To determine whether daily intake of 1alpha,25-dihydroxyvitamin D3 (1,25(OH)(2)D3) is safe and improves beta-cell function in patients with recently diagnosed type 1 diabetes. Safety was assessed in an open study of 25 patients aged 18-39 years with recent-onset type 1 diabetes who received 0.25 microg 1,25(OH)(2)D3 daily for 9 months. An additional 40 patients were randomly assigned to 0.25 microg 1,25(OH)(2)D3 or placebo daily for 9 months and followed for a total of 18 months for safety, beta-cell function, insulin requirement, and glycemic control. Safety assessment showed values in the normal range in nearly all patients, regardless of whether they received 1,25(OH)(2)D3 or placebo. No differences in AUC C-peptide, peak C-peptide, and fasting C-peptide after a mixed-meal tolerance test between the treatment and placebo groups were observed at 9 and 18 months after study entry, with approximately 40% loss for each parameter over the 18-month period. A1C and daily insulin requirement were similar between treatment and placebo groups throughout the study follow-up period. Treatment with 1,25(OH)(2)D3 at a daily dose of 0.25 microg was safe but did not reduce loss of beta-cell function.