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Change of the 2008/16 WHO into 2018 clinical, laboratory, molecular and pathobiological (WHO-CLMP) criteria for diagnosis of the meloproliferative neoplasms JAK2^{V617F} trilinear polycythemia vera (PV), JAK2 exon 12 PV and JAK2^{V617F}, CALR or MPL^{515} mutated thrombocythemias and secondary myelofibrosis

The JAK2^{V617F} mutated trilinear myeloproliferative neoplasms include a broad spectrum of clinical laboratory and bone marrow features in essential thrombocythemia, prodromal polycythemia vera and erythrocythemic PV, classical PV and advanced stages of masked PV and PV complicated by splenomegaly and secondary myelofibrosis. Heterozygous JAK2^{V617F} mutated ET is associated with low JAK2 allele and MPN disease burden and normal life expectance. In combined heterozygous and homozygous or homozygous JAK2^{V617F} mutated trilinear MPN, the JAK2 mutation load increases from less than 50% in prodromal and early stage PV to above 50% up to 100% in classical PV, advanced PV and PV with MF. Bone marrow histology features show various degrees of diagnostic erythrocytic, megakaryocytic and granulocytic myeloproliferation in JAK2^{V617F} mutated trilinear MPN clearly differ from monolinear megakaryocyticor dual megakaryocytic granulocytic myeloproliferation in MPL or calreticulin mutated thrombocythemia without features of PV. The morphology of clustered large pleomorphic megakaryocytes with hyperlobulated nuclei are similar in JAK2^{V67F} thrombocythemia, prodromal PV and classical PV patients. Monolinear megakaryocytic myeloproliferation of large to giant megakaryocytes with hyperlobulated staghorn like nuclei is the hallmark of MPL^{515} mutated normocellular thrombocythemia. CALR mutated thrombocythemia usually presents with high platelet count around 1000x109/l and normocellular megakaryocytic proliferation of immature megakaryocytes with cloud-like hyperchromatic nuclei followed by dual megakaryocytic granulocytic myeloproliferation followed by various degrees of bone marrow fibrosis. Natural history and life expectancy of MPN patients are related to the response to treatment and the degree of anemia, splenomegaly, myelofibrosis and constitutional symptoms. The acquisition of epigenetic mutations at increasing age on top of MPN disease burden independently predict unfavorable outcome in JAK2^{V617F}, MPL515 and CALR mutated myeloproliferative neoplasms, which mutually exclude each other.

Speaker Biography

Jan Jacques Michiels is a Lifestyle Physician and Medical Doctor, educated in Internal Medicine, Hematology, blood coagulation and Vascular Medicine and graduated as PhD at the Erasmus University Medical Center, Rotterdam. He frequently served as Guest Editor and was the Founder and Editor in Chief of Seminars in Vascular Medicine. He is the Founder of the Thrombocythemia Vera Study Group, the European Working Group on Myeloproliferative Disorders and Myeloproliferative Neoplasms as scientific working groups of the European Hematology Association. He is the founder of the Goodheart Institute & Foundation in Nature Medicine & Health, Rotterdam, The Netherlands.

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