4.5% of patients (205). The TP53 gene is located on chromosome 17p13.1 (206). This gene encodes a transcription factor known as p53.

The following introduces the biology of p53 and of p53 mutations. The p53 protein is a tumor suppressor protein. This protein normally blocks tumor formation by triggering apoptosis (207). But various kinds of tumors encode a mutated p53 that prevents p53 from binding to DNA, prevents p53 from regulating target genes, and allows tumor formation. Mutations in p53 occur in a great variety of cancers, including cancer of the breast, head and neck, liver, bladder, brain, lung. colorectum, esophagus, ovary, and hematopoietic and lymphoid systems (208). Mutations in p53 frequently occur at six discrete hotspot codons within the DNA binding domain of the molecule, namely, at codons 175, 245, 248, 249, 273, and 282 (209). Where mutations occur, the strongest correlations between poor prognosis have been found mainly for breast cancer and chronic lymphocytic leukemia (CLL) (210). But convincing correlations have not been found, for example, in the case of colorectal cancer.

f. Cytogenetics for diagnosis and prediction – myelodysplastic syndromes

Chromosomal abnormalities are detected in about 50% of patients with de novo MDS and in up to 80% of patients with MDS secondary to chemotherapy (211). Deletions of the long arm of chromosome 5 (del(5q)) are the most frequent chromosomal abnormality in de novo MDS.

The International Prognostic Scoring System (IPSS) applies only to de novo MDS. This scoring system assigns a "risk category" for risk for death or transformation to AML. These risk categories reflect the percentage of bone marrow blasts, number of cytopenias, and presence or absence and type of chromosomal abnormalities. The chromosomal abnormalities, which are used to assign risk, are defined by the IPSS as

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