

LETTER TO THE EDITOR

Significant increase in end-stage renal disease after hematopoietic stem cell transplantation

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Chronic renal failure (CRF) after hematopoietic stem cell transplantation (HCT) is a well-acknowledged complication of HCT.^{1,2} Its most severe consequence is end-stage renal disease (ESRD), which requires dialysis or kidney transplantation to sustain life. We report herein the very high age-adjusted risk of ESRD after HCT.

Acute renal failure, occurring usually within the first 30 days after HCT, is associated with neutropenic sepsis and use of nephrotoxins.³ CRF has been linked to both chemo-irradiation conditioning and chronic graft-versus-host disease.^{4,5} A very recent report documented its occurrence in 23% of long-term HCT survivors.⁶ In this study, CRF was defined as chronic kidney disease, with a calculated glomerular filtration rate (GFR) of <60 ml/min (normal is 80–120). This report did not provide information on the exact level of GFR in their cases. Reduction in GFR to lower levels may be more significant than only modest reductions in GFR.

Scattered reports have documented progression of CRF after HCT to ESRD. In an earlier report, we documented the relationship of CRF after HCT to irradiation, and termed this entity 'bone marrow transplant nephropathy'.¹ Four of these subjects had evolved to the need for long-term dialysis. Survival on dialysis after HCT is poor.⁷ Kidney transplantation is possible, yet can only proceed if the recipient is medically suitable. The cost of dialysis or transplantation is very high. There are no published data on the frequency of ESRD after HCT. We therefore analyzed the data from our center, and compared the occurrence of ESRD in this cohort with national and state data.

Of 1341 HCT carried out in adults at our center since 1985, 19 have developed ESRD. Of these, 13 have required long-term dialysis, and eight have undergone kidney transplantation. The median time from HCT to ESRD was 7 years. Of these, 13 had BMT nephropathy, and six had ESRD of uncertain origin. In the entire cohort of 1341 patients, the median age was 47 years, the male to female ratio was 46–54 %, and 88% were Caucasian.

In the United States, the gender adjusted expected incidence rate of ESRD in Caucasians is 161 per million in the 40–49 age range.⁸ The general population ESRD rate for the state of Wisconsin is not different from that of the United States as a whole. We calculated the expected rate of ESRD in our cohort of 1341 subjects. We estimated the person-years at risk to be 7453 by taking into account the year the BMT was carried out, and by assuming that 30%

died or were lost to follow up at 1 year after BMT, a percentage that increased to 50% at 2 years and was stable thereafter. This is a conservative estimate, because some cases of ESRD might have been missed due to incomplete follow-up, and because we are assuming no mortality or loss to follow-up after 2 years. Thus, the expected number of ESRD cases was 1.2 in our cohort of 1341. The actual occurrence of 19 cases is 16 times the expected rate of ESRD. This rate far exceeds the relative risk of solid cancers following HCT, for which the observed to expected ratio is 2.7.⁹

Estimating the current number of HCTs worldwide to be over 20 000 per year, it may be expected that hundreds of people per year develop ESRD as a complication of HCT. This number is consistent with ongoing recent reports of CRF and ESRD after HCT from centers worldwide.¹⁰

Treatment of CRF after HCT may slow progression to ESRD. Further definition and study of chronic kidney disease after HCT is needed in order to improve our recognition and treatment of this devastating complication.

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