

Abstract

Both production and secretion of insulin depend on the circadian rhythms. These are set by the internal circadian clock reacting to the external stimuli such as the light or the darkness. The central clock synchronization of the rhythmic processes in the organism is formed by the structure so-called suprachiasmatic nucleus. Secretion of melatonin, aka “hormone of the night,” is controlled by the central clock and serves to align them with the peripheral clocks. Peripheral clocks are located, for example, in pancreas, liver or other body organs. Langerhans’ islets in pancreas consist of α -, β - and γ -cells. These play an important role in maintaining glucose homeostasis as they produce hormones insulin and glucagon, key blood glucose level regulators.

This text describes how the corruption of circadian system by a light pulse at night impacts insulin secretion. A phase shift results in melatonin secretion anomaly (increase), which inhibits insulin levels and thus gives rise to elevated glucose levels. Hyperglycaemia and insulin resistance because of a long-term rhythm corruption may result in type 2 diabetes.

Key words: circadian rhythm, SCN, melatonin, MT1 receptor, MT2 receptor, β -cell, insulin, glucagon, insulin resistance, type 2. diabetes