Summary

A technique for measuring glucose uptake in the small intestine of rabbits was developed. Using this technique, the glucose uptake in the resting jejunum of rabbits and the effect of nicotine infusion on glucose uptake were studied. Experiments were carried out on fasted anaesthetized male rabbits. Four groups of rabbits (6 per group) were studied. A vein draining segment of the upper jejunum was cannulated for blood flow and venous glucose measurements. The left femoral artery and vein were cannulated for arterial blood sampling and drug fusion respectively. Glucose uptake was calculated as a product of jejunal blood flow and the (A-V) glucose difference. The fasting blood glucose levels were 101.0±8.4 mg/dl and 127.0 ±11.3 mg/dl before and after anesthesia respectively. Basal blood glucose was much higher than this following surgery. The upper jejunum had a resting glucose uptake of 24.1+7.0 mg/min. When nicotine (50ug/kg) was infused intravenously, blood glucose rose from a basal value of 253.8±9.5 mg/dl to 379.8±20.3 mg/dl at the peak of response. Glucose uptake increased to 73.1 + 11.3 mg/min at the peak of response. These effects of nicotine are mediated through both beta and alpha adrenoceptors. Comparison with previous studies in dogs and rats showed that different adrenoceptors are involved in nicotine hyperglycaemia in fasted dogs, rats and rabbits.