

ABSTRACT

Imbalance in gut microbiota leads to a very important metabolic disease known as obesity. It is a disease of modern era and reaching an alarming stage in current population. This study aims at highlighting the significance of high fat diet and gut microbiota in development of obesity in mice. From 10 fecal samples of obese patients, 18 morphologically different strains were isolated and characterized biochemically. Most abundant biochemically identified genera were *Lactobacilli*, *Clostridia* and *Staphylococcus*. *In vivo* study using these strains alone and combined with HFD in mice was performed for three months by dividing mice into four groups *i.e.* group 1 mice fed with chow served as control, group 2 mice fed with HFD, group 3 mice with gut microbiota + HFD and group 4 mice with bacterial inoculum + normal chow diet. Feeding HFD, HFD + gut microbiota and chow diet + gut microbiota caused significant elevation increase (ANOVA; $p \leq 0.01$) in levels of cholesterol, triglycerides, LDL and VLDL compared to chow diet. However, body weight (BMI; Kg/m^2) only increased in mice fed with HFD + gut microbiota. In conclusion, results of this study suggested that gut microbiota play important role in obesity, an example of metabolic disease. Additionally, choice of diet can dissociate broad changes in microbiota composition thus influencing the host physiology. Understanding the relationship between diet influenced gut microbiota and host has broad implication and is of utmost interest to design effective preventive strategies to overcome autoimmune and other associated metabolic diseases. And thus, raising questions about the previously proposed relationship between gut microbiota and obesity.