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Determinants of Early Post-Transplant Persistence of Shingrix-Induced gE-Specific T-Cell Immunity in Kidney Transplant Recipients

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Objectives : Kidney transplantation (KT) recipients are vulnerable to infections, particularly during the first post-transplant year. Although pre-transplant vaccination with recombinant zoster vaccine (RZV; Shingrix) is recommended, the durability and determinants of vaccine-induced cellular immunity in the early post-KT period remain unclear.
Methods : We enrolled 59 living donor KT patients: 39 received Shingrix, 10 received live-attenuated vaccine (Zostavax), and 10 were unvaccinated controls. ELISpot assays targeting glycoprotein E (gE; Shingrix-specific antigen) and immediate early protein 63 (IE63; variceela-zoster virus wild-type antigen) were performed before KT and at 3 months post-KT using background-subtracted net spotforming cell (SFC) counts. Within the Shingrix group, subgroup analyses were performed by desensitization status and induction type.
Results : Across groups, gE net SFC at baseline and 3 months post-KT did not significantly differ (baseline p=0.1765; 3 months p=0.8304), and change from baseline (delta) was also comparable (p=0.4046). In the Shingrix group, gE-specific T cell responses were maintained from pre-KT to 3 months post-KT (median 9.5 to 18.5 SFC, p=0.0818), indicating persistence of vaccine-induced gE-cell mediated immunity during early post-transplant immunosuppression. Baseline ELISpot strongly predicted 3-month responses in Shingrix recipients (gE rho=0.622, p<0.001; IE63 rho=0.717, p<0.001), but not in controls or Zostavax. Basiliximab (vs ATG) induction was associated with higher 3-month gE responses (median 49.0 vs 9.0; p=0.0022), delta gE (21.0 vs -3.0; p=0.0102), and gE ratio (2.1 vs 0.6; p=0.0090). Responder analysis confirmed more frequent gE maintenance under basiliximab than ATG (75.0% vs 26.7%, p=0.0069). Desensitization was not significantly associated with gE persistence. In multivariable analysis, younger age was associated with greater preservation of gE responses (per year: -2.579 for delta gE; p=0.022), supporting an age-dependent gradient in early post-KT cellular immunity.
Conclusions : Pre-transplant Shingrix vaccination maintains gE-specific T-cell immunity at 3 months post-KT, with baseline ELISpot levels, basiliximab induction (vs ATG), and younger age as key determinants.