

Abstract

The primary purpose of this pilot study was a long-term monitoring of the gut microbiome composition and fecal markers of metabolism in rats following the completion of 10-day intraperitoneal administration of increasing morphine doses (from 10 to 50 mg/kg/day) and in the corresponding control groups of rats that didn't administrate morphine. This study involved the introduction of new methods for microbiome and metabolome research, statistical evaluation of results and interpretation of data, or hypothesis to explain the effects of morphine on the gut microbiome and fecal metabolome composition compared to the resulting data of similarly oriented studies. The actual experiment was conducted on male Wistar rats aged 2 months and weighing approximately 300 g, which were maintained on a standard chow diet.

The analysis and evaluation of the resulting data showed that there were changes in the composition of the gut microbiome and fecal metabolome in the experimental group compared to the control group during the reporting period but the induced changes were rather temporary. Further studies should be performed using a significantly larger experimental and control group as well as higher time series granularity.

Keywords: morphine, opioids, withdrawal, gut microbiome, faecal metabolome