UPDATE ON MYELODYSPLASTIC SYNDROME

An Essay
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By

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بسم الله الرحمن الرحيم

﴿قَالُوا سُبْحَانَكَ لا عِلْمَ
لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ
أَنتَ الْعَلِيمُ الْحَكِيمُ﴾

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List of Abbreviations

AA	APLASTIC ANEMIA
AIHA	AUTOIMMUNE HEMOLYTIC ANEMIA
ALIPs	ABNORMAL LOCALIZATION OF IMMATURE PRECURSORS
ALL	ACUTE LYMPHOBLASTIC LEUKAEMIA
AML	ACUTE MYELOID LEUKEMIA
CDS	COMMONLY DELETED SEGMENTS
CML	CHRONIC MYELOGENOUS LEUKEMIA
CMML	CHRONIC MYELOMONOCYTIC LEUKEMIA
CMV	CYTOMEGALOVIRUS
EPO	ERYTHROPOIETIN
FAB	FRENCH-AMERICAN-BRITISH
FEP	FREE ERYTHROCYTE PROTOPORPHYRIN
FISH	FLUORESCENCE IN SITU HYBRIDIZATION
G-CSF	GRANULOCYTE COLONY STIMULATING FACTOR
GEP	GENE EXPRESSION PROFILING
GM-CSF	GRANULOCYTE MACROPHAGE COLONY STIMULATING FACTOR
HLA	HUMAN LEUKOCYTE ANTIGEN
HUMARA	HUMAN ANDROGEN RECEPTOR ASSAY
IHC	IMMUNOHISTOCHEMISTRY
IPSS	INTERNATIONAL PROGNOSIS SCORING SYSTEM
LDH	LACTATE DEHYDROGENASE
JMML	JUVENILE MYELOMONOCYTIC LEUKEMIA
MDS	MYELODYSPLASTIC SYNDROME
MDS/MPD	MYELODYSPLASTIC SYNDROME/MYELOPROLIFERATIVE DISORDER
M:E	MYELOID-TO-ERYTHROID RATIO
MFISH	MULTICOLOR FLUORESCENCE IN SITU HYBRIDIZATION
MGUS	MONOCLONAL GAMMOPATHY OF UNKNOWN SIGNICIFANCE
MIC	MORPHOLOGIC-IMMUNOLOGIC-CYTOGENETIC STUDY GROUP
MPD	MYELOPROLIFERATIVE DISORDER
PCR	POLYMERASE CHAIN REACTION
PNH	PAROXYSMAL NOCTURNAL HEMOGLOBINOPATHY
PRCA	PURE RED CELL APLASIA
RA	REFRACTORY ANEMIA
RAEB	REFRACTORY ANEMIA WITH EXCESS BLASTS
RAEB-T	REFRACTORY ANEMIA WITH EXCESS BLASTS IN TRANSFORMATION
RARS	REFRACTORY ANEMIA WITH RINGED SIDEROBLASTS
RCMD	REFRACTORY CYTOPENIA WITH MULTILINEAGE DYSPLASIA
RCMD-RS	REFRACTORY CYTOPENIA WITH MULTILINEAGE DYSPLASIA WITH RINGED SIDEROBLASTS
t-MDS	THERAPY-RELATED MDS
u-MDS	UNCLASSIFIABLE MDS
WHO	WORLD HEALTH ORGANIZATION

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INTRODUCTION

Myelodysplastic syndrome (MDS) comprises a group of clonal hematologic disorders characterized clinically and morphologically by ineffective hematopoiesis. The natural history of this syndrome ranges from a chronic course that may span years to a rapid course of leukemic progression ***(Shadduck et al., 2007).***

Unfortunately, the nomenclature and classification systems used to describe these conditions are cumbersome and contentious. Nonetheless, MDS are viewed by most hematologists as encompassing stages of neoplastic hematopoiesis associated with cytopenias and as excluding nonneoplastic conditions. In general, myelodysplastic conditions are preleukemic disorders in which the neoplastic clone is established, but not all cases of myelodysplasia terminate in acute myeloid leukemia (AML) ***(Heaney and Golde, 1999).***

Neoplastic transformation of hematopoietic cells can occur at various levels of stem-cell development ***(Mueller et al., 2003).***

The initial hematopoietic stem cell injury can result from cytotoxic chemotherapy, radiation exposure, viral infection, chemical exposure, or genetic predisposition. A clonal mutation predominates over bone marrow suppressing healthy stem cells ***(Cheson et al, 2000).***

A thorough diagnostic evaluation is a prerequisite for therapeutic decision-making. Parallel use of the older French-American-British (FAB) and the newer World Health Organization (WHO) classifications is helpful in evaluating patients with MDS ***(Deeg, 2005).***

Cytogenetic studies have revealed both balanced chromosomal abnormalities leading to the generation of fusion oncogenes and unbalanced recurrent aberrations, most commonly –5, 5q–, –7, 7q–, +8, 11q–, 13q– and 20q– suggesting that genes within these regions have a role in MDS pathogenesis ***(Look, 2005).***

The decision about how to deal with the morbidity of the disease versus the potential benefits and toxicities from treatment will ultimately be made by the individual patient. This decision is based on age, personal preferences, and available information about

disease biology and prognostic factors ***(Hellström-Lindberg, 2005).***

Aim of the work

The aim of the present work is to review recent advances in myelodysplastic syndrome as regard molecular pathogenesis, diagnosis, classification and treatment.