

Publication

Alterations in insulin clearance and hepatic blood flow during the night do not contribute to the "dawn phenomenon" in type 1 diabetes

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To assess mechanisms leading to the 'dawn phenomenon' in type 1 diabetes mellitus, overnight insulin clearance, hepatic blood flow and insulin sensitivity of glucose metabolism were determined in 9 type 1 diabetic subjects treated with continuous subcutaneous insulin infusions. Glucose clamp studies were performed twice, once after midnight (from 24.00 to 02.00 h), and once in the early morning (from 06.00 to 08.00 h) during insulin infusion at 15 mU/m2/min. Insulin clearance was 482 +/- 57 ml/m2/min during the first, and 528 +/- 56 ml/m2/min during the second clamp (nonsignificant). Hepatic plasma flow assessed by measuring indocyanine green clearance was 984 +/- 115 and 1,040 +/- 163 ml/min, after the first and after the second clamp, respectively (nonsignificant). Glucose uptake during the two clamps was not significantly different. Since hepatic blood flow is known to influence insulin clearance and hepatic glucose metabolism, the data demonstrate that overnight changes in hepatic blood flow and insulin clearance do not contribute to the previously described early morning increase in insulin requirements in type 1 diabetic subjects (dawn phenomenon).

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