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Are heart transplant recipients more likely to develop skin cancer than kidney transplant recipients?

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Abstract Non-melanoma skin cancer is frequent in organ transplant recipients. The risk of posttransplant cutaneous squamous cell carcinoma in Norwegian heart transplant recipients (n = 148) and kidney transplant recipients (n = 1020) on triple immunosuppressive therapy with cyclosporine, azathioprine, and prednisolone, transplanted between 1983 and 1992, were studied. After adjustment for age at transplantation in multivariable Cox models, heart transplant recipients had a significantly 2.8-times higher risk of developing squamous cell carcinoma relative to kidney transplant recipients. The risk relative to the general population (standardized incidence ratio) was higher in heart transplant recipients than in kidney transplant recipients. The results indicate that heart transplant recipients are more likely to be diagnosed with skin cancer than kidney transplant recipients, probably due to the higher doses of cyclosporine and azathioprine after heart transplantation used at our center in the study period.

Key words Squamous cell carcinoma · Heart transplant · Kidney transplant

Introduction

It is well documented that kidney transplant recipients are at increased risk of non-melanoma skin cancer, especially squamous cell carcinoma [1]. There are few reports on skin cancer in heart transplant recipients, of which some have indicated that heart transplants recipients are more likely to develop skin cancer than renal transplant recipients [2].

Materials and methods

All 148 heart transplant recipients and 1020 kidney transplant recipients transplanted at Rikshospitalet, Oslo from 1983 through 1992 were studied. All patients received triple immunosuppressive therapy with cyclosporine, azathioprine, and prednisolone. Retransplanted patients were not included in the study. Median age at transplantation was 51.6 years in the heart transplant group and 49.2 years in the kidney transplant group. Recipients with cutaneous squamous cell carcinoma were identified by linkage to the Cancer Registry of Norway.

Potential risk factors for posttransplant squamous cell carcinoma were estimated in multivariable Cox models with age at transplantation categorized as < 40, 40–49, 50–59 and ≥ 60 years. The incidence of squamous cell carcinoma was compared with that in the general population by calculating the ratio between the observed number of transplant recipients with posttransplant squamous cell carcinoma and the expected number on the basis of age-, calendar period-, and gender-specific rates in the general population (standardized incidence ratio; SIR). Differences between SIRs in subgroups were evaluated using χ^2 tests for equity. In statistical comparisons, P values < 0.05 were considered significant. The study was approved by the Regional Committee of Medical Research Ethics.

Results

The observed number of recipients with one or more posttransplant squamous cell carcinoma was 9 among the 148 heart transplant recipients and 29 among the

1020 kidney transplant recipients. After adjustments for age at transplantation in Cox models, patients with a heart transplant had a significantly 2.8 times higher risk (95% CI 1.2–6.7) of being diagnosed with squamous cell carcinoma relative to those with a kidney transplant. Other clinical and immunological factors were not found to be risk factors or confounders.

SIR for squamous cell carcinoma in heart transplant recipients was 177 (95% CI 81–336) vs 49 (95% CI 33–70) in kidney transplant recipients ($P < 0.001$). For recipients 40–60 years old at transplantation, SIR was 155 (95% CI 62–319) in those with a heart transplant and 66 (95% CI 28–130) in those with a kidney transplant ($P = 0.16$).

Discussion

The risk for posttransplant skin cancer in kidney transplant recipients increases with the degree of immunosuppression achieved by the immunosuppressive therapy [3, 4]. In the study period, higher doses of cyclosporine and azathioprine were given after heart transplantation compared to after kidney transplantation at our center. This could explain why heart transplant recipients are more likely to be diagnosed with post-transplant cutaneous squamous cell carcinoma than are kidney transplant recipients. It is possible, however, that heart transplant recipients were more closely followed clinically than kidney transplant recipients were (surveillance bias).

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