# *Essential Thrombocythemia*

Essential thrombocythemia (ET) is a chronic blood malignancy characterized by an abnormally high number of platelets in the blood. The increase in platelets can cause abnormal blood clotting in blood vessels and bleeding, and in late stages can progress to myelofibrosis (fibrous tissue build up in the bone marrow) or acute leukemia. ET is one of a group of rare blood cancers called myeloproliferative neoplasms (MPNs) that develop due to an acquired gene mutation in the bone marrow stem cells.

**Statistics**

- JAK2 (V617F) (Janus kinase) gene mutations occur in about 60 percent of essential thrombocythemia patients.
- Calreticulin (CALR) mutations occur in approximately 25 percent of patients and MPL mutations occur in approximately 10 percent of patients. Four to five percent are "triple negative," meaning they do not have any of these gene mutations.
- The incidence of ET in the U.S. is approximately 0.38 to 1.7 in every 100,000 people.

**Risk Factors**

The exact causes of the acquired genetic mutation as seen in ET are not yet known. Other risk factors may include:

- **Gender:** Women are one and a half times more likely to develop essential thrombocythemia than men.
- **Age:** A majority of patients diagnosed with ET are older than 60. Approximately one in five patients is under age 40.
- **Gene Mutations:** The JAK2 gene is most often mutated at V617F, followed in frequency by CALR and MPL mutations.
- **Blood Clotting:** Blood clotting is more common if JAC2 (V617F) is mutated.

**Symptoms**

Many patients with ET do not have symptoms when they are diagnosed. Diagnoses often occur during a routine exam or blood test. However, some patients may experience persistent symptoms, including the following:

- Fatigue
- Migraines
- Visual or hearing disturbances
- Dizziness
- Coldness, blueness, or pain in the fingers or toes
- Burning, redness, throbbing, and pain in the hands and feet
- Tingling
- Stroke
- Transient ischemic attack (TIA)
- Heart attack
- Deep vein thrombosis
- Pulmonary embolus (blood clot in lung)
- Easy bruising
- Numbness or weakness on one side of the body
- Abnormal bleeding such as nosebleeds, heavy menses, blood in urine, gastrointestinal bleeding
- Night sweats
- Discomfort in upper left side of abdomen, caused by an enlarged spleen, occasionally with loss of appetite
- Unusual sites of blood clotting, such as veins inside the abdomen
- Weakness
- Fainting
- Weight loss
- Chest pain

**Prevention**

ET cannot be prevented. Research is underway to learn more about how the disease develops.

**Treatment**

ET patients who do not experience symptoms, are younger, and without cardiovascular comorbidities may not need active treatment other than monitoring. However, if symptoms are present or the patient has high risk features, (age greater than 60, prior blood clots, or positive JACK 2-F) treatment may be needed. Treatment options include low-dose aspirin and other medications such as hydroxyurea, ruxolitinib, anagrelide, and interferon. Clinical trials can also be an important treatment option.

*Sources: Leukemia and Lymphoma Society, MPN Research Foundation, and National Cancer Institute*

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