can lower the risk. Of course, people who don't smoke are also less likely than people who smoke to develop many other types of cancers, as well as heart disease, stroke, and other re f 0 g Q BT 1 0 0 1 95.35 2

drugs. Often, the obvious benefits of treating life-threatening cancers with chemo and radiation therapy must be balanced against the small chance of developing MDS several years later.

Hyperlinks

1. www.cancer.org/cancer/risk-prevention/tobacco.html
2. www.cancer.org/cancer/risk-prevention/chemicals/benzene.html

References

Komrokji RS, Padron E, List AF. Chapter 111: Myelodysplastic syndromes. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

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