微小残存病変評価方法と臨床的意義

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KEY WORDS

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●マルチパラメーターフローサイトメトリー
●次世代シークエンサー

Abstract

Novel therapeutic drugs such as proteasome inhibitors and immunomodulatory drugs can dramatically improve response rates and the prognoses of patients with multiple myeloma (MM). However, most patients with MM are considered to be incurable, and relapse owing to minimal residual disease (MRD) is the main cause of death among these patients. Therefore, the assessment of MRD becomes essential to predict prognoses of patients with MM. In this review I will describe the specific features of MRD monitoring methods : multiparameter flow cytometry (MFC), allele-specific oligonucleotide-polymerase chain reaction (ASO-PCR), and next-generation sequencing (NGS). Although a molecular complete response (CR) in MM can be assessed by ASO-PCR, this technique requires preparation of clonotype-specific primers for each individual, which is laborious and time-consuming. A sequencing method employs consensus primers and NGS to amplify and sequence all rearranged immunoglobulin gene segments present in a myeloma clone. This technique has been shown to have 1-2 logs greater sensitivity compared with ASO-PCR (sensitivity is 10^{-5}) and conventional MFC (sensitivity is 10^{-4}), respectively. Recently, the next generation flow (NGF) -MRD approach was developed by the EuroFlow Consortium and the International Myeloma Foundation (IMF) for detection of MRD in MM. This new method provides a fast, highly applicable, ultrasensitive (sensitivity is 10^{-6}), standardized and accurate approach for the assessment of MRD.

Prognostic value of minimal residual disease response assessment in multiple myeloma.
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