The Role of Follicle-Stimulating Hormone in Vascular Dysfunction Observed in Hematopoietic Cell Transplant Recipients

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Abstract

Background: Childhood cancer survivors (CCS) who receive a hematopoietic cell transplantation (HCT) are at increased risk for follicle-stimulating hormone (FSH) and luteinizing hormone (LH) abnormalities, which may have a substantial negative impact on vascular function. This study's purpose was to examine the association of vascular function with FSH and LH in HCT recipients, non-HCT recipients and healthy controls. Procedures: The study included CCS who were HCT recipients (n=24) and non-HCT recipients (n=308), and a control group of healthy siblings (n=211) all aged between 9-18 years. Vascular measures of carotid artery structure and function (compliance and distensibility), brachial artery flow-mediated dilation (FMD) and nitroglycerin-mediated endothelial-independent dilation (EID) were measured using ultrasound imaging. FSH, LH, testosterone (males only), and estrogen (females only) were measured from a fasting blood sample. Results: FSH was significantly higher in HCT recipients compared to non-HCT recipients and healthy controls ($p<0.01$). The groups did not differ significantly for LH, testosterone, or estrogen. Carotid compliance and distensibility were significantly lower in HCT and non-HCT recipients compared to healthy controls ($p<0.05$). FMD and EID did not differ significantly between groups. Higher FSH was associated with decreased carotid compliance ($p<0.05$). Higher testosterone was associated with lower EID ($p<0.05$). Conclusion: This study's results suggest that higher levels of FSH in HCT recipients may result in significant reductions in vascular function compared to non-HCT recipients and healthy controls. Therefore, endocrine dysfunction, particularly abnormal FSH levels, may be an underlying mechanism of vascular dysfunction.

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