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Title Immunological Changes after Cancer Treatment and Participation in an Exercise Program.[Article]

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Abstract HAYES, S. C., D. ROWBOTTOM, P. S. W. DAVIES, T. W. PARKER, and J. BASHFORD. Immunological Changes after Cancer Treatment and Participation in an Exercise Program. *Med. Sci. Sports Exerc.*, Vol. 35, No. 1, pp. 2-9, 2003.

Purpose: The purpose of this investigation was to evaluate the impact of undertaking peripheral blood stem cell transplantation (PBST) on T-cell number and function, and to determine the role of a mixed type, moderate intensity exercise program in facilitating the recovery of T-cell number and function.

Methods: Immunological measures of white blood cell, lymphocyte, CD3+, CD4+, and CD8+ counts, and CD3+ cell function were assessed pretransplant (PI), immediately posttransplant (PII), and 1 month (I1), 2 months (I2) and 3 months (PIII) posttransplant. After PII, 12 patients were divided equally into a control group (CG) or exercise intervention group (EG).

Results: Lower total T-cell, helper T-cell, and suppressor T-cell counts ($P < 0.01$), as well as lower T-cell function ($P < 0.01$), when compared with normative data, were found at PI. More specifically, 88% of the group had CD3+, CD4+, and CD8+ counts that were more than 40%, 20%, and 50% below normal at PI, respectively. Undertaking a PBST caused further adverse changes to the total leukocyte, lymphocyte, CD3+, CD4+ and CD8+ count, and the helper/suppressor ratio. Although CD8+ counts had returned to normal by PIII, CD3+, CD4+, and the CD4+/CD8+ ratio remained significantly lower than normative data ($P < 0.01$), with 66%, 100%, and

100% of the subject group reporting counts and ratios, respectively, below the normal range.

Conclusion: The PBST patients were immunocompromised before undertaking the transplant, and the transplant procedure imposed further adverse changes to the leukocyte and lymphocyte counts. The leukocyte and CD8+ counts returned to normal within 3 months posttransplant; however, the other immunological parameters assessed demonstrated a delayed recovery. Although participation in the exercise program did not facilitate a faster immune cell recovery, neither did the exercise program hinder or delay recovery.

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