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Are there significant differences in the gut microbiome of East Kent patients before and after they undergo cholecystectomy in the last year? A Prospective Cohort Study.

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Abstract

Background: The role of the gut microbiome in gallstone disease remains a growing area of research. Previous research into this area includes small scale studies but the current knowledge of specific microbial species and functional pathways leading to gallstone disease is still limited. Since gallstone disease remains a significant problem in the NHS, leading to debilitating symptoms and partially caused by environmental and social factors, which continue to become more challenging in the UK, this research aimed to address this area of concern. This type of research could potentially lead to microbial dysbiosis becoming a recognised risk factor for gallstone disease and being considered when formulating management plans for patients.

Methods: The methods used for this study involved obtaining stool samples from patients scheduled for cholecystectomy, samples from the same patients after cholecystectomy as well as six months after cholecystectomy. The DNA extraction protocol included with PureLink Microbiome DNA Purification Kit was followed to extract and purify microbial DNA from these samples. This purified DNA underwent PCR to amplify the amount of 16S microbial DNA before undergoing gel electrophoresis to verify the presence of bacterial DNA. The DNA was then sent for sequencing and statistical analysis using Muther and QIIME2 software was used to investigate patterns in the results.

Results: The results showed values of DNA concentrations from the extraction products as well as a comparison of DNA concentration values at three different time points: before, after and 6 months after cholecystectomy. They revealed a high degree of variability in these values. The results also show the change in DNA yield across the three time points and a comparison of the DNA yield before and after using Phosphate-Buffered Saline (PBS) to optimise the DNA extraction protocol, as well as a figure showing a gel.

Conclusions: This figure demonstrated the presence of 16S DNA, demonstrating that the DNA extraction was successful.

Keywords: Gut microbiome} | Gallstone disease | Stool samples | DNA extraction |

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