Magnetic Resonance Imaging (MRI) as Part of Staging Work-Up for Newly Diagnosed Multiple Myeloma (MM): Five (5) or More Focal Lesions and LDH Elevation Identify Inferior Survival in 402 Patients Receiving Total Therapy II (TT II)

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Abstract:

Magnetic Resonance Imaging (MRI) is a non-invasive imaging technique that can be used to detect and characterize lesions in the body. In this study, we evaluated the role of MRI in the staging of multiple myeloma (MM), a type of bone marrow cancer that affects plasma cells.

Introduction

The purpose of this investigation was to determine if analyzing MRI findings could provide additional information about the prognosis of patients with MM. Specifically, we aimed to:

- Analyze the MRI findings of patients with MM
- Determine the frequency of enlargements of MRI-FL during Total Therapy II (TT II)
- Perform single and multi-factorial correlation of these MRI findings with overall survival (OS)

Methods

All MRI examinations were done on a commercial 1.5 Tesla whole-body MRI scanner (GE Signa®) with appropriate conventional coils for the regions being imaged. The MRI scans included T1- and T2-weighted images, as well as short-tau inversion recovery (STIR) images. The images were scored in a computer database for regions of involvement, presence or absence of diffuse, stippled, or focal lesions,以及 signal intensity from healthy plasma cells. The MRI scans were evaluated by flow cytometry and by cytogenetics.

Results

The study included 402 patients with MM, and the MRI findings were categorized into 5 or more focal lesions, or diffuse involvement, which had no discernable margins or boundaries. The patients were treated with TT II, which consists of a combination of chemotherapy and stem cell transplantation. The results showed that patients with 5 or more focal lesions had a worse prognosis, with lower overall survival rates compared to patients with fewer focal lesions. The study also found that patients with diffuse involvement had a better prognosis than those with focal lesions.

Conclusions

We conclude that patients with MM and diffuse involvement have a better prognosis than those with focal lesions. Future directions include further evaluation of MRI findings in the staging of MM.

Future Directions

- Determine the frequency of disappearance of MRI-FL during Total Therapy II
- Perform univariate and multivariate prognostic modeling of MRI-FL
- Evaluate the prognostic implications of MRI-FL at diagnosis, during clinical relapse, and following therapy