The benefit of using whole-body, low-dose, nonenhanced, multidetector computed tomography for follow-up and therapy response monitoring in patients with multiple myeloma

Marius Horger, Lothar Kanz, Barbara Denecke, Reinhard Vonthein, Philippe Pereira, Claus D Claussen & Christoph Driessen

BACKGROUND: The objectives of this study were to assess the status and clinical course of patients with multiple myeloma based on the direct visualization of changes in medullary, extramedullary, and focal osteolytic myeloma involvement by using whole-body, low-dose, multidetector computed tomography (WBLD-MDCT) and to compare those results with an assessment based on conventional hematologic parameters.

METHODS: Between June 2002 and December 2005, WBLD-MDCT scans were obtained from 131 consecutive multiple myeloma patients with or without therapy, resulting in a total of 439 examinations. The number and size of osteolytic lesions and the number, size, and density of focal or diffuse medullary and extramedullary lesions were analyzed. Those results and the results at follow-up were related to current laboratory tests for myeloma. Validation was achieved by the combined reading of both hematologic and radiologic parameters at follow-up.

RESULTS: Association between both diagnostic modalities was assessed by using European Group for Blood and Marrow Transplantation response criteria, resulting in an agreement of kappa = 0.70. Hematologic parameters proved correct in 84% of all examinations, whereas WBLD-MDCT resulted in correct assessment in 94% of all examinations. Among 91 of 439 examinations that produced discrepant findings (21%), WBLD-MDCT proved correct in 68 of 91 examinations (75%), as determined at further follow-up (95% confidence interval, 66-83%; P = .000003; sign test). The combination of WBLD-MDCT with conventional, laboratory-based follow-up resulted in significantly greater diagnostic accuracy compared with laboratory testing alone.

CONCLUSIONS: The results from this study indicated that WBLD-MDCT represents a reliable, imaging-based method for the direct monitoring of the course of patients with myeloma under specific therapy, and it showed good concordance with established hematologic parameters. It is noteworthy that, in the current investigation, WBLD-MDCT proved to be even more reliable than conventional, laboratory-based follow-up.
type: journal paper/review (English)
date of publishing: 15-4-2007
journal title: Cancer (109/8)
ISSN print: 0008-543X
pages: 1617-26