ELN European LeukemiaNet

2014

Diagnosis and treatment of primary myelodysplastic syndromes (MDS) in adults. Recommendations from the European LeukemiaNet[1]

Diagnostic approach to MDS

Diagnostic tool	Diagnostic value	Priority
Peripheral blood smear	• Evaluation of dysplasia in one or more cell lines • Blast count	Mandatory
Bone marrow aspirate	• Evaluation of dysplasia in one or more hematopoietic cell lines • Blast count • Quantification of ring sideroblasts	Mandatory
Bone marrow biopsy	• Assessment of cellularity, CD34+ cells, and fibrosis	Mandatory
Cytogenetic analysis	• Detection of acquired clonal chromosomal abnormalities that can allow a conclusive diagnosis and also prognostic assessment	Mandatory
FISH	• Detection of targeted chromosomal abnormalities in interphase nuclei following repeated failure of standard G-banding	Recommended
Flow cytometry immunophenotyping*	• Detection of abnormalities in erythroid, immature myeloid, maturing granulocyte, monocyte, immature and mature lymphoid compartments	Recommended
SNP-array	• Detection of chromosomal defects at a high resolution in combination with metaphase cytogenetics	Suggested
Mutation analysis of candidate genes	• Detection of somatic mutations that can allow a conclusive diagnosis and also reliable prognostic evaluation	Suggested

*Standard methods from the International Flow Cytometry Working Group of the European Leukemia Network are recommended [2].

International Prognostic Scoring System (IPSS) for MDS[3]

Variable	Points				
	0	0.5	1	1.5	2
Marrow blasts (%)	<5	5 - 10		11 - 20	21 - 30
Karyotype†	good	intermediate	poor		
Cytopenias‡	0 or 1	2 or 3			

IPSS risk group	Score
Low	0
Intermediate 1	0.5 - 1.0
Intermediate 2	1.5 - 2.0
High	2.5 - 3.5

†Good: normal, del(5q) only, del(20q) only, –Y only; Poor: very complex (>2) abnormalities, chromosome 7 anomalies; Intermediate: other abnormalities.
‡Cytopenias: hemoglobin <10 g/dL, neutrophil count < 1.5 x 10^9/L, platelet count < 100 x 10^9/L.

Therapeutic algorithm for adult patients with primary MDS and ...

... low IPSS score.

Low IPSS risk	Asymptomatic cytopenia			Watchful-waiting
	Symptomatic anemia	sEPO <500 mU/mL and/or RBC transfusion <2 U/month		rHuEPO +/- G-CSF
		MDS del(5q)	sEPO <500 mU/mL and/or RBC transfusion <2 U/month	rHuEPO +/- G-CSF
			sEPO >500 mU/mL and RBC transfusion ≥2 U/month	Lenalidomide *(within prospective registry)*
		Age <60 years, BM blasts <5%, normal cytogenetics, transfusion-dependency (hypocellular bone marrow)		Immunosupressive therapy with ATG plus CSA
				RBC transfusion and iron chelation therapy

... intermediate-1 IPSS score.

Intermediate-1 IPSS risk	BM blasts <5%, no poor risk cytogenetics, asymptomatic cytopenia			Watchful-waiting
	Symptomatic anemia	sEPO <500 mU/mL and/or RBC transfusion <2 U/month		rHuEPO +/- G-CSF
		MDS del(5q)	sEPO <500 mU/mL and/or RBC transfusion <2 U/month	rHuEPO +/- G-CSF
			sEPO >500 mU/mL and RBC transfusion ≥2 U/month	Lenalidomide *(within clinical trial or prospective registry)*
		Age <60 years, BM blasts <5%, normal cytogenetics, transfusion-dependency (hypocellular bone marrow)		Immunosupressive therapy with ATG plus CSA
				RBC transfusion and iron chelation therapy
	BM blasts >5% or poor risk cytogenetics	Available stem cell donor		Allo-SCT

... intermediate-2 or high IPSS score.

Intermediate-2 or high IPSS risk	Age >65-70 years or poor performance status			Supportive care	
				Azacitidine	
	<65-70 years and good performance status	No suitable stem cell donor	Poor risk cytogenetics	Azacitidine	
			>10% BM blasts No poor risk cytogenetics	AML-like CT OR Azacitidine	
		Available stem cell donor	<10% BM blasts	Allo-SCT	
			>10% BM blasts	AML-like CT OR Azacitidine *(within clinical trial or prospective registry)*	Allo-SCT

Abbreviations: CT = chemotherapy, SCT = stem cell transplantation, BM = bone marrow, CSA = Cyclosporine A

References

1. Malcovati L, Hellström-Lindberg E, Bowen D et al. Diagnosis and treatment of primary myelodysplastic syndromes in adults: recommendations from the European LeukemiaNet. Blood 2013;122:2943-64.

2. Westers TM, Ireland R, Kern W et al. Standardization of flow cytometry in myelodysplastic syndromes: a report from an international consortium and the European LeukemiaNet Working Group. Leukemia 2012;26:1730-41.

3. Greenberg P, Cox C, LeBeau MM et al. International scoring system for evaluating prognosis in myelodysplastic syndromes. Blood 1997;89:2079-88.